



Washington State

Road Usage Charge Assessment

Final Report



vol. 3 // appendices

WSTC Final Report // **January 2020**





appendices

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A-1

SMARTPHONE INNOVATION CHALLENGE REPORT

 **WA RUC**

UNIVERSITY *of* WASHINGTON



WASHINGTON ROAD USAGE CHARGE

SMARTPHONE INNOVATION CHALLENGE



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INTRODUCTION

The Washington Road Usage Charge Pilot Project (WA RUC) is a proposed pay-per-mile charge system that is being considered as a potential future replacement for Washington’s gas tax. The road usage charge would raise transportation revenue for the state in the long term while increasing tax equity among drivers. The pilot project will test whether this strategy makes sense for Washington.

Background

The Washington Legislature has directed the Washington State Transportation Commission (WSTC) and an appointed Steering Committee to investigate the feasibility and potential for a per-mile charge, or road usage charge (RUC), as a potential replacement for the state gas tax.

The WSTC with advice from the Steering Committee have adopted principles and a policy framework to guide development of the RUC system and are ready to move forward with a state-wide pilot. The Steering Committee has also identified 18 policy “parking lot” issues that will be subject to additional policy analysis and legislative direction, if RUC system is implemented at some point in the future.

The year-long pilot project is being funded by a Federal Highway Administration grant (\$3.8M), and anticipates engaging 2,000 volunteers from geographically diverse areas of the state. It will study whether a road-usage tax could be a workable alternative to the gas tax and will test four different methods to measure road-usage, ranging from high-tech to low-tech approaches.

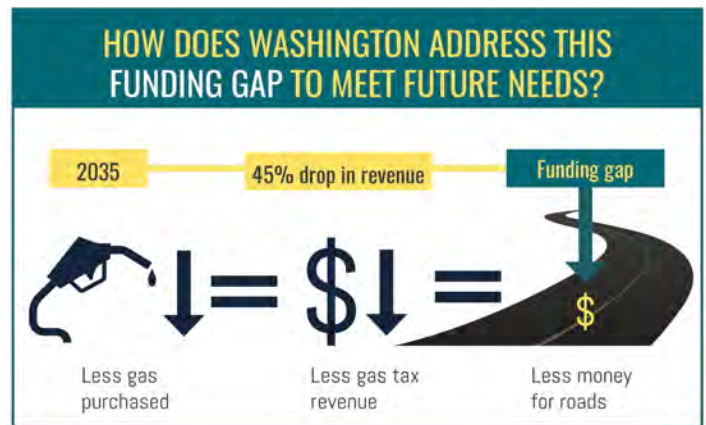


Image credit: waroadusagecharge.org

What is the problem with the Gas Tax?

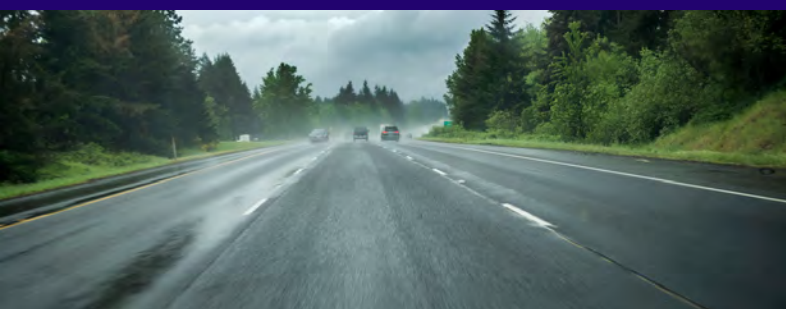
Washington’s gas tax currently funds a large portion of the transportation budget, which pays for maintenance of state highways, ferries, and other infrastructure. As vehicles become increasingly fuel-efficient, gas consumption will continue to decrease; as a result, gas tax revenues will decrease.

Washington currently has a 49.4 cent-per-gallon state gas tax. For every 49.4 cents, after deducting bond repayments and other mandatory distributions to local agencies, only 8 cents are available for use on state highways, bridges, and ferries for maintenance and operations, preservation, and safety improvements. At the same time, a growing percent of the state’s portion of gas tax revenue is required to pay debt service. In fiscal year 2003, 39% of the state’s portion of gas tax revenue went to paying debt service. By fiscal year 2015, this increased to 69%, and by 2027, this is projected to increase to 70%. The gas tax would need to increase by about 1.5 cents per gallon, per year, on all vehicles from 2019-2043 to keep funding at status quo levels.

Fuel efficiency will continue to increase. Washington’s current

THE GOALS OF THE PILOT ARE:

- > Demonstrate an operational RUC
- > Identify and evaluate issues
- > Test the feasibility of the various mileage-reporting options
- > Solicit feedback and ideas



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state average fuel efficiency is 20.5 miles per gallon (MPG), and conservative forecasts suggest that Washington vehicles will reach a 35 MPG average by 2030. The U.S. Energy Information Administration predicts that by 2040, all new cars will have a fuel efficiency of 48 MPG, and fuel efficiency across all cars (new and old) will reach 37 MPG. In addition, electric vehicle usage is growing in Washington, and major auto makers have committed to increase production at a more rapid pace.

There is also an equity (fairness) challenge with the gas tax. Drivers with more fuel-efficient or electric vehicles pay less or no gas tax than drivers with lower MPG vehicles to use Washington's roadways, which means not all state drivers pay equally for use of these roads.

What is a road usage charge?

A road usage charge is a per mile charge that drivers would pay for use of roads, rather than paying by the gallon of gas. It would function similarly to utilities in that people would pay different amounts based on how much they use the transportation system. This pay-per-mile charge system would also create a more

equitable (fair) system for state drivers and a more stable revenue base for reinvestment in the transportation system. Regardless of a car's fuel efficiency, drivers will pay the same tax for driving the same roadway miles.

A road usage charge is different than a toll. A toll is used for specific purposes – either to raise funding for a specific project, such as the SR 520 Floating Bridge or Tacoma Narrows Bridge, or to manage traffic congestion through the pricing of lanes or facilities by charging variable rates at different periods, such as the Express Toll Lanes on I-405 or the HOT Lanes on SR 167. Tolls are only collected when using that specific bridge or road, and revenues are only used to support that facility. In contrast, a road usage charge would replace the gas tax as the primary statewide funding source for transportation needs.

The road usage charge is intended to eventually replace the gas tax. During a transition time when the gas tax and road usage charge would coexist, drivers would pay one or the other but not both. Eventually, the road usage charge would replace the gas tax completely.

THE PILOT PROJECT

In 2012, the Washington State Legislature directed the Washington State Transportation Commission (WSTC) to work with a steering committee in assessing a road usage charge as a possible replacement for the gas tax. After evaluating this potential path for several years, the 25-member Steering Committee and WSTC determined that a road usage charge would be feasible and that it could produce the revenue needed to meet the state's long-term transportation needs.

Starting in early 2018, WSTC will launch a pilot study of the road usage charge with the goal of assessing whether this system fits Washington long-term. This will be a chance for the public to try out the per-mile charge system at no cost to drivers and provide feedback on results to the state and decision-makers.

The project is planning to recruit at least 2,000 drivers throughout the state to participate in the pilot project. The pilot project is funded by a federal grant, and it aims to answer the following questions:

PILOT PROJECT QUESTIONS:

- > Does a road usage charge work for different drivers throughout the state?
- > How do the reporting methods work for drivers?
- > Will a road usage charge enable us to better fund our transportation system in the future?




For the pilot project, the road usage charge is being considered as **a flat rate of 2.4 cents per mile** statewide. This is equivalent to what a driver pays today in gas taxes if the car's fuel efficiency is at the state average of 20.5 MPG.

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Mileage reporting

A key component of the pilot program is that people should be able to choose how they want to report mileage. Volunteers will be able to choose from one of four methods to record and report their mileage, with the methods ranging from no-tech to low-tech to high-tech.

Four reporting options for pilot participants:

		<p>Mileage Permit</p>	<p>Pre-select a block of miles</p>
		<p>Odometer Readings</p>	<p>Report miles quarterly, electronically or in person</p>
		<p>Plug and Play</p>	<p>Automated mileage meter with GPS and non-GPS options</p>
		<p>Smartphone App</p>	<p>Smartphone app is used to collect and report miles</p>

SMARTPHONE INNOVATION CHALLENGE

The Smartphone Innovation Challenge was a sponsored competition designed to improve smartphone approaches for mileage reporting in a road usage charge tax system. The competition asked IT engineers, software developers, and designers to create a prototype solution in the form of an app for mileage reporting using a smartphone. This app should allow drivers to use their own smartphone to record and report mileage, as well as allow drivers to decide whether or when to enable GPS.

From one-day hackathon to extended research opportunity.

The original WA RUC pilot project proposal called for a one-day event inviting talented researchers and software specialists to compete to develop a special smartphone application capable of recording vehicle mileage while allowing all privacy controls to remain with the driver, rather than controlled by the government or a private company.

The original concept for an all-day “hackathon” or “developer codefest” evolved into something bigger.

In discussing the magnitude of the effort required to develop a solution, the project team realized that an all-day competition would not produce the depth of research and results needed for the forthcoming statewide RUC pilot test. Instead, the team began collaborating with **CoMotion**, an organization within the University of Washington that helps public agencies and private firms partner with UW researchers to develop new ideas, services, and products.

The **Mobility Innovation Center**, housed at CoMotion, makes connections between research, technology, and public policy to tackle transportation challenges. With support from CoMotion and the Mobility Innovation Center, the RUC project team assembled and mentored four teams of student researchers across three departments with interest in working on road usage charge smartphone app design, software, and technology.

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What are the challenges of using a smartphone for mileage reporting?

The RUC project team presented the primary challenges with using a smartphone for mileage recording to teams of students.

When discussing options for recording and reporting mileage, drivers often ask whether they can use their own smartphone to keep track of their mileage. They are comfortable with their own phones, have full control over the features, and do not want to install additional equipment just for mileage tax reporting.

There are many software apps already available that record trips. However, road usage charging presents unique challenges that must be addressed.

SMARTPHONE MILEAGE REPORTING CHALLENGES:

- > How can drivers maintain full control over whether (or when) they want to use their phone's GPS for mileage recording?
- > How does the smartphone know when a driver is traveling in the specific vehicle registered with the driver's RUC account?
- > What if a driver forgets to bring (or turn on) the smartphone?
- > Will a special RUC app drain the battery, making the phone unusable during or after the trip?
- > Can a smartphone app do something more interesting and useful than just record mileage?
- > What happens if the vehicle drives into another state? How will the phone know to not add those miles to the driver's RUC account?

Teams worked for six months on their proposed solutions.

The four competing teams worked throughout winter and spring 2017 academic terms, supported by staff from the project team. Project team support included presentation of background materials, advising teams, discussing progress, and identifying and trouble-shooting issues.

Two teams from the UW Human Centered Design Engineering (HCDE) Department participated. Both teams focused on developing a user interface for a Washington RUC smartphone appli-



cation that provides drivers with the type of information they value most, while eliminating information and features that are unimportant or distracting, especially while driving. One team's app focuses on smartphone app design that appeals to the average driver. The other team's app, "Tongle," allows drivers to choose to categorize trips to self-analyze their driving habits, as well as allows drivers to quickly and easily contest their trips and request that a RUC account manager fix any incorrect mileage.

One team from the UW Electrical Engineering (EE) Department participated. They designed a Washington RUC smartphone app for the Android smartphone operating system. This app features a toggle on/off GPS mileage recording to ensure that out-of-state miles are deducted from a driver's RUC account. It also includes Border Proximity Detection, where an audible sound reminds drivers to activate the out-of-state mileage deduction feature as the vehicle approaches a state border. The team made a presentation at the EE department's end of year Capstone Project Fair held on May 30 on the UW Seattle campus. Faculty, students, and guests that attended the Capstone Fair received the project well.

One team from the UW Information School developed a working prototype of a smartphone app for the IOS (iPhone) operating system. The app, "WARUC," uses a simple, "no-look" swipe on the smartphone screen to activate or deactivate mileage reporting. In addition to their formal presentation, the iSchool team created a promotional video that is currently posted to YouTube. This team also received approval to distribute their app through Apple's iTunes App Store.

All four teams completed the Smartphone Innovation Challenge.

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On June 5, 2017, at an event at Fluke Hall on the University of Washington's Seattle campus, the four teams that completed the Smartphone Innovation Challenge presented their designs and smartphone apps to a crowd of approximately 30 invited guests that included project partners and representatives from Challenge Seattle, the Mobility Innovation Center, CoMotion, UW Faculty Advisory Board, WSTC, the Washington State Department of Transportation, the Federal Highway Administration (FHWA), and several consulting firms.

For completing the Challenge and assigning the right to use their designs and smartphone app features in the Washington RUC pilot project, each team earned a Washington RUC Smartphone Achievement award, which includes a financial award of \$5,000.

In addition, two of the teams were tied for the Excellence Award, intended for the team that produced the best overall solution to the challenge of how to use a smartphone for mileage reporting. Because of the tie, two teams split the Excellence Award (\$10,000).

Excellence Award Spotlight

The Human Centered Design & Engineering (HCDE) Team's "Participatory Design" process involved the general public in designing a smartphone app for RUC. HCDE researchers describe their work this way:

"Putting people first, HCD engineers focus on understanding humans needs and interests as they research, design, and build interactions between people and technology."

Rather than starting with technical specifications and software coding, the Participatory Design process used by the HCDE team first assembled a group of volunteers from the public willing to attend three two-hour workshops to help design a smartphone app for mileage reporting. Each of the three workshops had a specific focus.

Workshop 1 consisted of an exercise where volunteers identified and elaborated on all aspects of a RUC smartphone app that they would hate. They sketched out the worst possible solutions they could imagine. By using this negative design process, the team could more vividly contrast the difference in preferences of drivers against the needs of government for collecting RUC.



A high-tech mileage reporting system for use with Washington State's upcoming Road Usage Charge

How can road infrastructure be funded in a more inclusive way?

MEDIA INTEREST: A local Public Broadcasting Station affiliate, KCTS Channel 9, has explored the possibility of running a feature on the unique collaboration between these UW student research teams and government (WSTC, FHWA) as they collaborate to solve a long-term transportation funding problem.

Process

Participatory Design

We sat down with 8 drivers from all over Washington State over the span of workshops to understand and incorporate their perspectives into the design process.

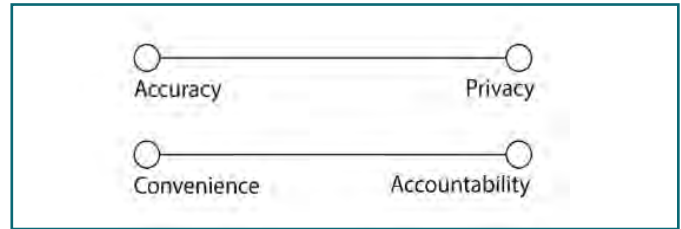
Rapid Prototyping with User Values

Our participants' perspectives revealed a core set of values to be addressed in our designs. Our prototypes sought to effectively address the tensions between those values.

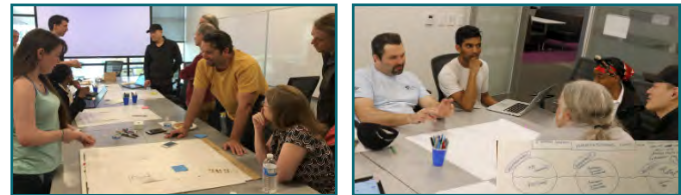


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Workshop 2 began to explore the differences between drivers preferences vs the state’s revenue collection needs, with the volunteers indicating their preferences by level of importance so they could be weighted as priorities. The researchers then took volunteers’ weighted preferences back to the design lab, where they reduced the concepts and preferences into a prototype of a RUC smartphone app that could be used in the Washington pilot project.



Workshop 3 focused on the reactions of the volunteers to the conceptual smartphone app, including an exercise that “truth-tested” the design by dividing the group into two teams, then asking one team to “prosecute” (argue against) the prototype design, and the other team to “defend” the prototype design. These sessions were videotaped and the reactions taken back to the design lab for final adjustments.



Below are snapshots of two projects, Tongle (HCDE) and WARUC (Information School):

Tongle
A high-tech mileage reporting system for use with Washington State's upcoming Road Usage Charge

How can road infrastructure be funded in a more inclusive way?

Problem
Fuel-Efficiency & Gas Tax Revenue
Road Usage Charge
With an increase in average fuel efficiency, funding roads with a gasoline tax is no longer sustainable. Washington State has proposed a per-mile tax based on miles driven, called the Road Usage Charge.

Process
Explore Identify Diverge Validate Prototype Finalize
Workshop 1 Workshop 2 Workshop 3
Participatory Design
Rapid Prototyping with User Values

Prototype
Tongle pairs a smartphone app with an external device to ensure fair and convenient mileage recording. The external device, plugged into a car's OBD-II port, records and stores a car's trip data. The coupled app allows users to view, contest, and pay for their road usage.

- 1) Drive your car**
Tongle requires a convenient, one-time setup for each car
- 2) Record Mileage**
Tongle accurately and automatically records road usage
- 3) Control Privacy**
Tongle protects user privacy by letting users enable GPS for specific trips
- 4) Pay for Trips**
Tongle allows users to pay for their fair share of road usage from their phones
- 5) Store Data**
Tongle allows users to securely access their account data from the cloud

Project by: Shin Young (Lucia) Cho, Molly Fallon, Michael Fernandes, Alex Gilbert
Sponsored by: Washington State Transportation Commission with support from: i2ARTAGRAM Consulting, The Mobility Innovation Center
W HUMAN-CENTERED DESIGN & ENGINEERING UNIVERSITY OF WASHINGTON

WARUC
WASHINGTON ROAD USAGE CHARGE
Bringing our transportation budget up-to-speed with modern vehicles.

PROBLEM
Washington's transportation infrastructure budget is failing. Gas taxes make up 60% of the budget and, without continued increases, will fall behind due to many drivers switching to hybrid or electric vehicles.
Planning ahead, a more adaptable, usage-based, solution is needed.

APPROACH
Utilizing modern Bluetooth and OBD-II technology, our application can unobtrusively track and record mileage information, with no privacy or security issues.
Optimized application to minimize impact on battery, cellular usage, and driving experience.

Records mileage on public roads only
Uses a low-energy bluetooth connection to OBD-II to pair your device with the vehicle and receive trip information
Manual and Automatic Tracking
No location data recorded to ensure your privacy and security

Dylan Babbs, Jackson Brown, Jack Fox, Nick Nordale, & Ishan Saksena
Sponsored by WARUC

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What innovations were carried over to the full WA RUC pilot?

Several features developed through the Smartphone Innovation Challenge will be incorporated into the statewide RUC live pilot test that begins January 2018. The following approaches and features will be forwarded to the technology companies who will become the RUC Service Providers for possible integration and testing in the live pilot:

Application of Participatory Design principles in the development of a user interface for a RUC

Simple, “no-look” swipe on the smartphone screen to activate or deactivate mileage recording

Toggle on/off location-based mileage recording to ensure out-of-state miles are deducted from a drivers’ RUC account

Border Proximity Detection, where audible sounds remind drivers to activate the out-of-state mileage detection feature as the vehicle approaches a state border

“Contest this Trip” feature that allows drivers to view the mileage of recently completed trips to ensure accuracy, and if not, a feature that allows the driver to mark the trip as “contested,” and enter an explanation from a drop-down menu (for example “wasn’t driving my own vehicle”)

User-friendly “explainer” video with simple animation to help explain RUC, and possibly reduce driver apprehension regarding smartphone apps

Simple, clean design to use the smartphone’s camera to snap photo of the odometer as the primary basis for mileage charges, with out-of-state mileage recorded by the phone’s GPS and then deducted from the total mileage.

CONCLUSION

The Smartphone Innovation Challenge provided an opportunity to develop a smartphone mileage reporting application for a road usage charge system. Given drivers’ concerns about privacy and accurate reporting, the Challenge crowdsourced ideas from student researchers to find innovative solutions that would address these challenges. With the support of Challenge Seattle, CoMotion, and the Mobility Innovation Center, the competition brought together student researchers with support and mentorship to develop valuable contributions to the smartphone mileage reporting option. Many of these innovative features will be incorporated into the WA RUC pilot program, helping to reflect drivers’ preferences and needs as a road usage charge system is tested across the state.

Learn more about the Washington Road Usage Charge Pilot Project:

waroadusagecharge.org

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About the Mobility Innovation Center

The University of Washington and Challenge Seattle are committed to advancing our region's economy and quality of life by helping to build the transportation system of the future. Together, they have partnered to create a multi-disciplinary Mobility Innovation Center. Housed at CoMotion at the University of Washington, the Center brings together the region's leading expertise from the business, government, and academic sectors to tackle specific transportation challenges, using applied research and experimentation. Cross-sector teams will attack regional mobility problems, develop new technologies, apply system-level thinking, and bring new innovations to our regional transportation system.

About CoMotion

CoMotion at the University of Washington is the collaborative innovation hub dedicated to expanding the economic and societal impact of the UW community. By developing and connecting to local and global innovation ecosystems, CoMotion helps innovators achieve the greatest impact from their discoveries. We deliver the tools and connections that UW researchers and students need to accelerate the impact of their innovations.

> mic.comotion.uw.edu



A-2

**SURVEY
RESULTS**

 **WA RUC**

APPENDIX

Washington Road Usage Charge Pilot Evaluation: Survey Results

Survey 1 Results

Introduction

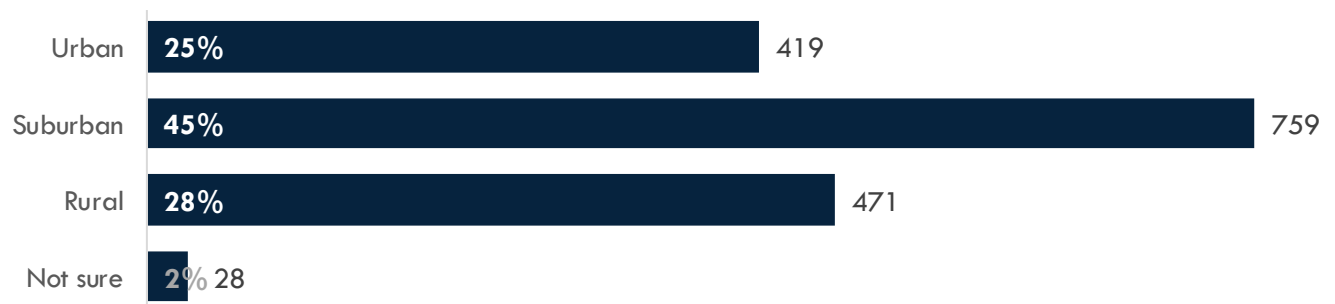
This document summarizes the results of Pilot Participant Survey #1. The survey collected information on participants' driving habits and perspectives, how the pilot is impacting them, and their views on a potential road usage charge system.

For the first survey, 2,048 invitations were sent to pilot participants with 1,709 responses, for a conversion rate of 83%. Because some respondents skipped questions, some questions include a sample size (n) listed next to the question. Some questions were further analyzed based on respondents' answers to where they live or their reporting device.

SURVEY 1 RESULTS

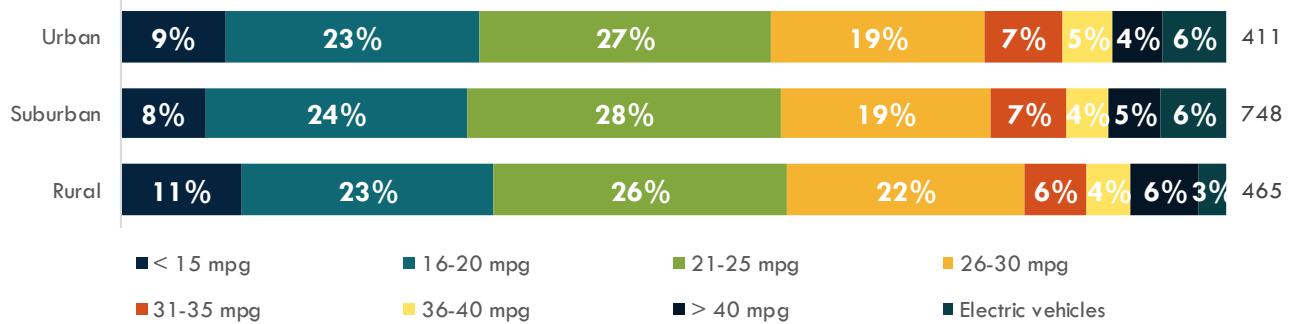
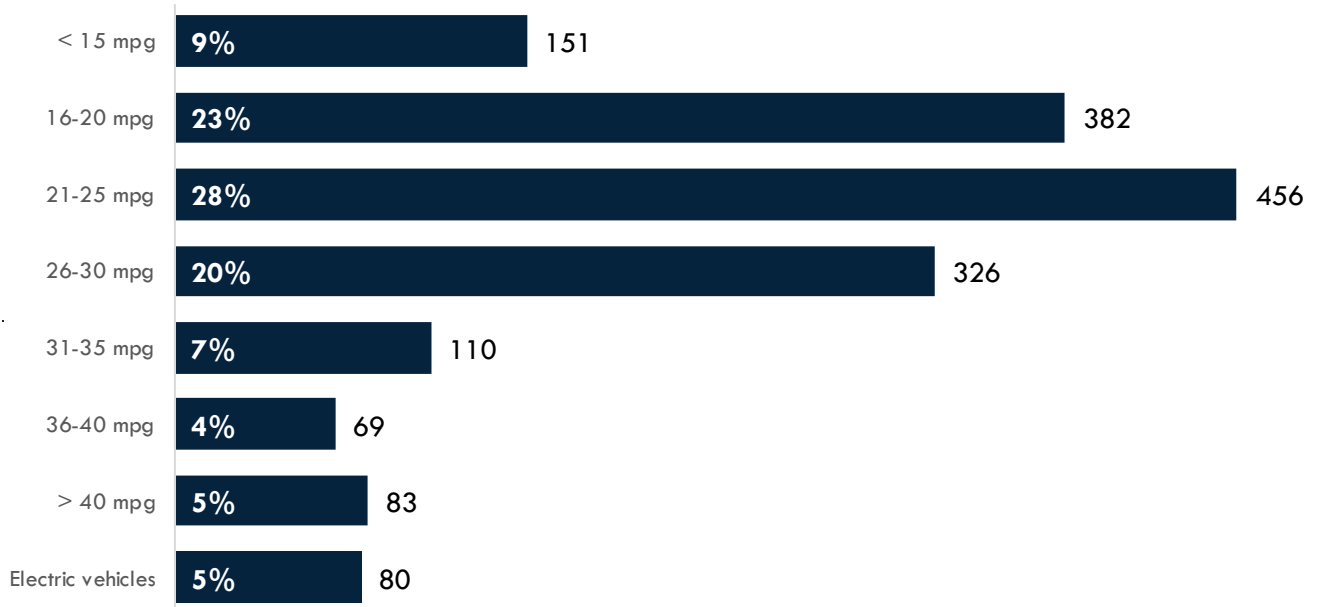
About you and your driving:

1. How would you describe where you live? (n=1,677)



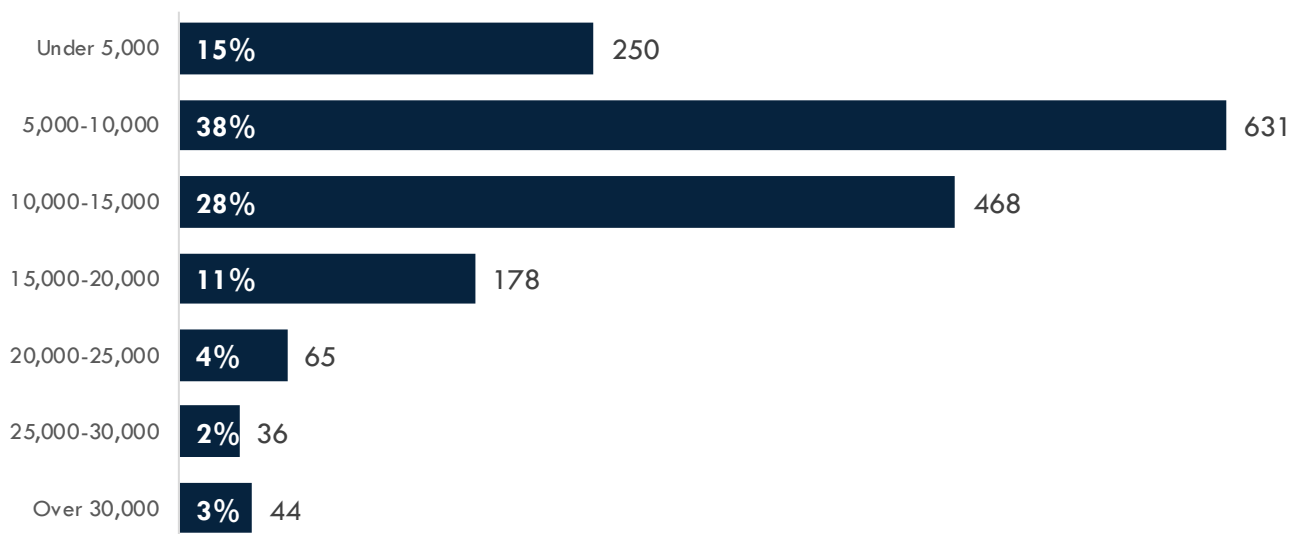
Source: BERK Consulting, 2019.

2. How many miles per gallon would you estimate your vehicle gets? (n=1,657)



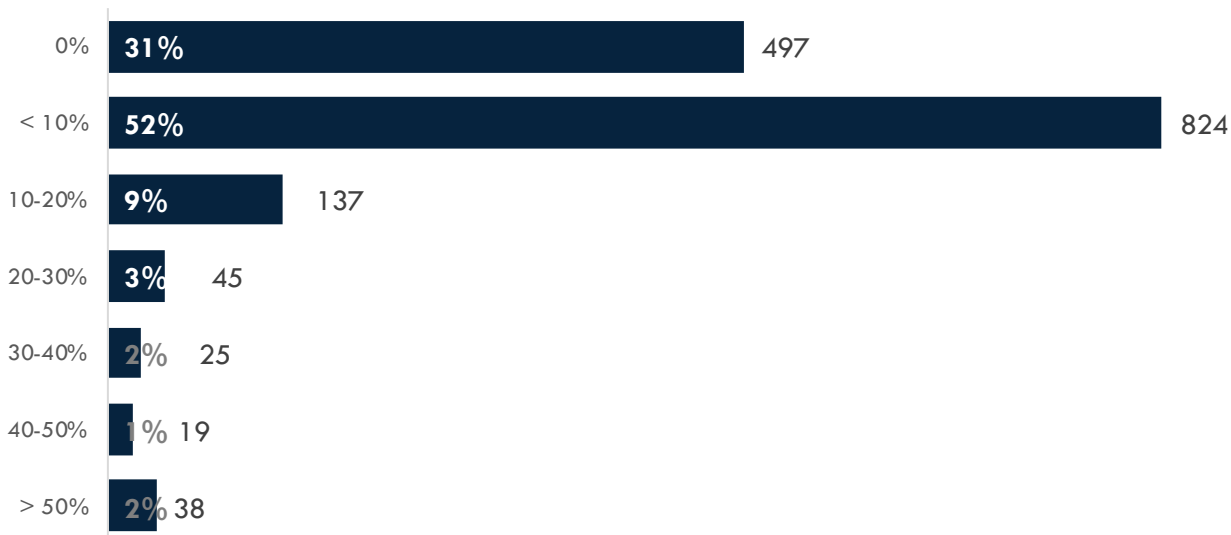
Source: BERK Consulting, 2019.

3. Approximately how many miles do you drive this vehicle each year? (n=1,672)

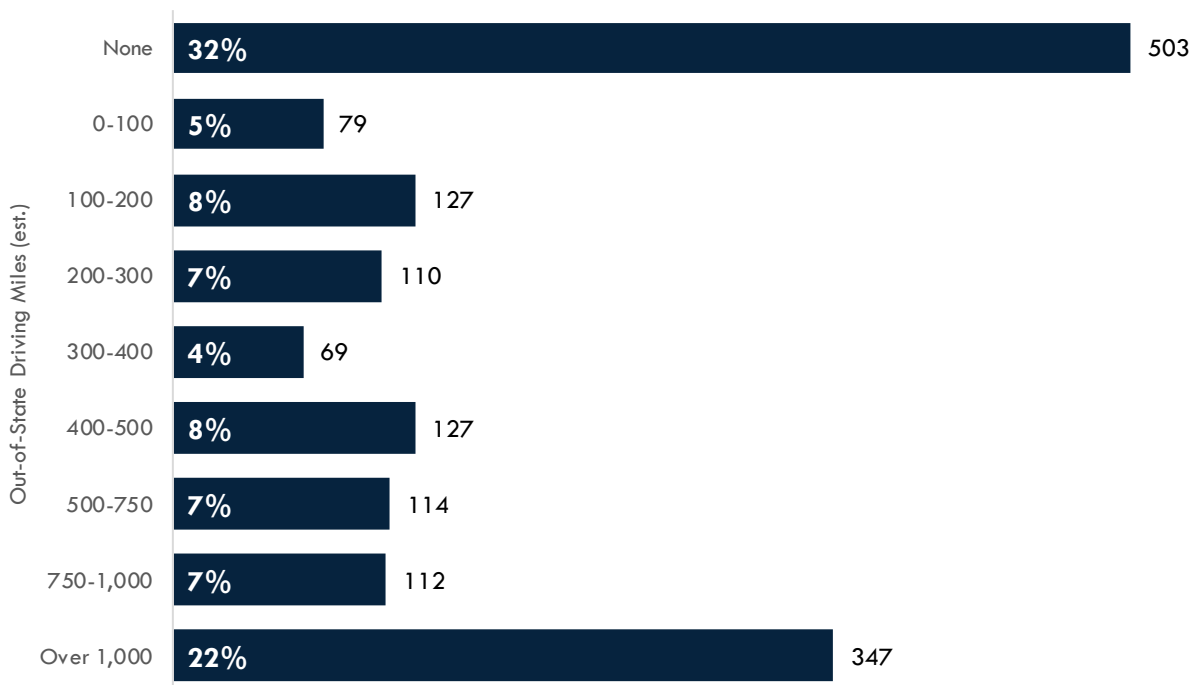


Source: BERK Consulting, 2019.

**4. Of those miles you drive each year, what percent do you estimate you drive out-of-state?
(n=1,585)**



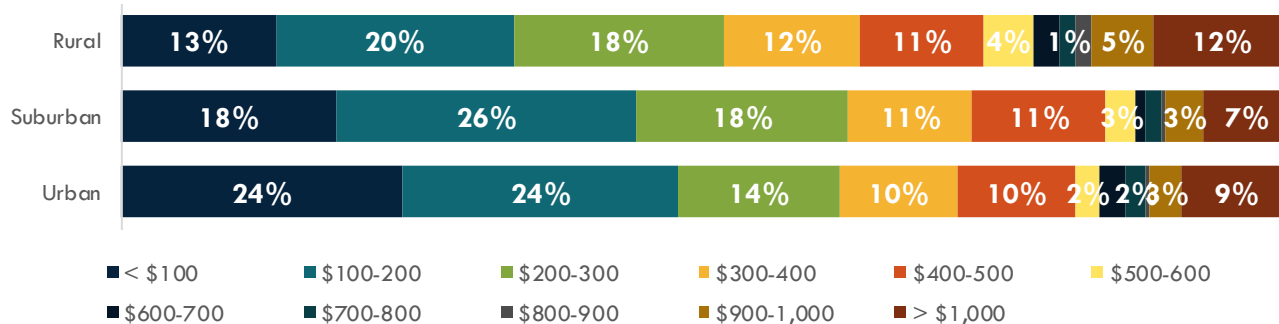
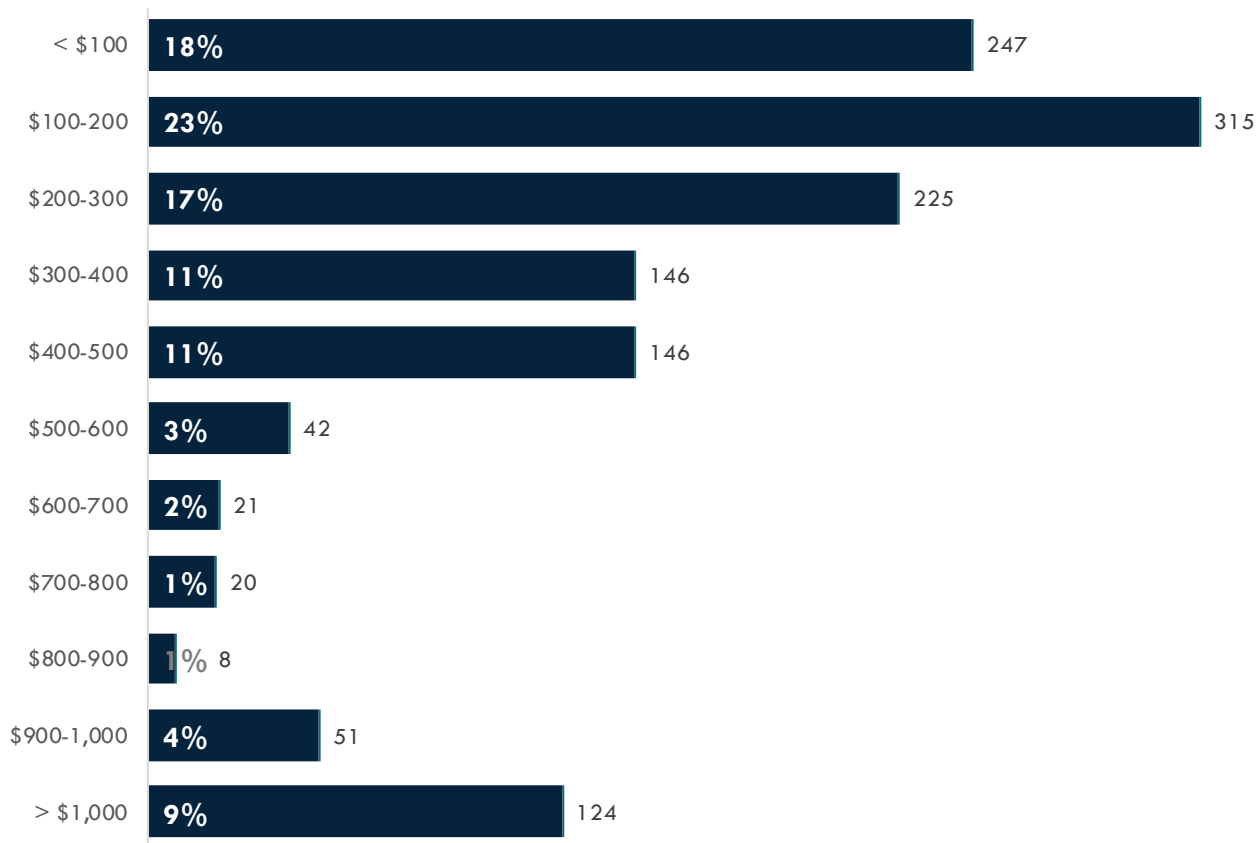
Based on the responses to question three, we calculated ranges for estimated miles driven out of state. Vehicle miles driven per year was multiplied by the estimate of percentage of miles driven out-of-state.



Note: Because two questions were used for the out-of-state driving miles calculation, some respondents answered one or the other question and the results do not fully add up.

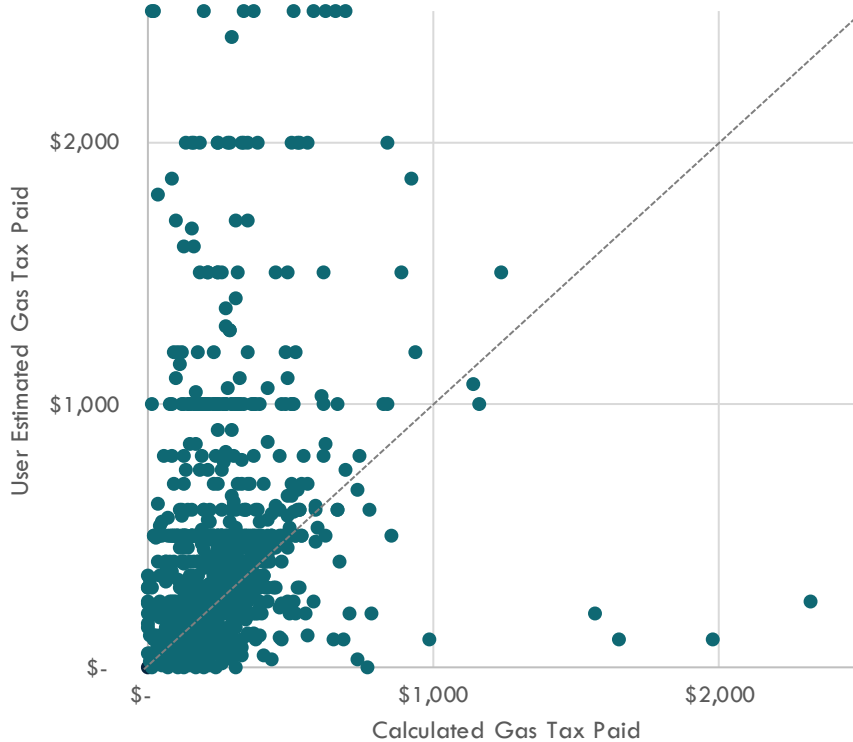
Source: BERK Consulting, 2019.

5. How much would you estimate you pay in state gas tax per year for your vehicle? (n=1,345)



Source: BERK Consulting, 2019.

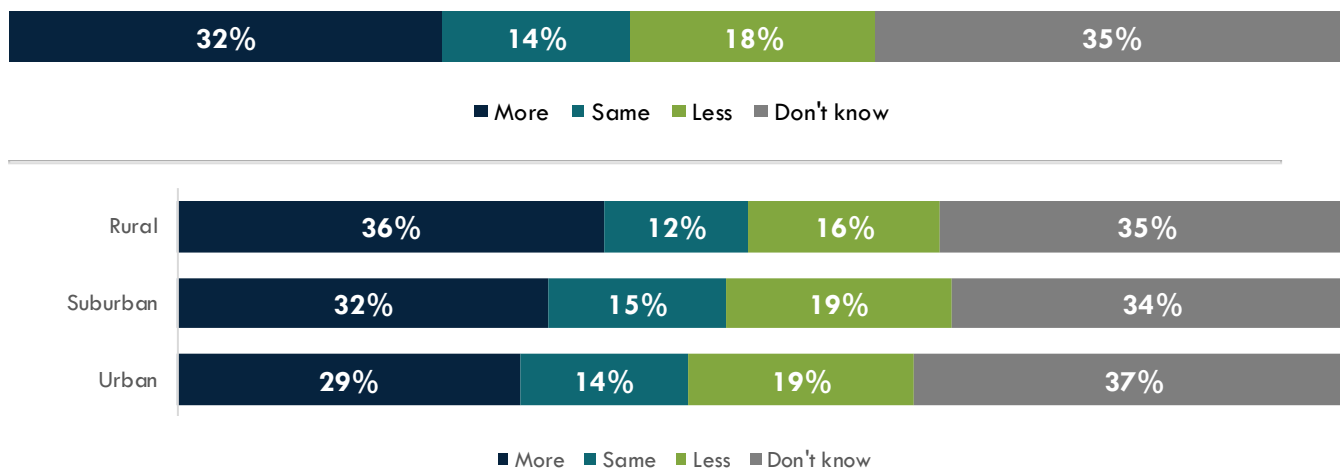
Based on the responses to questions two (estimated miles per gallon) and three (estimated miles driven each year), we calculated the actual gas tax participants would have paid and compared that to their estimate of tax paid. We estimated gallons of gas purchased per year (miles driven in-state divided by miles per gallon) and multiplied by the Washington State levied gas tax of \$0.494 per gallon.



Note: Due to outliers in the data, the axis range shows only results below \$2,500 (approximately 10 times the median results).
 Source: BERK Consulting, 2019.

- The median estimate of gas tax paid was \$260 per year. The median calculation of gas tax paid was \$201 per year (estimated with respondent inputs of miles driven-in-state and MPG).
- 720 respondents underestimated how much they pay in gas tax, 313 overestimated and 253 were accurate (within 10% of the calculated result).
 - The largest errors in estimating came from those who overestimated how much they pay in state gas taxes.

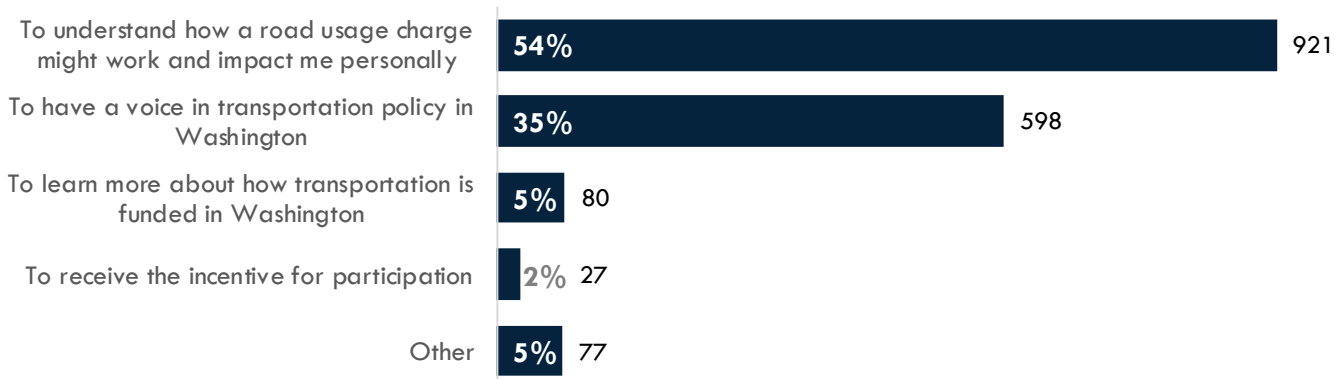
6. Under a RUC program, do you think you would pay more or less than your estimated state gas tax per year? (n=1,683)



Source: BERK Consulting, 2019.

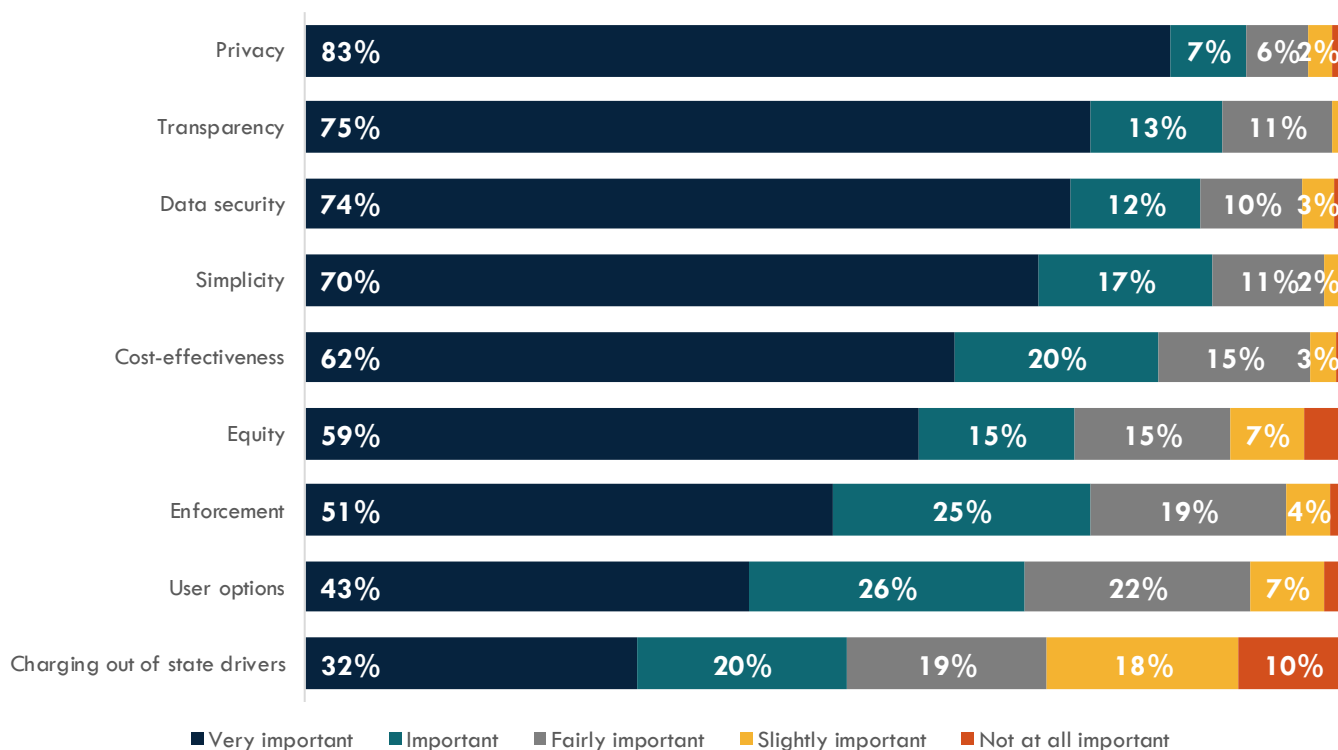
The RUC Pilot:

7. What is your primary motivation for participating in the RUC pilot? (n=1,703)



Source: BERK Consulting, 2019.

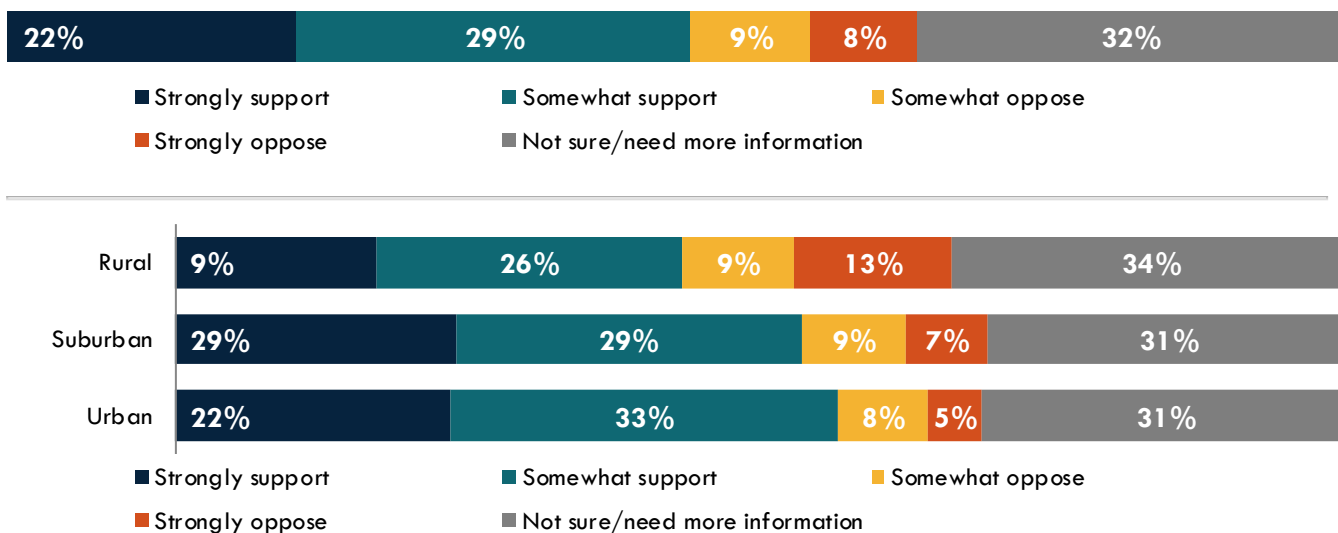
**8. How important to you are the following issues for a potential road usage charge system?
(n=1,675)**



Notes: The “no opinion” response option is removed from the exhibit. The survey also included a definition of each option. A complete list of principles and their definitions can be seen below. Principles were presented in random order when participants took the survey. Source: BERK Consulting, 2019.

PRINCIPLE	DEFINITION
Privacy	My personal and driving information cannot be sold to any organization or shared with entities other than those directly administering a RUC system without my consent.
Transparency	Clear information is available on the rate and how it is set, as well as RUC system operations.
Data security	A RUC system provides the highest level of data security possible and drivers can obtain information that clearly outlines the security measures.
Simplicity	A RUC system is easy to participate in and not time-consuming to comply with.
Cost-effectiveness	A RUC system is efficient for the State of Washington to collect, administer, and enforce.
Equity	All drivers pay their fair share based on how much they use the roads regardless of vehicle type.
Enforcement	A RUC system is easy to enforce, and costly to evade.
User options	A RUC system provides choices to drivers for how they report their miles.
Charging out of state drivers	Visitors to the state pay for their use of Washington roads.

9. At this point,¹ how do you feel about implementing a road usage charge as a replacement to the gas tax in Washington to fund transportation infrastructure? (n=1,675)

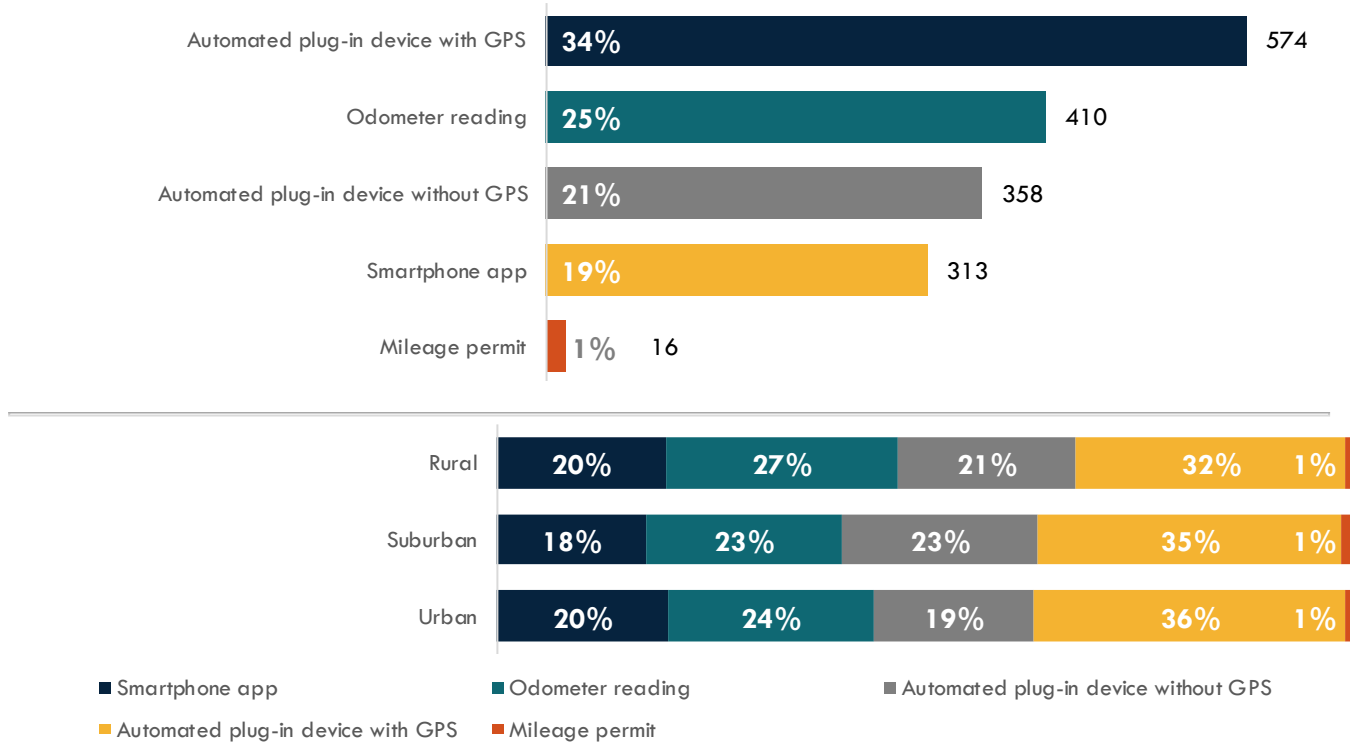


Source: BERK Consulting, 2019.

¹ The survey was administered to enrollees on an ongoing basis between March 8 and May 21, 2018. Participants at that point had just begun the pilot and some completed the survey immediately following enrollment.

Account Setup:

10. Which mileage reporting method did you select to test in the pilot? (n=1,671)



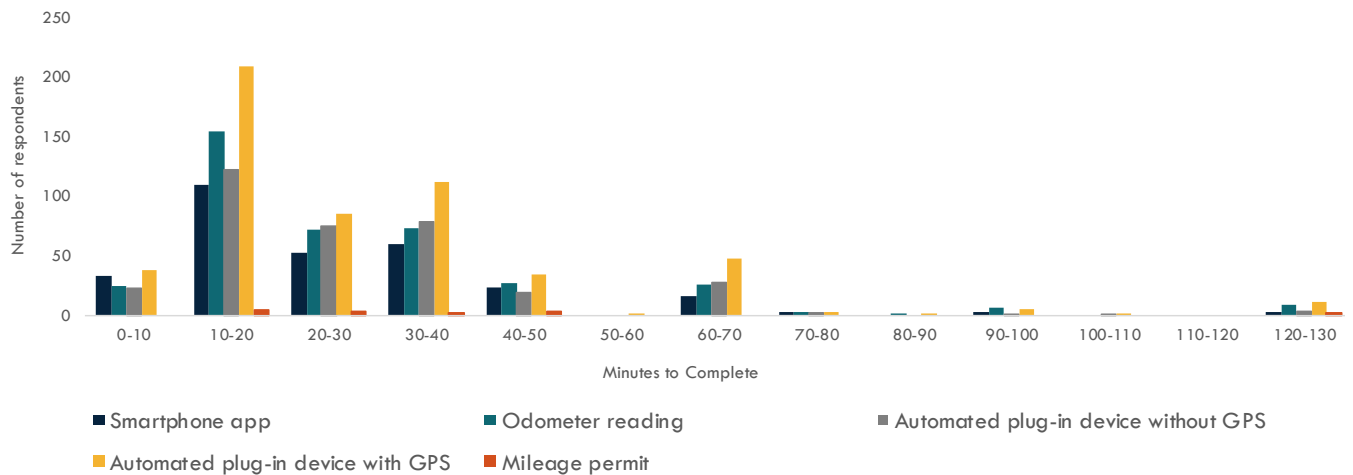
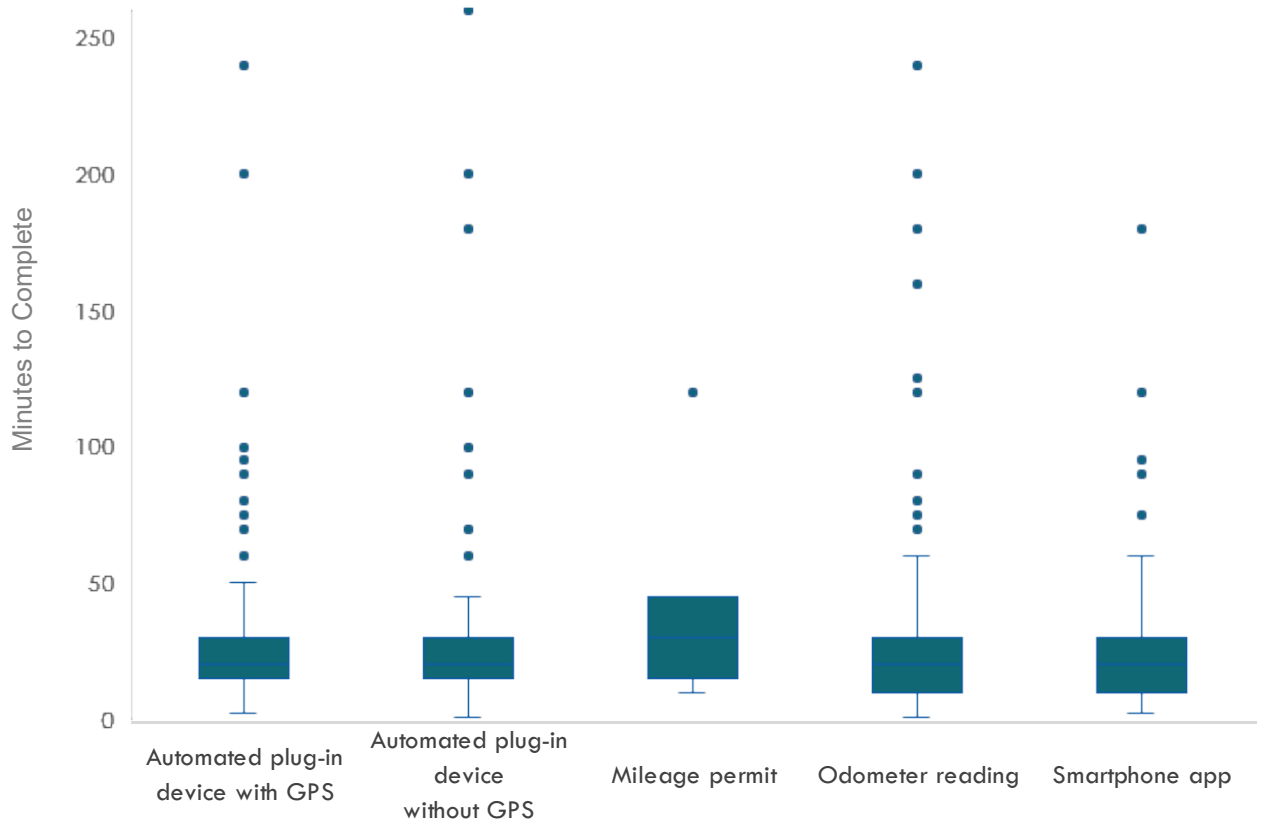
Source: BERK Consulting, 2019.

11. Why did you choose this method? (n=1,604)

This was an open-ended question. Responses were coded by theme, and many responses included more than one theme.

- **69%** (1,110 participants) provided a response related to the **ease and convenience** of the reporting method they selected.
- **11%** (178 participants) provided responses related to **privacy**. Participants had concerns about their movements being tracked, the security of their data, or other related reasons.
- **4%** provided responses related to **accuracy** of the mileage reporting (58 participants), 4% noted the desire to track **out-of-state** miles (58 participants), and 4% noted that they had an **older car** and certain technology was unavailable (61 participants).
- Other common responses were that participants were interested in **technology** (22 participants), that they had an Android phone so the **smartphone application was not available** (11 participants), that they wanted to **provide the most information** for the RUC pilot (18 participants), and that they did **not want to use GPS** (8 participants).

12. Approximately how much time did you devote to the enrollment and pilot vehicle registration process? (n=1,552)

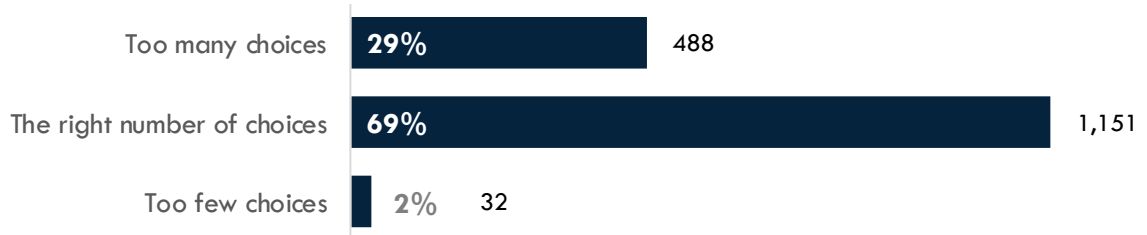


Note: Exhibit excludes outliers from display.

Source: BERK Consulting, 2019.

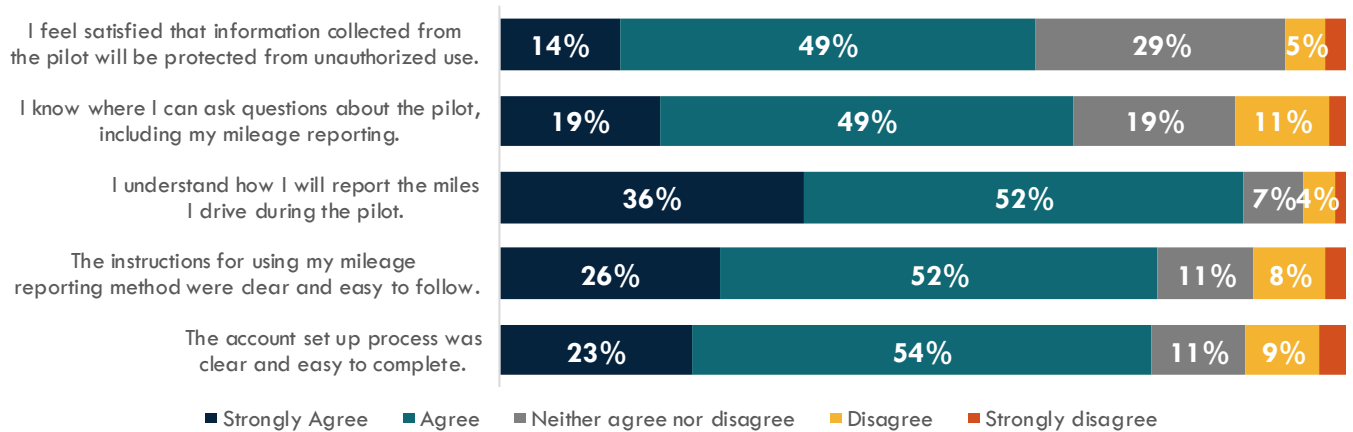
- Across each reporting methods, the median time devoted to the registration process was 20 minutes, with the majority (85%-97% of responses) reporting no more than one hour.
- Each reporting method had a few extreme responses leading to a high upper bound and standard deviation.

13. Having five mileage reporting options offered to choose from seemed like: (n=1,671)



Source: BERK Consulting, 2019.

14. Thinking about the RUC pilot account setup process, please indicate your level of agreement with the following: (n=1,667)

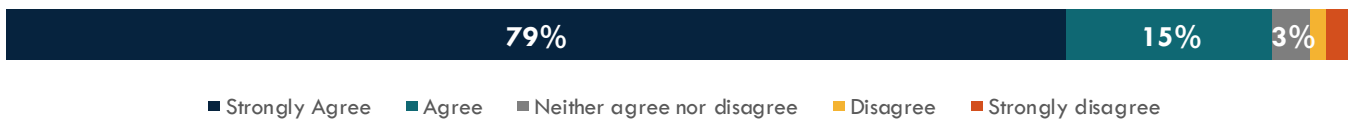


Source: BERK Consulting, 2019.

Transportation in Washington:

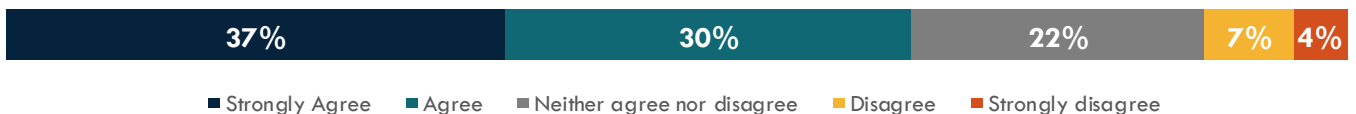
Please indicate your level of agreement with the following statements:

15. Washington State needs to ensure adequate funding is available to keep our transportation infrastructure safe, effective, and properly maintained. (n=1,670)



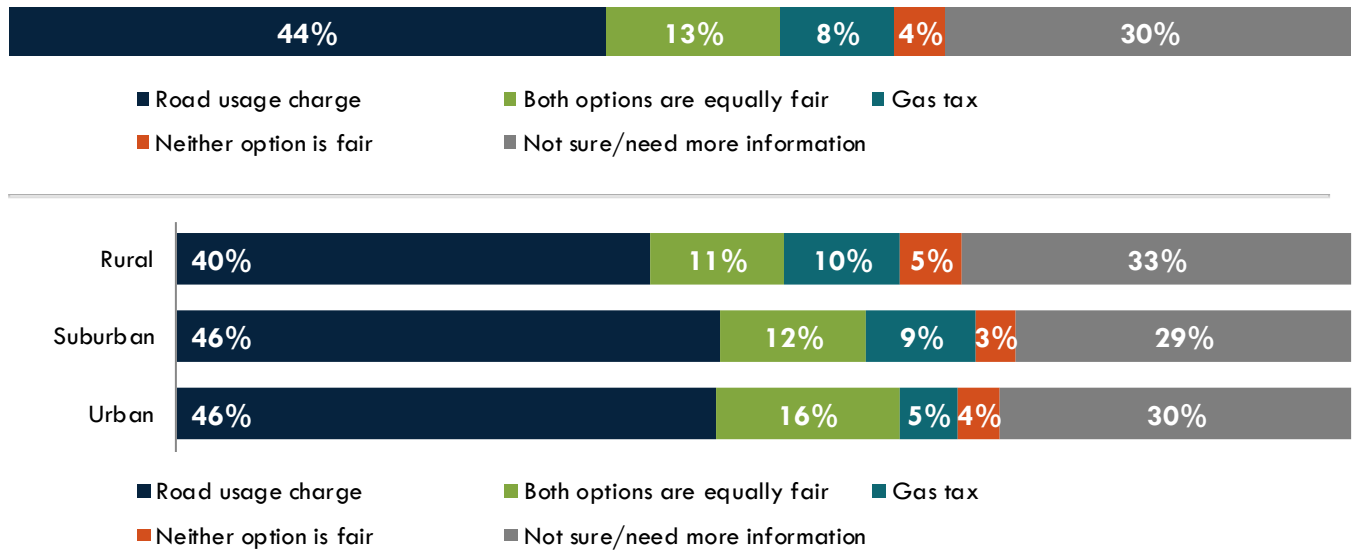
Source: BERK Consulting, 2019.

16. Washington State needs to find an alternative to the gas tax to adequately fund our transportation infrastructure. (n=1,670)



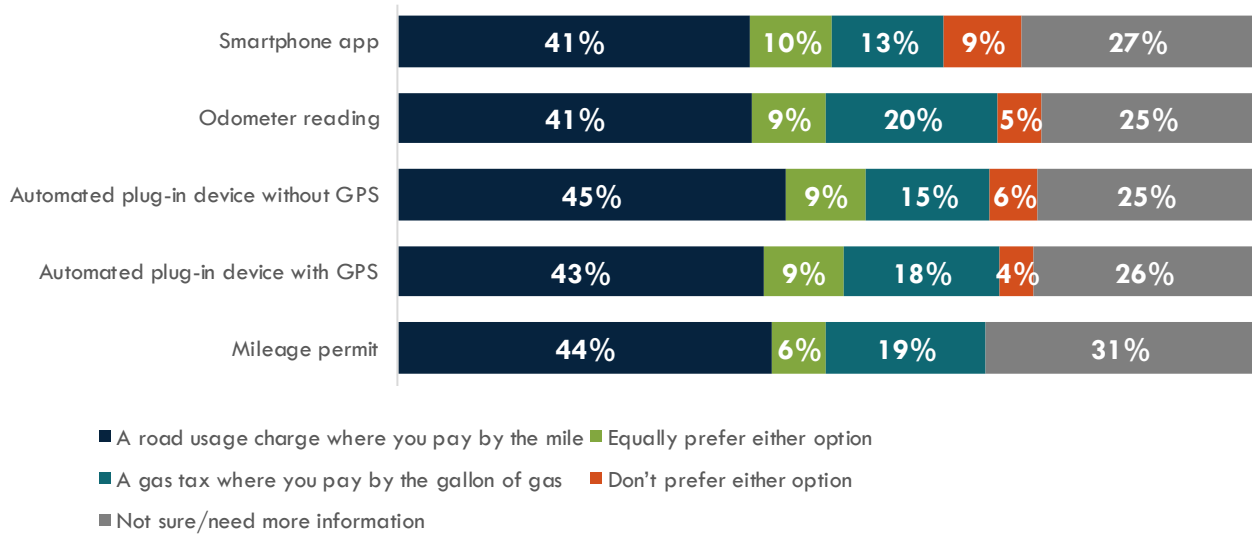
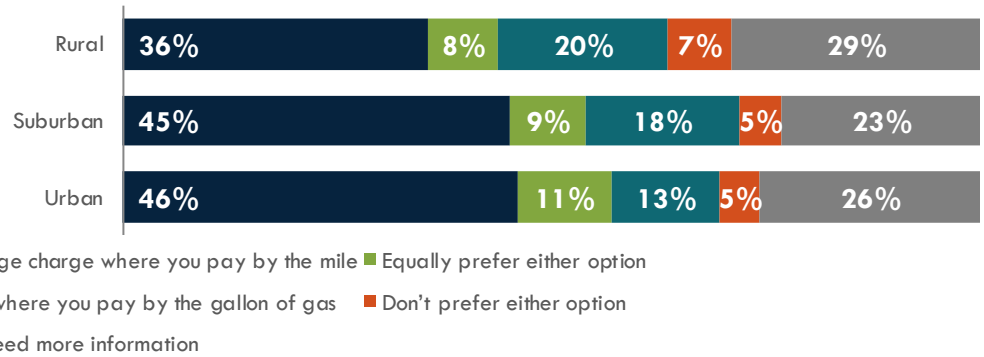
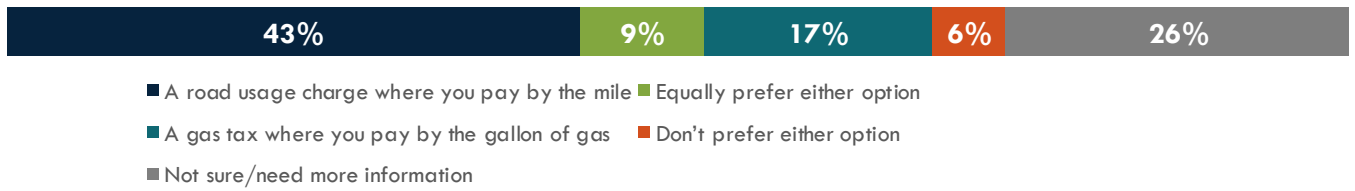
Source: BERK Consulting, 2019.

17. Of the options listed below, which transportation funding approach do you think is more fair? (n=1,670)



Source: BERK Consulting, 2019.

18. Fairness aside, knowing what you know today, which method to fund transportation would you prefer? (n=1,670)



Source: BERK Consulting, 2019.

Survey 2 Results

INTRODUCTION

This document summarizes the results of Pilot Participant Survey #2. The survey collected information on participants' driving habits and perspectives, how the pilot is impacting them, and their views on a potential road usage charge system.

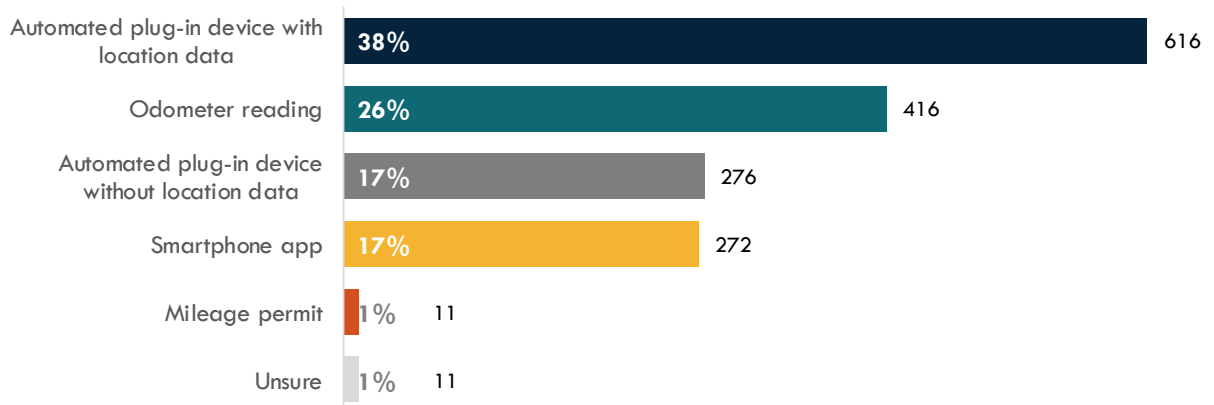
The survey was distributed to pilot participants from September 24 to October 8, 2018. For the second survey, 2,106 invitations were sent to pilot participants with 1,598 responses, for a conversion rate of 76%. Because some respondents skipped questions, some questions include a sample size (n) listed next to the question. Some participants received additional questions based on their responses (for example, those who contacted the WA RUC Help Desk).

SURVEY 2 RESULTS

Your pilot reporting method:

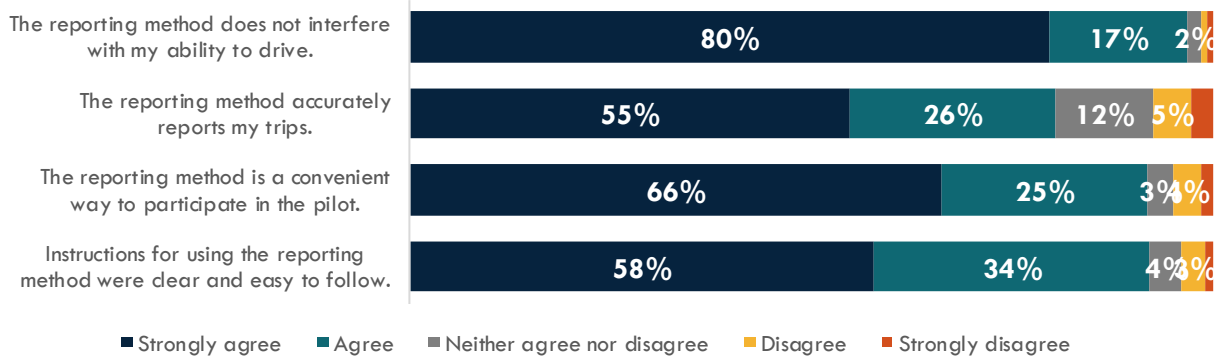
- 38% of survey respondents used an automated plug-in device with location data, followed by 26% using the odometer reading and 17% each using the automated plug-in device without location data and the smartphone app. Only 1% selected the mileage permit.
- Respondents generally indicated that the reporting methods do not interfere with their ability to drive. Almost all respondents indicated that all pilot activities take less than five minutes per month.

19. Which mileage reporting method are you currently testing in the pilot? (n=1,602)



Source: BERK Consulting, 2019.

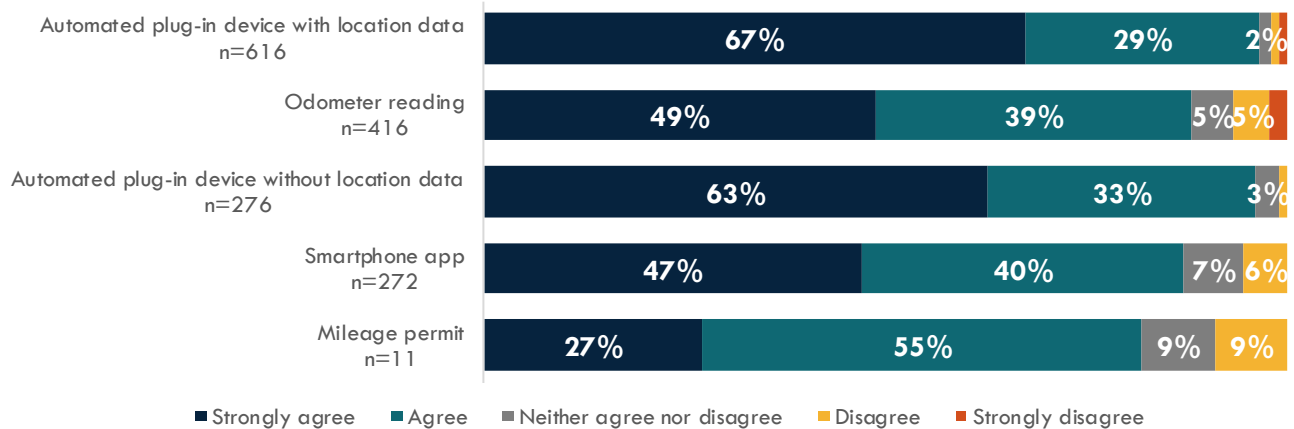
20. Please indicate your level of agreement with the following statements about your current reporting method: (n=1,602)



Source: BERK Consulting, 2019.

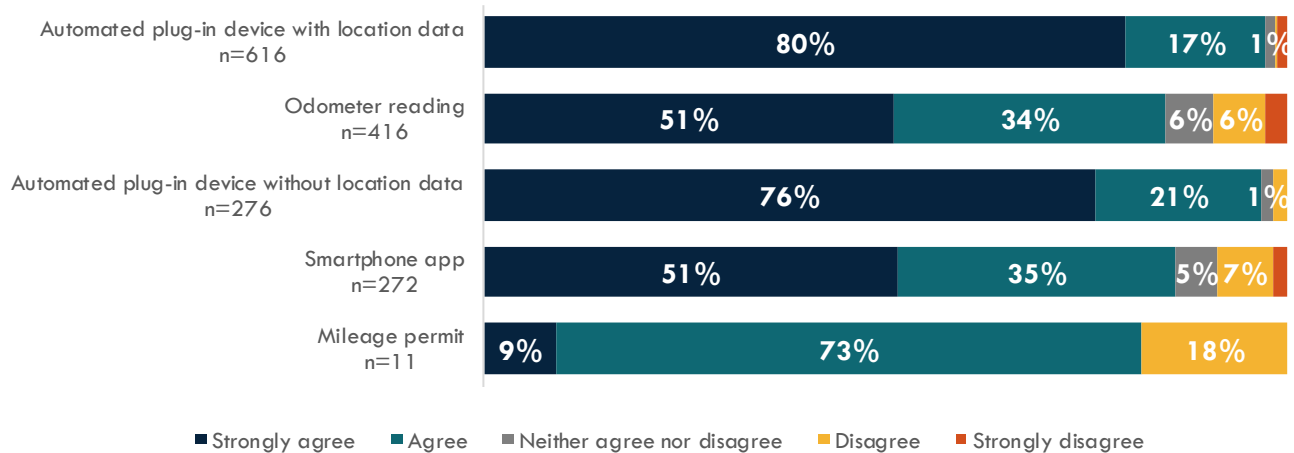
Responses by device:

“Instructions for using the reporting method were clear and easy to follow.”



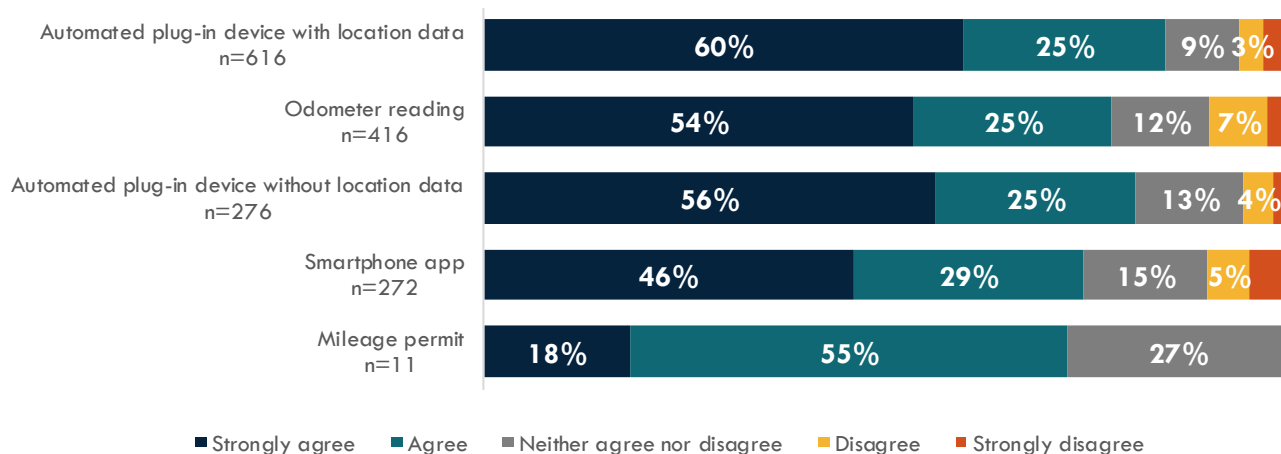
Source: BERK Consulting, 2019.

“The reporting method is a convenient way to participate in the pilot.”



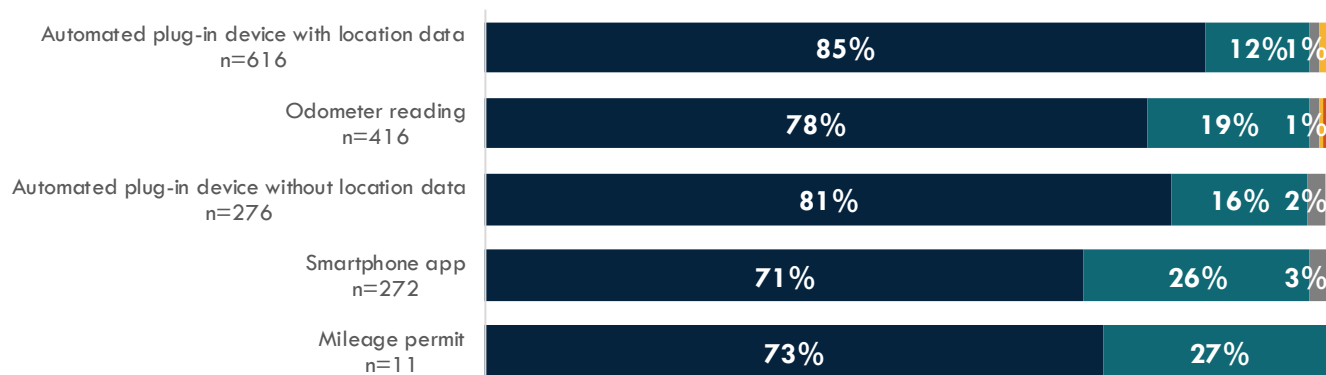
Source: BERK Consulting, 2019.

"The reporting method accurately reports my trips."



Source: BERK Consulting, 2019.

"The reporting method does not interfere with my ability to drive."



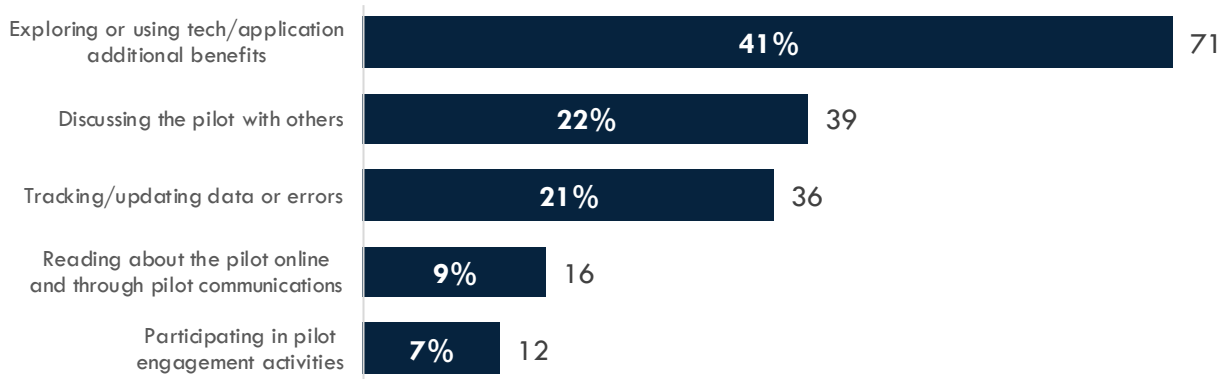
Source: BERK Consulting, 2019.

21. How much time do you spend on each of the following pilot activities per month? (Please answer in minutes.) (n=1,590)



22. Please list any other ways you spend your time on the RUC pilot each month. (n=677)

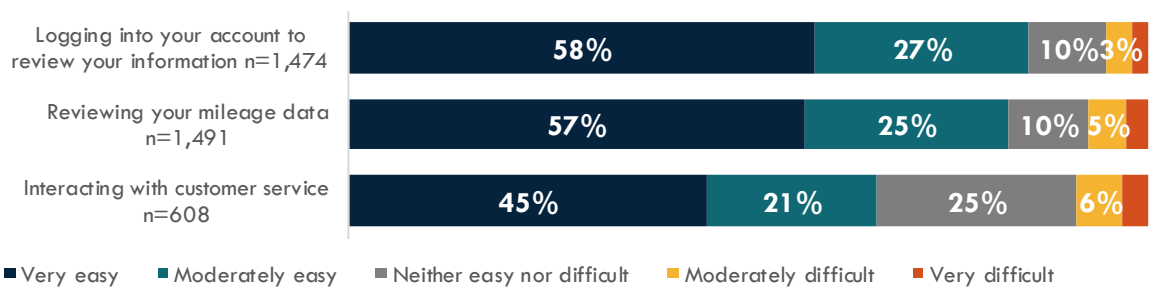
Note: These are open-ended responses that have been grouped by theme. Not all responses fit within a response theme.



Source: BERK Consulting, 2019.

- Most of the other respondents indicated they do not spend time on any other activities, other than those listed in Question 3. Reasons for this include:
 - The pilot is convenient, easy, and effortless.
 - They just let the pilot do its job and forget about it.
 - They do not think about the pilot other than driving and/or reporting.
 - The pilot is still too new.
- Other tasks that respondents mentioned spending time on include:
 - Reconnecting the plug-in device when it fell off the connector.
 - Figuring out how to use the smartphone camera to submit the image.
 - Printing out paperwork and reading it; creating a spreadsheet showing mileage and charges.
 - Trying to understand how the program works.
 - Trying to remember to use the app to record mileage.

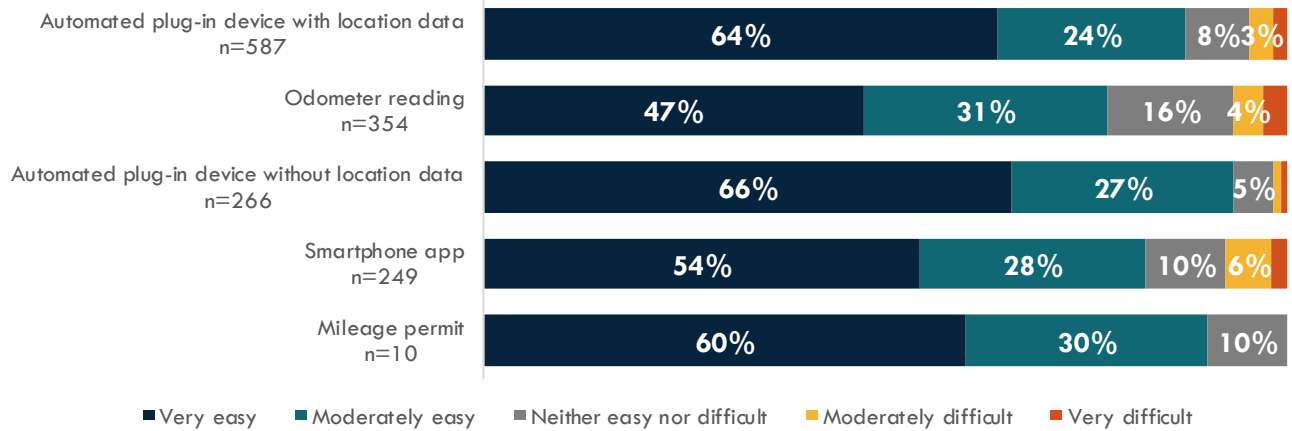
23. Please rate the following pilot activities in terms of ease of completion. (n=1,602).



Note: N/A responses were removed from the exhibit.
Source: BERK Consulting, 2019.

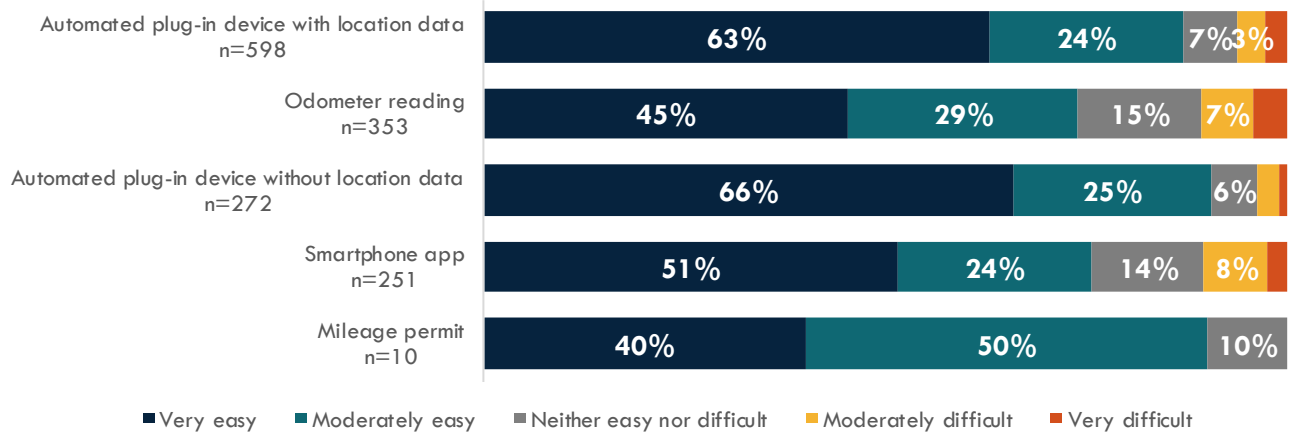
Responses by device:

Logging into your account to review your information



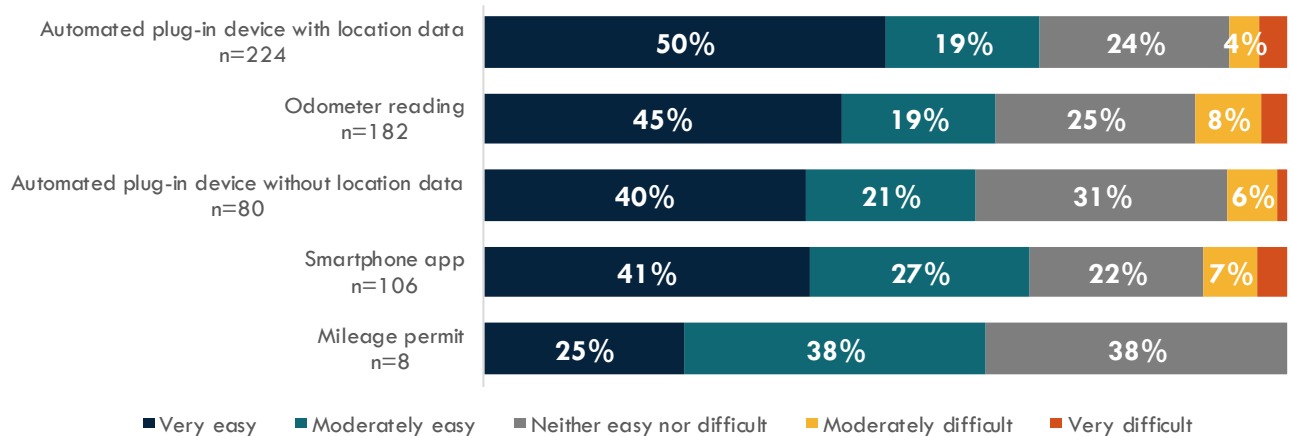
Source: BERK Consulting, 2019.

Reviewing your mileage data:



Source: BERK Consulting, 2019.

Interacting with customer service:

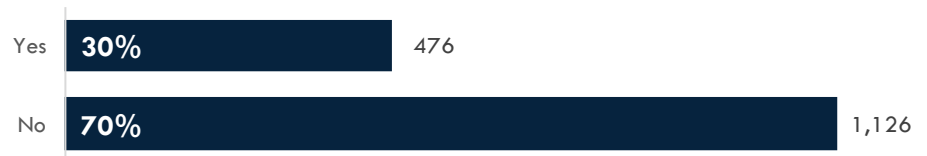


Source: BERK Consulting, 2019.

Our Communications with You:

- 30% of respondents indicated that they have contacted the WA RUC Help Desk, and participants seemed satisfied with Help Desk interactions.
- 73% have visited the WA RUC website, and of those, 91% found the information they were looking for on the website.
- Participants who did not find what they were looking for on the WA RUC website were seeking device information or other error resolution help.

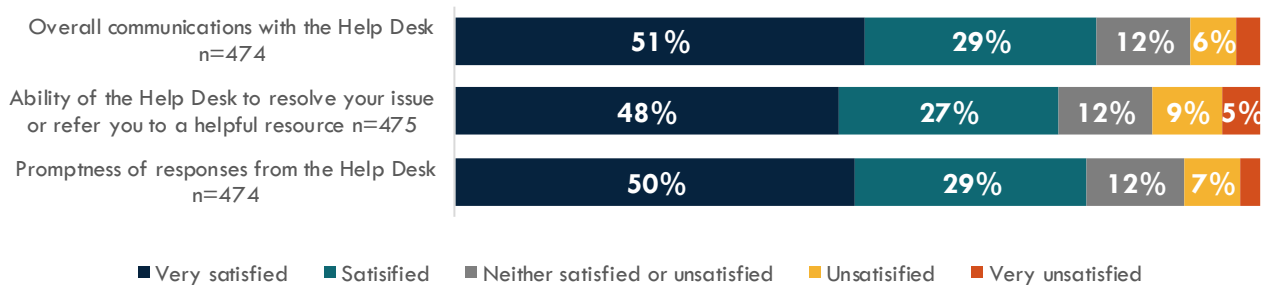
24. Have you contacted the WA RUC Help Desk (1-833-WASH-RUC or info@waroadusagecharge.org)? (n=1,602)



Source: BERK Consulting, 2019.

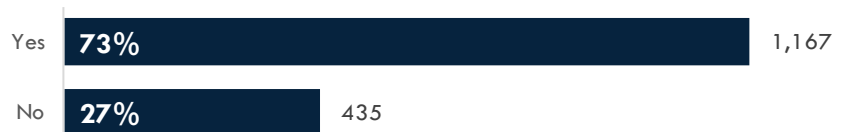
25. Please indicate your level of satisfaction for each of the following: (n=476)

Note: This only includes participants who contacted the WA RUC Help Desk.



Source: BERK Consulting, 2019.

26. Have you visited the WA RUC website (waroadusagecharge.org)? (n=1,602)



Source: BERK Consulting, 2019.

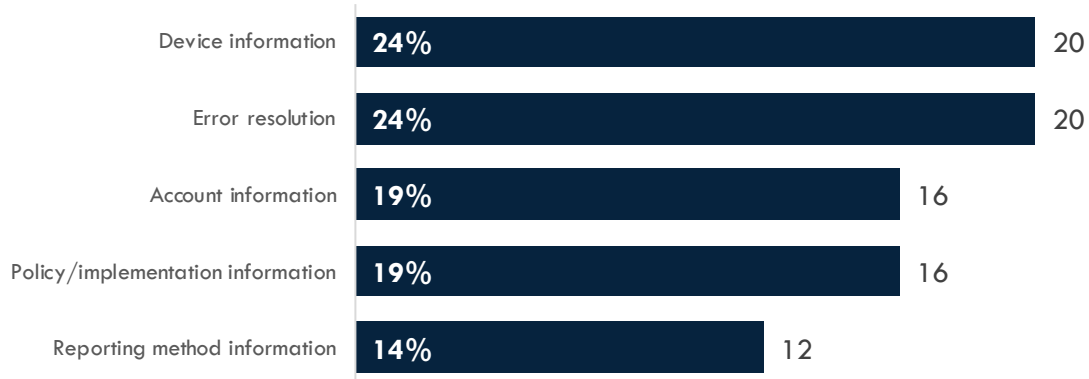
27. For those who have visited the WA RUC website, were you able to find the information you were looking for on the website? (n=1,153)



Note: This only includes participants who have visited the WA RUC website.

Source: BERK Consulting, 2019.

- a. *If no, what information were you looking for that you could not find?*
“No” response comments categorized by theme:

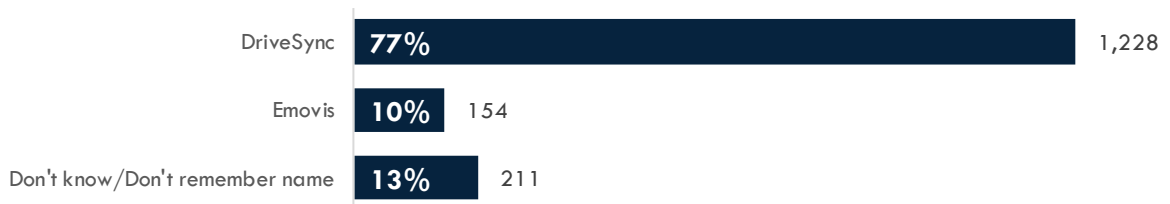


Source: BERK Consulting, 2019.

The RUC Pilot Experience:

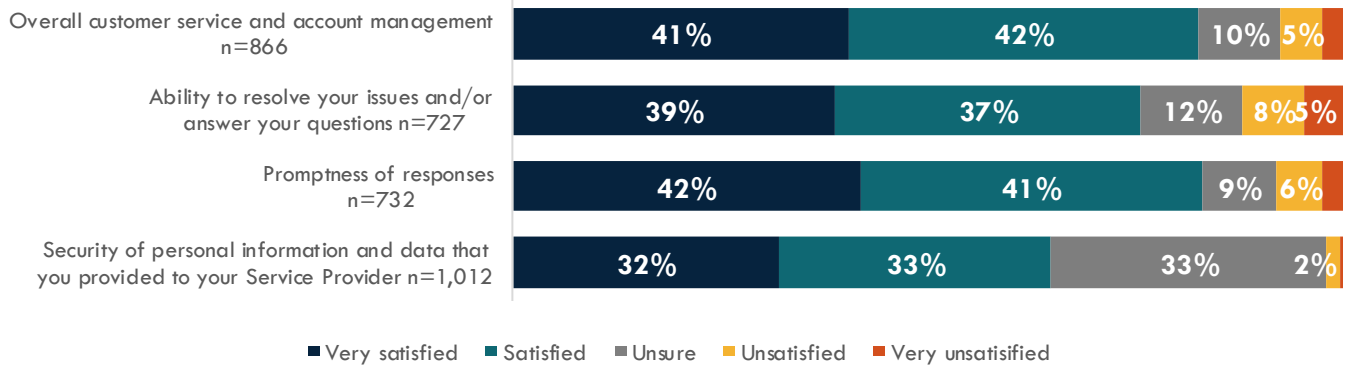
- 77% of participants selected DriveSync as their Service Provider, while 10% selected Emovis and 13% do not know or do not remember the name of their provider. Of those who contacted their RUC Service Provider, most have been satisfied with interactions.
- Most respondents were very satisfied with the ease of participation and amount of time spent on the pilot.
- Most respondents whose driving behavior changed indicated that they became safer and more aware as drivers.

28. Who is your RUC Service Provider? (n=1,593)



Source: BERK Consulting, 2019.

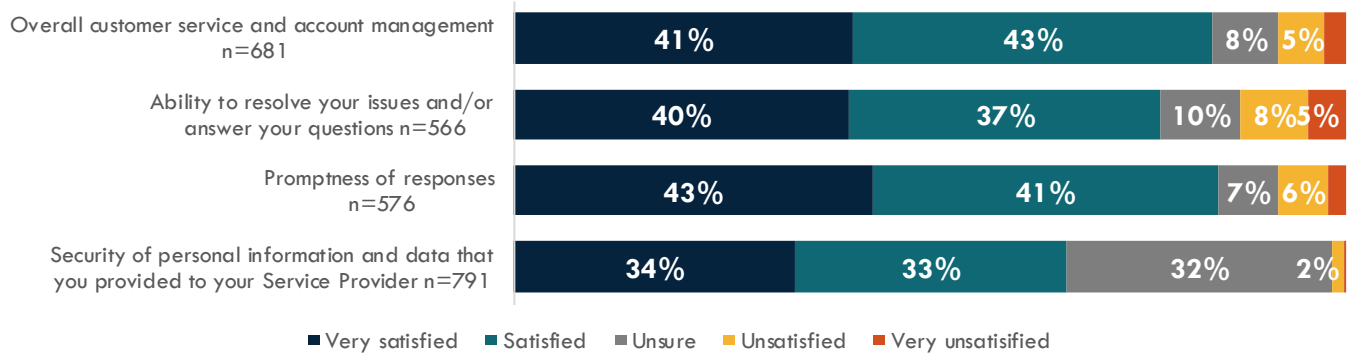
29. Please indicate your level of satisfaction with your RUC Service Provider for each of the following: (of those who have contacted their RUC Service Provider)



Source: BERK Consulting, 2019.

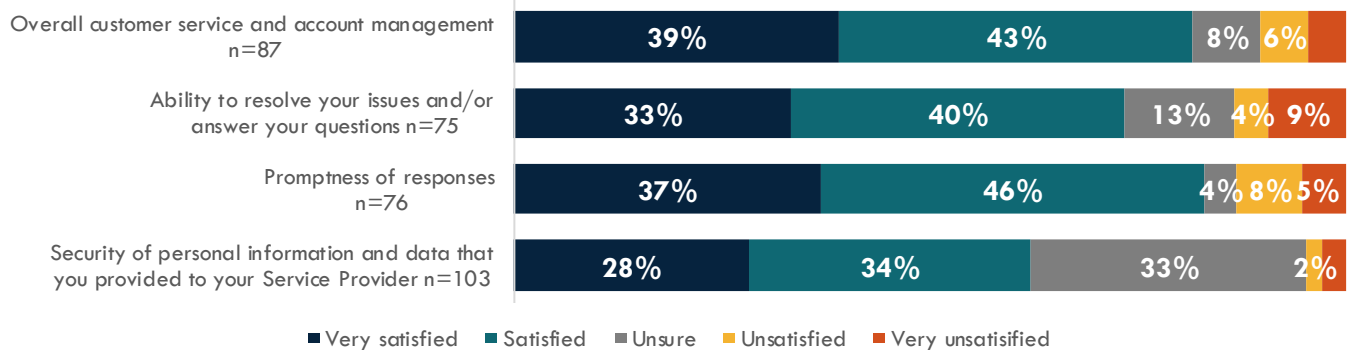
Responses by RUC Service Provider: (n=1,501)

Provider: DriveSync



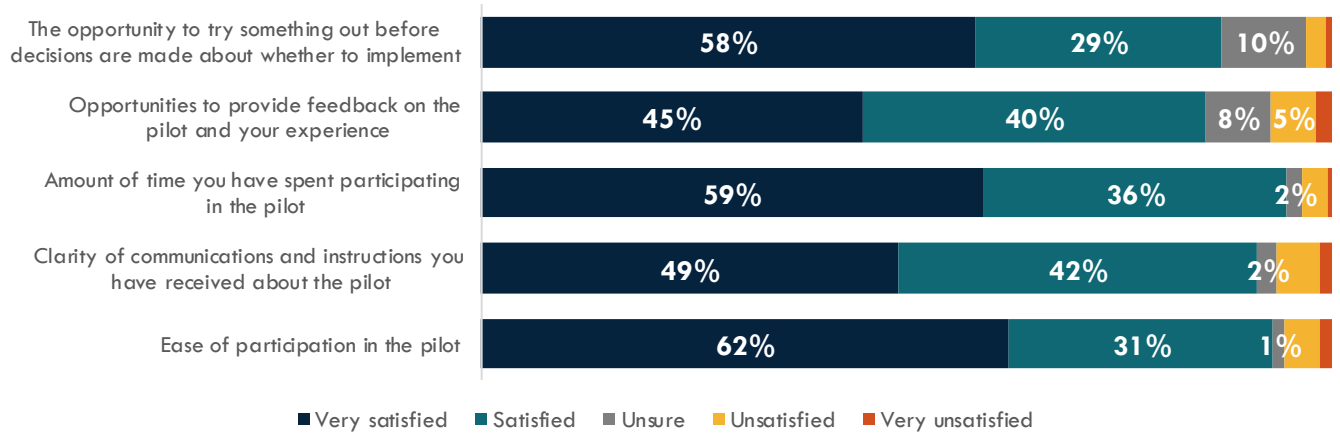
Note: N/A responses were removed from the exhibit and only includes those who have contacted their RUC Service Provider.
Source: BERK Consulting, 2019.

Provider: Emovis



Note: N/A responses were removed from the exhibit and only includes those who have contacted their RUC Service Provider.
Source: BERK Consulting, 2019.

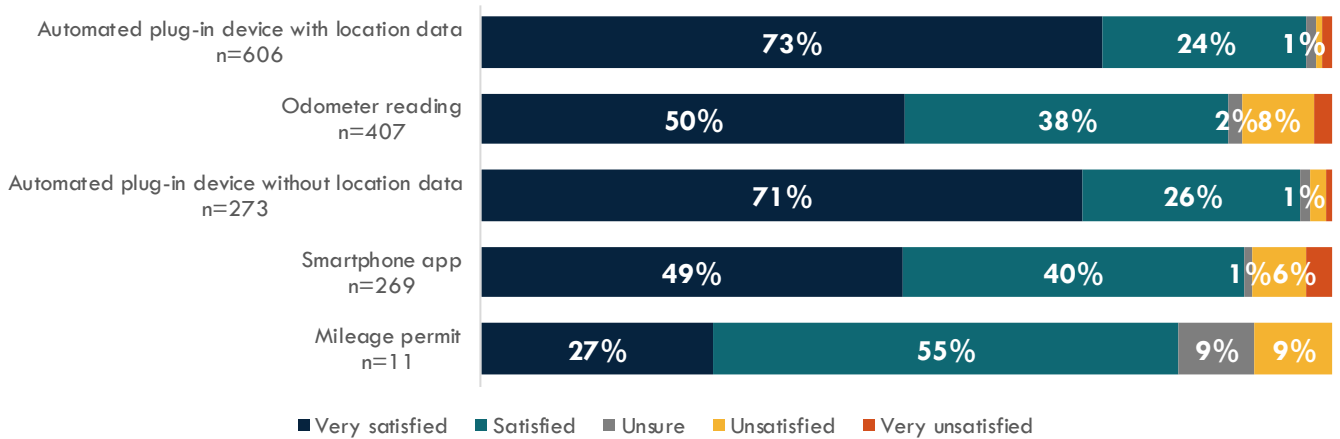
30. Thinking about your experience with the RUC pilot so far, how satisfied are you with each of the following? (n=1,576)



Source: BERK Consulting, 2019.

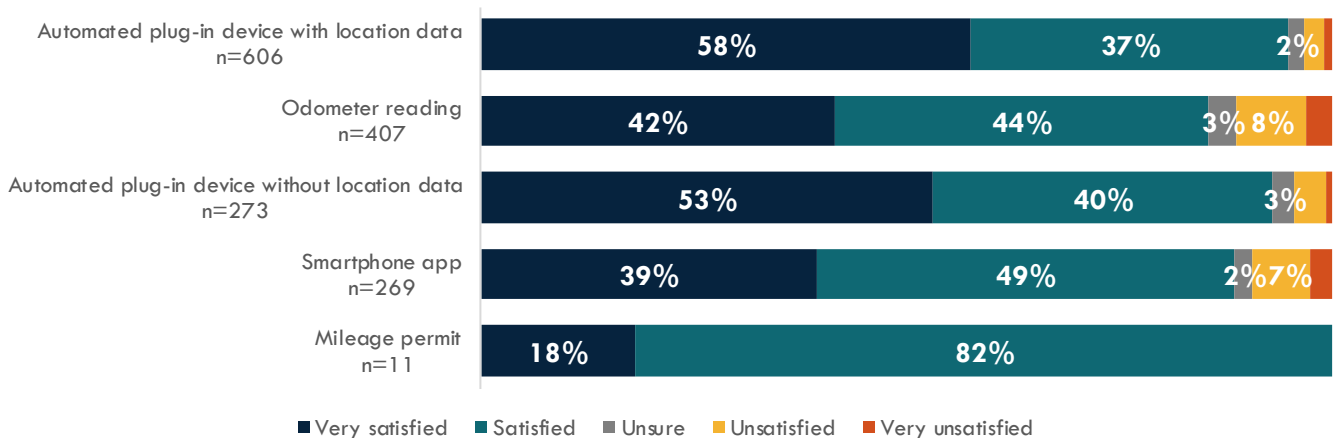
Responses by device:

Ease of participation in the pilot:



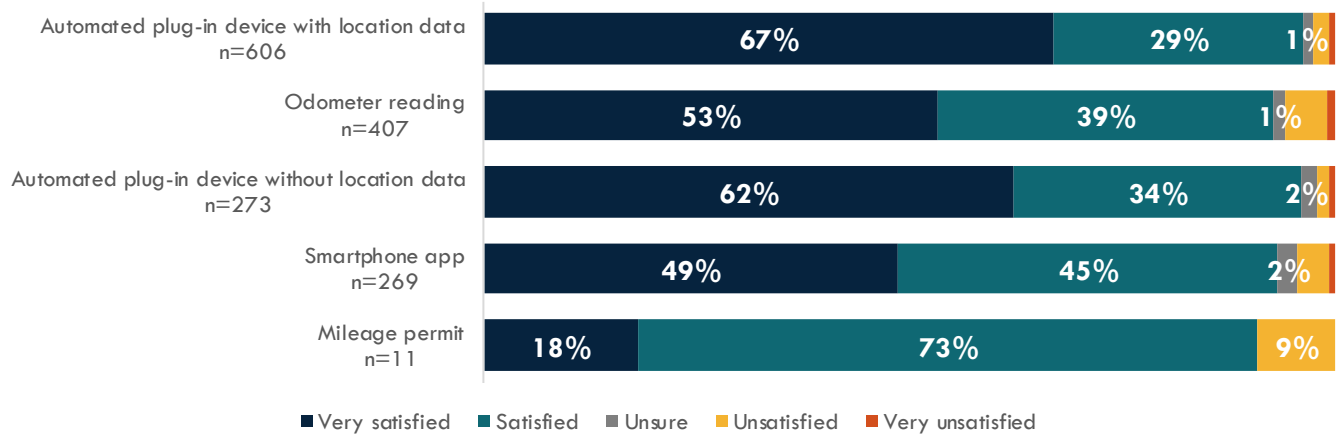
Source: BERK Consulting, 2019.

Clarity of communications and instructions you have received about the pilot:



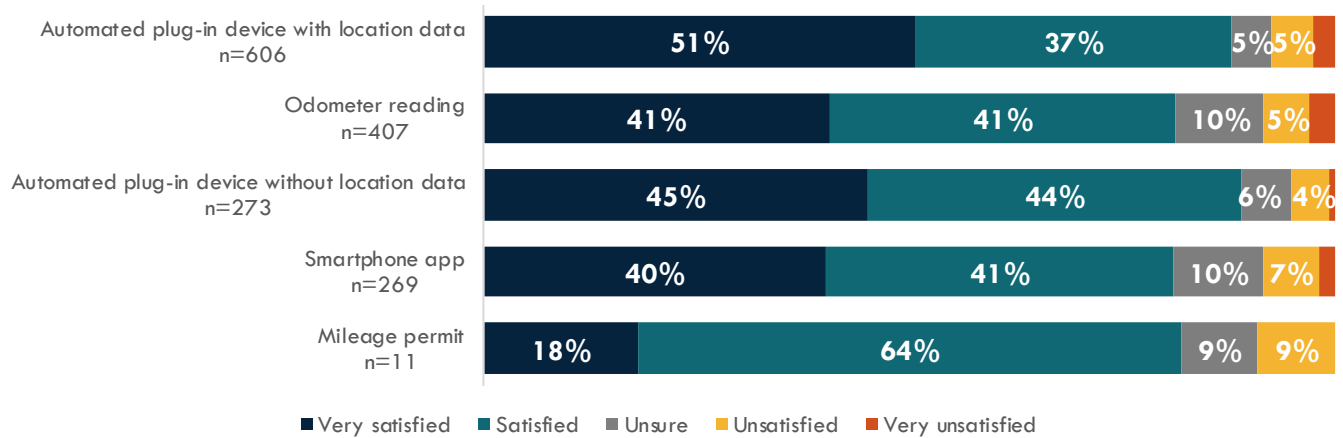
Source: BERK Consulting, 2019.

Amount of time you have spent participating in the pilot:



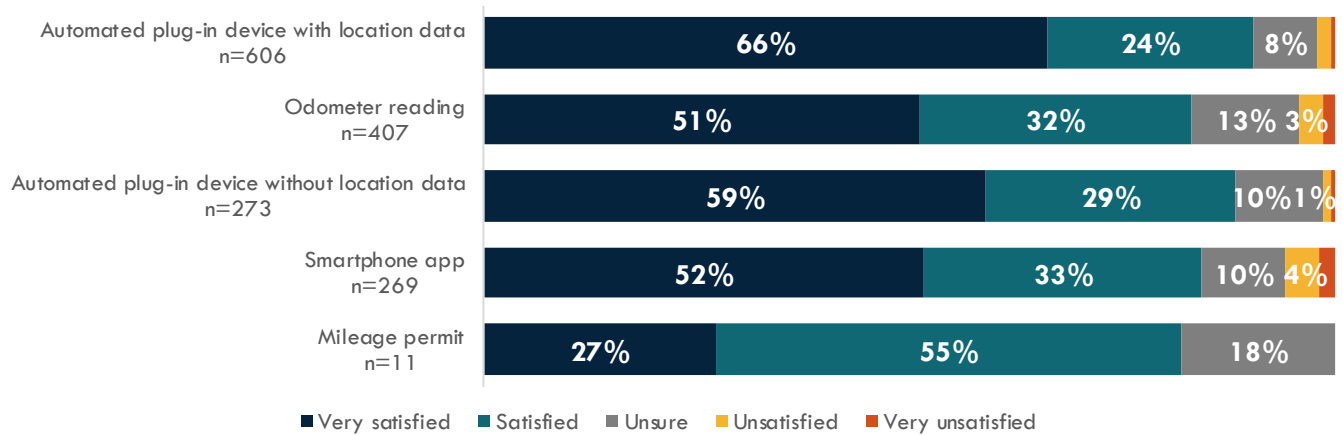
Source: BERK Consulting, 2019.

Opportunities to provide feedback on the pilot and your experience:



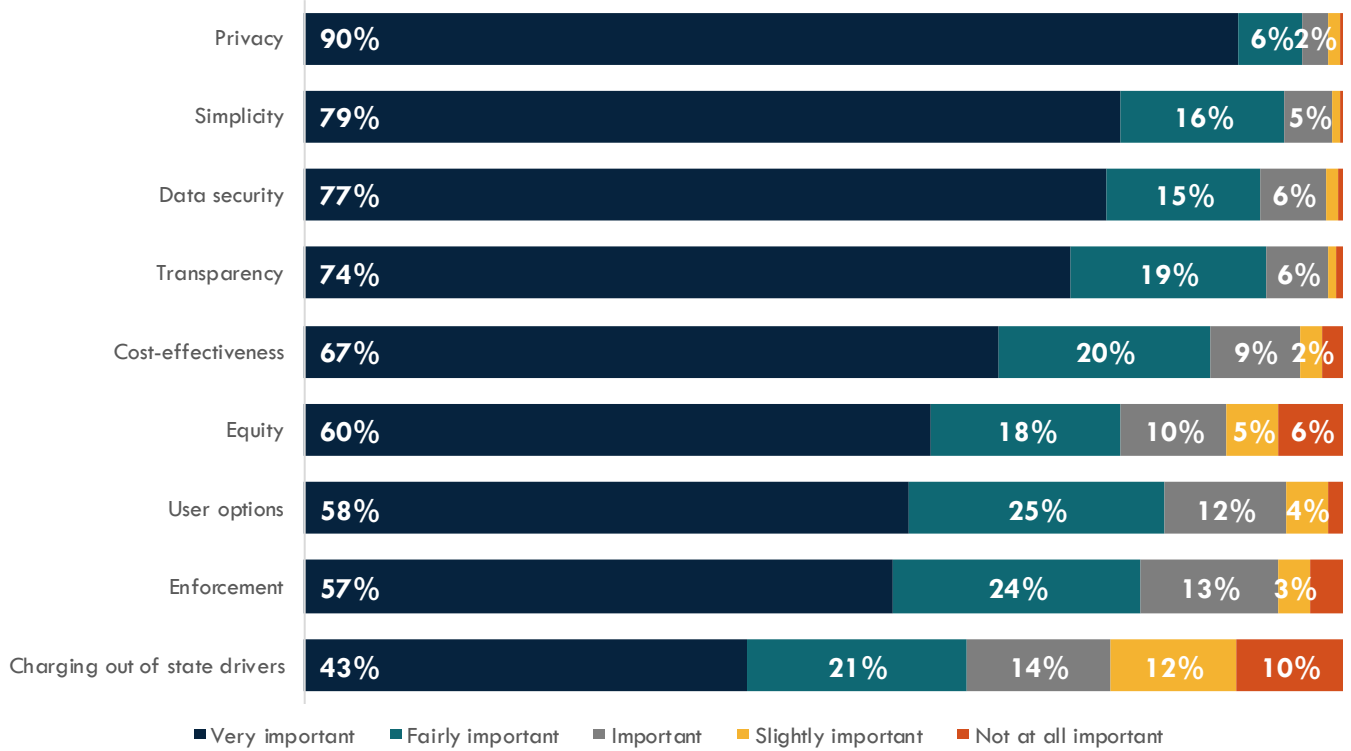
Source: BERK Consulting, 2019.

The opportunity to try something out before decisions are made about whether to implement:



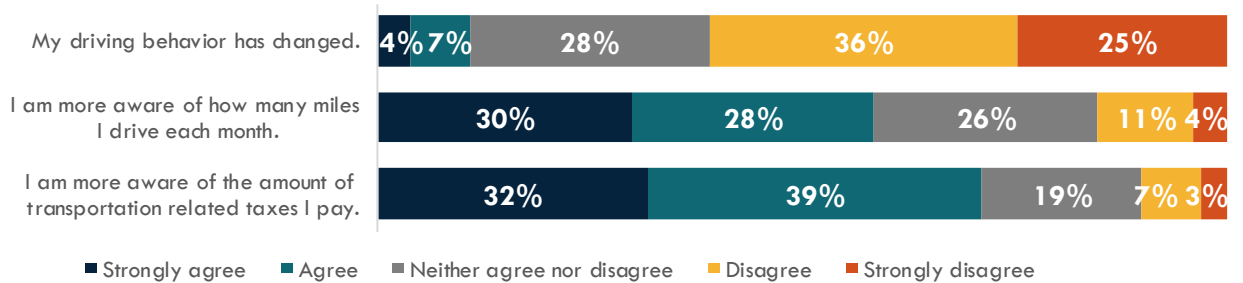
Source: BERK Consulting, 2019.

31. How important to you are the following principles for a potential road usage charge system? (n=1,575)



Note: Survey respondents were presented with full statements defining these principles without the label that describes each statement. The principle label is presented here for simplicity. A complete list of principles and their definitions can be found earlier in the Appendix. The statements were presented in random order when participants took the survey.
Source: BERK Consulting, 2019.

32. Based on your participation to date in the RUC pilot, please indicate your level of agreement with each of the following: (n=1,576)

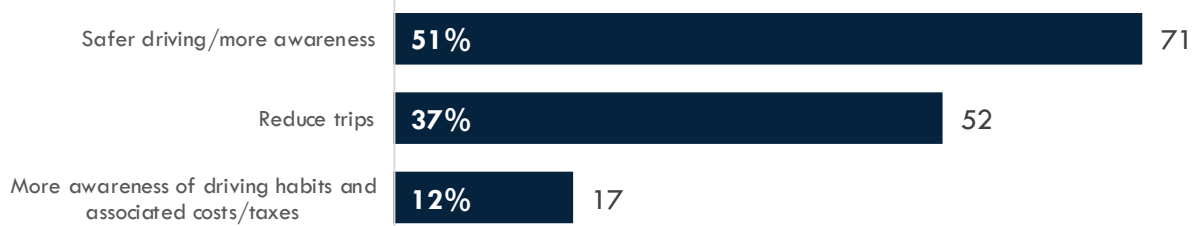


Source: BERK Consulting, 2019.

33. If you answered agree or strongly agree to "my driving behavior has changed," in what ways has it changed?

Among the 11% of respondents (169) that indicated their driving behavior has changed, we coded and summarized open-ended responses by theme. The most commonly described changes relate to safer driving/more awareness of driving, reduced trips, and more awareness of driving habits and associated costs/taxes.

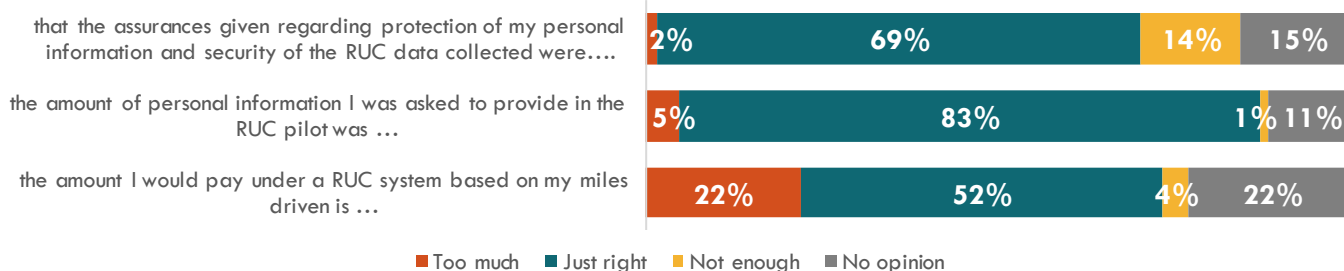
"My driving behavior has changed" open-ended responses categorized by theme:



Note: Not all responses fit within a response theme.
Source: BERK Consulting, 2019.

- Some respondents indicated uneasiness about a potential RUC system that might shape behavior through taxes or fees. There is concern about a government role in influencing driving habits.
- Some participants who drive significant miles noted that their behavior has not changed and that they have no choice but to drive their current route (for work, errands, etc.) regardless of associated costs.
 - "Commute is the commute."
 - "The reality is that you need groceries and need to go to work so it has zero real impact other than more cost and more worry."
- Some rural participants were especially concerned that they have no options to change their driving behavior and that a potential RUC system would only benefit urban areas.
 - "Please do not penalize us for living in a rural area."
 - "I continue to think this pilot is only benefiting King and Pierce counties, and not the majority of the state, where public transportation options are few and far between."

34. Based on your participation in the RUC pilot, how do you feel about each of these areas? (n=1,576)

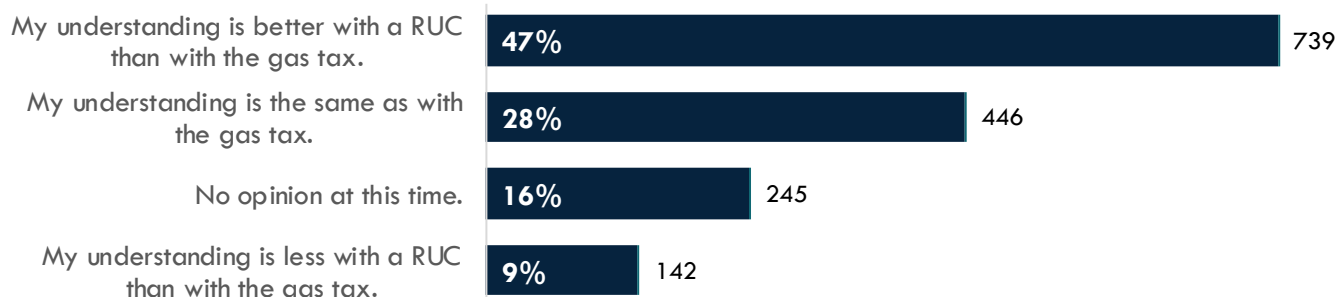


Source: BERK Consulting, 2019.

Transportation Funding in Washington:

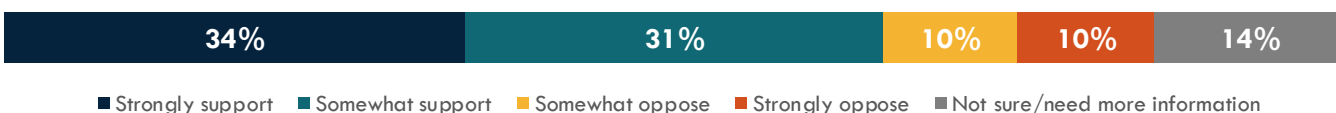
- Frequent comments concerning implementation of a RUC were about the system’s accuracy and people’s ability to potentially cheat the system more easily than with a gas tax.
- Among those who support a RUC less now compared with at the start of the pilot, the most common reason was the complexity of the system both for drivers and the State in terms of implementation.

35. Based on your pilot invoices, how do you feel about your ability to understand what you pay in transportation tax? (n=1,572)



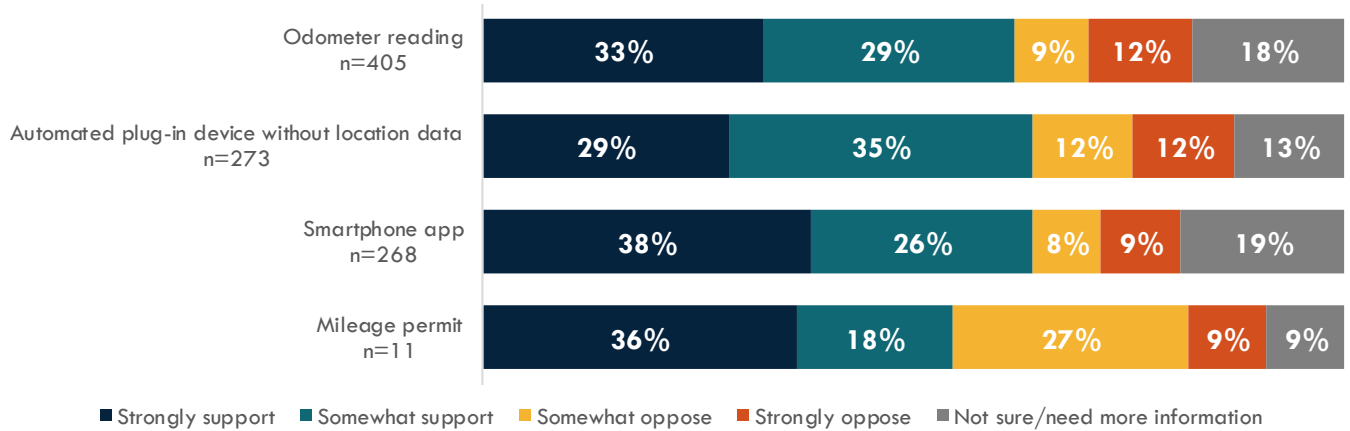
Source: BERK Consulting, 2019.

36. At this point, how do you feel about implementing a road usage charge as a replacement to the gas tax in Washington to fund transportation infrastructure? (n=1,572)



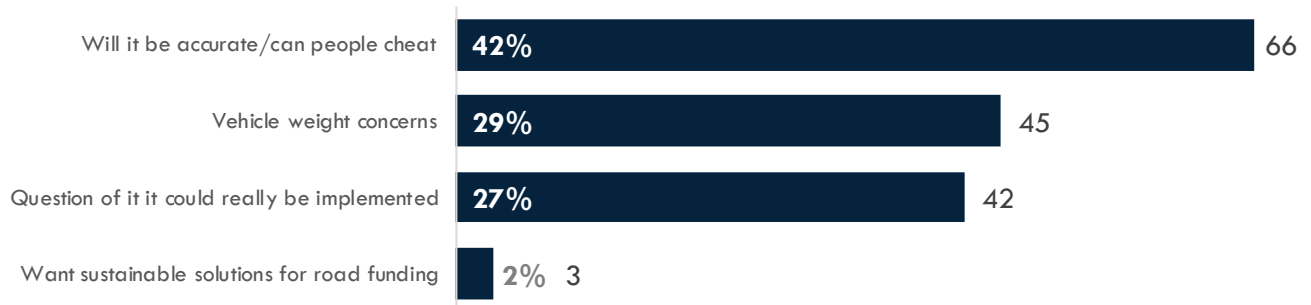
Source: BERK Consulting, 2019.

Responses by device:



Source: BERK Consulting, 2019.

a. *Open-ended “Additional comments” were coded and categorized by theme. Below are some of the most common themes:*

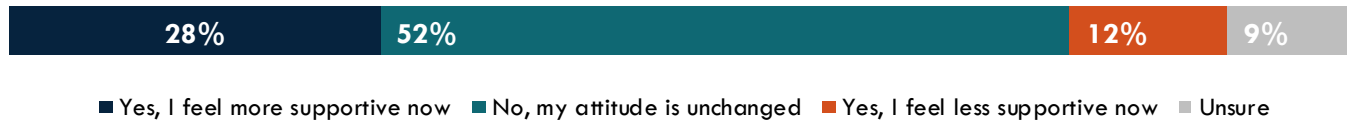


Source: BERK Consulting, 2019.

- Accuracy/cheating concerns include:
 - Ensuring that the system is accurate.
 - Concerns about disincentivizing electric vehicles.
 - Making sure the system is transparent.
 - Ensuring that out-of-state drivers are paying for use of the roads.
- Participants who support a RUC system indicated:
 - They are interested in sustainable solutions to road funding.
 - This is a fair way to ensure everyone pays their share of road maintenance.
 - RUC levels the playing field between gas and electric vehicles.
- Several people noted that it matters where revenues from RUC are spent; they want to make sure that the revenues are used on road projects around where they live. Taxes they pay should go toward their own communities.

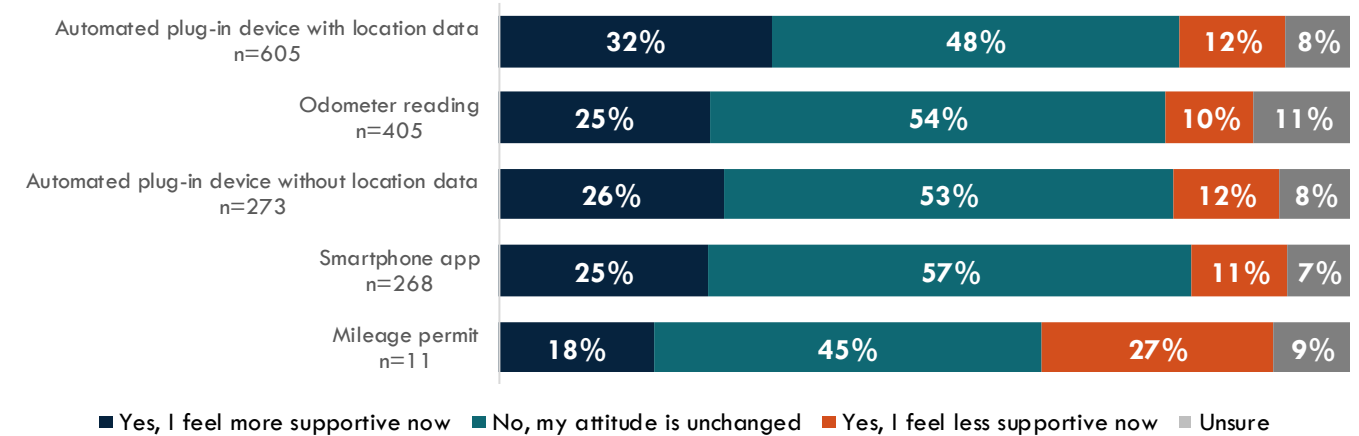
- Participants offered additional ideas to supplement the proposed RUC system:
 - A blended system – a combination of a RUC with the existing gas tax.
 - Congestion pricing – rather than a fixed price per mile.
 - Pricing tiers based on how much you drive.
 - Taxing electric and hybrid vehicles more proportionately to their road usage than their fuel consumption.

37. Since the beginning of the pilot, has your attitude towards a road usage charge system changed? (n=1,572)



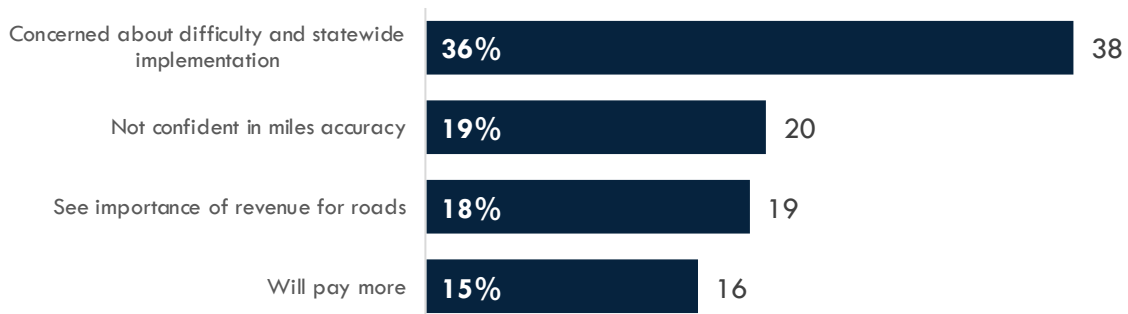
Source: BERK Consulting, 2019.

Responses by device:



Source: BERK Consulting, 2019.

a. Open-ended “More/less supportive” responses were coded and categorized by theme. Below are some of the most common themes:



Source: BERK Consulting, 2019.

- Among those who are now more supportive of a RUC system, common responses related to:
 - Seeing the importance of revenue to pay for roads.
 - Believing that RUC seems more equitable.
 - RUC is easy.
 - They feel they would pay less under RUC.
 - They prefer a tax based on how much they've driven and not how efficient their vehicle is.
- Among those who are now less supportive of a RUC system, common responses related to concerns about:
 - Difficulty of statewide implementation.
 - Lack of confidence in the accuracy of miles reported.
 - A belief that they will pay more under RUC than under the gas tax.
 - Equity concerns that this decreases the financial incentive to purchase fuel efficient vehicles.

38. Please share any other comments you have below: (n=363)

This question asked for open-ended comments, and they have been categorized by theme:

Out of 363 respondents who provided open-ended responses, 67 commented about the **technology or reporting methods issues**, including:

- Apps do not work.
- Website links do not work.
- Do not understand the points system in the app.
- Could not install equipment in vehicle.
- Received notification to record mileage, but app says none required.
- Adapter does not fit their truck.
- iPhone camera permission does not allow the app to take photos.
- Could not use the device without GPS because of an electric car.
- Odometer is broken and cannot report miles.

36 people mentioned **vehicle equity issues**. This generally fell in two areas:

- Electric vehicles: People believe that RUC would penalize fuel efficient transportation choices by electric vehicle drivers.
- Vehicle weight: There's concern that the RUC doesn't consider vehicle size and/or damage caused to roads by some vehicles. They believe that heavier vehicles, which impose more wear and tear on roadways, should pay more for use of the roads.

33 people described concerns about accountability for state tax spending.

- They are worried that RUC would just be another way to collect taxes and that they do not know where the money would go.
- There is concern that even if RUC was implemented, other transportation taxes (including the gas tax, but also tolls, car tabs, or other fees) would not change.
- People do believe in funding transportation infrastructure, but they perceive that more and more money is being collected.

30 comments were about **implementation**.

- This included concerns that the pilot was too complex and would be difficult to implement. Some people believe RUC is more difficult to understand than the gas tax, and the system would be administratively challenging to implement and may be too costly or unsuccessful when expanded to the entire state.
- People also offered ideas about implementation, which included fewer invoices, more communication, rewarding carpools, having more reminders to report mileage, and providing more data on costs of gas tax vs. RUC or what other drivers are paying.

21 people had **out-of-state reporting** concerns.

- Many want to ensure they are not charged when driving out-of-state.
- Others want to make sure that out-of-state visitors are charged when driving in Washington.
- Others do not want to charge out-of-state visitors because this could hurt tourism.

20 people described geographic or income equity issues.

- Geographic: Rural drivers need to drive more as part of their daily life, and there's a lack of adequate public transportation to enable some drivers to drive less.
- Income: There's concern that RUC would disproportionately affect those who are less able to pay higher taxes.

13 people indicated that **data was not available from their app**. They want to be able to access their driving data, but their data dashboard is blank.

10 people had **privacy/security concerns**. They are concerned that a RUC system would collect too much personal data from drivers.

10 people had **accuracy/compliance concerns**.

- They were concerned that their mileage was tracked incorrectly, and they would be over-charged.
- They were also concerned about enforcement and compliance, noting that the system could be exploited by people who would pay less than they should pay under the system.

9 people had comments about **costs** (mostly comparing gas tax to RUC and how much they would pay under each).

14 people had pilot questions, 15 people needed more information, 16 people noted that they support RUC, and 5 people never received any invoices.

64 people had other comments, many of which were "no comment" or "thank you" comments.

Survey 3 Results

INTRODUCTION

This document summarizes the results of Pilot Participant Survey #3. The survey collected information on participants' experience with the pilot and their perspectives about a potential road usage charge. The survey was available to pilot participants from February 7 to 24, 2019.

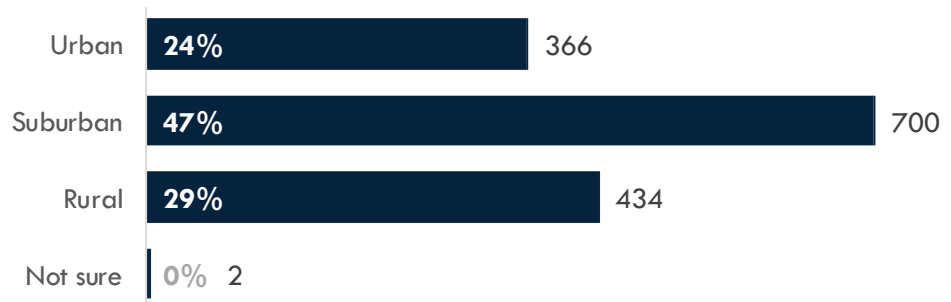
This was the third and final survey of the pilot. For questions asked in earlier surveys, comparisons are given to show how responses may have changed over time. The survey was distributed to 2,009 participants and 1,503 survey responses were received, for a conversion rate of 75%. Because some respondents skipped questions, some questions include a sample size (n) listed next to the question. Select questions were compared within a pool of participants to see if those who completed all three surveys were substantially different than participants who submitted fewer surveys; no significant change in results were found. An analysis of low-income individuals who indicated a household income of \$30,000 or lower is included following the all-respondent analysis.

SURVEY 3 RESULTS

About You

Survey questions and responses are shown in the exhibits below. Survey respondent information, such as self-described location and device type, are like earlier surveys.

39. How would you describe where you live? (n=1,502)

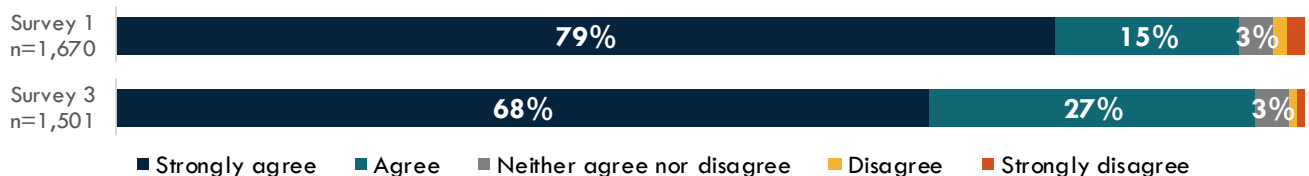


Source: BERK Consulting, 2019.

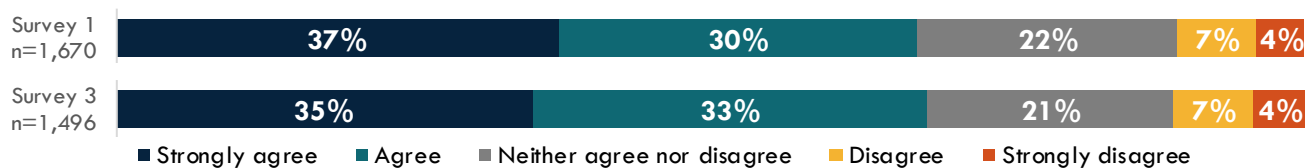
Transportation Funding

40. Please indicate your level of agreement with each of the following statements:

Washington State needs to ensure adequate funding is available to keep our transportation infrastructure safe, effective, and properly maintained.



Washington State needs to find an alternative to the gas tax to adequately fund our transportation infrastructure.



Source: BERK Consulting, 2019.

- Over the course of the pilot, participants who agreed that adequate funding for transportation is needed stayed about the same (94% in Survey 1 and 95% in Survey 3).
- Both at the beginning and end of the pilot, a majority agreed that the State needs to find an alternative to the gas tax.

41. What additional comments, if any, do you have about “adequate funding for WA transportation” or “finding an alternative source to the gas tax” that you would like to share? [Open-ended]

687 respondents provided open-ended responses. Responses may be assigned to multiple codes. Codes were developed as topics arose; not all codes were available when reviewing questions, and as such some may be underrepresented in counts.

- Participants care about funding transportation in Washington and shared their suggestions.**
 - 87 offered other **taxing or fee options**.
 - The most common idea was a state income tax, with an alternative being a tax on the wealthiest (highest income brackets) for infrastructure.
 - Other ideas were carbon fees, a sales tax with the purchase of a new vehicle, tires tax or tire surcharge, fees for studded tires, tolls on interstates, vehicle registration fees by weight, tax on luxury vehicles, using a formula that increases both miles driven and vehicle weight, congestion pricing, and business/corporate taxes.
 - There’s some interest in a tax mix that includes both a gas tax, a mileage-based charge, and vehicle weight.
 - 56 people stated that it is **important to fund** transportation in Washington.
 - 41 said that **an alternative to the gas tax is needed**, as current gas tax revenue is not keeping up with funding needs.
 - 22 stated that RUC revenue needs to be **dedicated or protected** to ensure it is used for transportation, rather than other purposes.
 - 13 people said that **bicycles should contribute too** since they also use the roads.
 - 11 people said that the state should invest in **public transit**.
 - 10 people suggested **increasing existing taxes or fees first (such as raising the gas tax)**.

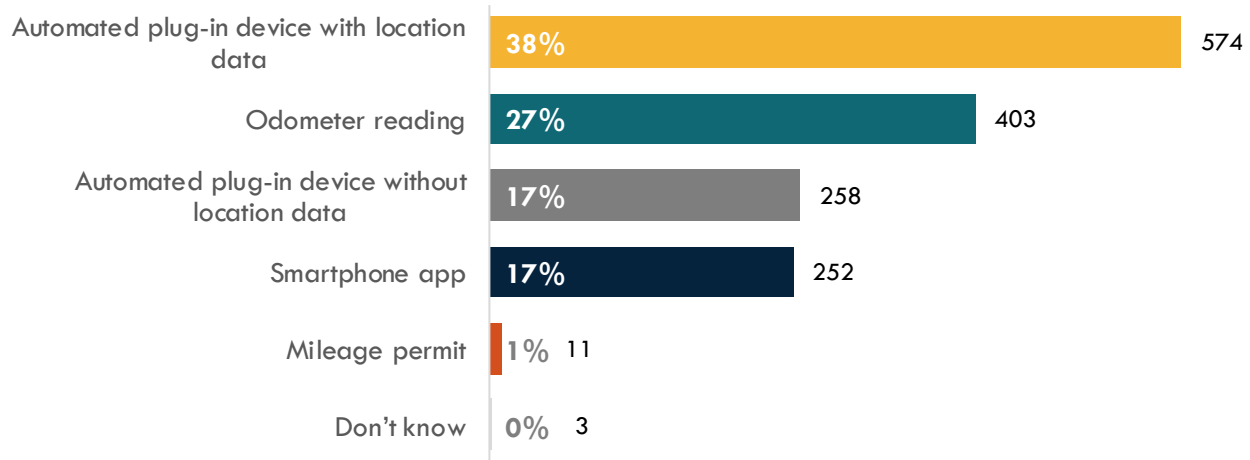
- 9 people brought up the **high costs of maintaining roads**.
- 4 people brought up questions about **federal funding**.
- 113 people have **general government, politics, or tax concerns**.
 - Of these, 49 people said they do not trust the government's use of tax money or stated that the government needs to use money more efficiently.
 - 26 people were concerned about the return on investment.
 - 24 people felt that the state has too many taxes or that taxes are too high already.
- **Participants have mixed opinions about how EVs/hybrid vehicles should pay.** Some feel strongly that **EVs/hybrids should also pay the same rate** for their use of roads, and others feel strongly that **they should be incentivized or rewarded for being fuel-efficient**.
 - 42 people said EVs/hybrids should pay too.
 - 30 people said there should be incentives for environmentalism or fuel efficiency.
 - 26 people said we should not discourage EVs/hybrids.
 - 13 people offered other ways to tax EVs/hybrids, including an additional registration fee for EVs/hybrids or an extra tab on their tab renewal. This is to make up for the costs they are not paying in gas tax.
 - 6 people said that they dislike the current flat-rate fee tax on EVs/hybrids.
 - 3 people perceive that EVs/hybrids would pay more under RUC than other vehicles.
 - 2 people said not to double tax EVs/hybrids.
- **Thinking about funding, participants are concerned about factors that may disproportionately affect costs or result in misalignment between payers and users.** Participants mentioned the relationship between income, geography, and driving distance.
 - 32 people mentioned **geographic considerations**. Funding should reflect the roads being supported by that funding. Most of these participants were concerned that rural areas would bear the transportation costs for urban areas. A few participants noted a need to fund large cities and growing urban areas.
 - 29 mentioned **vehicle weight**. These participants believe that heavier vehicles have more road impact than smaller vehicles.
 - 22 mentioned **income**. Income is related to other factors that drive costs. Lower-income households often live further from work, in locations with lower housing costs and would be disproportionately affected by a RUC. Additionally, lower-income families are less able to afford EV/hybrids, so the incentives that reward fuel-efficiency are harder to obtain.
 - 16 people commented that some people need to **drive further to work** or for daily needs. Some mentioned that this is the case particularly for those who live in rural areas or who have lower-incomes and may live far from job centers.
 - 14 mentioned **vehicle type**. They perceive that larger trucks and vehicles with studded tires damage the roads disproportionately and add to road maintenance costs.

- Participants offered ideas for implementation:
 - 20 people suggested implementing **both the gas tax and RUC**, or the gas tax plus some type of tax for EVs/hybrids.
 - 9 suggested implementing **variable road costs or tolls**.
 - 6 suggested implementing RUC for EVs/hybrids now (and potentially expanding it to other vehicles later).
- 26 stated that they **do not want to be double taxed**. If RUC is implemented, then the gas tax needs to be repealed. They are concerned that they may end up paying both.
- 22 commented about needing to track out-of-state use, with 13 saying that **non-residents should contribute for use of roads**. Others want to ensure residents are not charged for out-of-state driving.
- Participants described the way that people should be charged:
 - 49 said people should pay for use of roads.
 - 18 said people should pay for their impact on roads.
 - 11 said people should **pay if they benefit**. Everyone benefits from the roads even when they're not driving, whether it's through public transportation, carpooling, or biking. Some stated that all residents benefit, even if they do not use roads, for example, businesses or customers who purchase goods brought to stores or homes on trucks.
 - 10 said people should pay by the mile.
 - 8 said people should pay for their share.
- 13 people brought up the importance of **privacy and data security**, including 6 who were concerned about it and 2 that suggested non-tracking options.
- 9 people were concerned about **administration/overhead costs**.
- 9 people suggested a need for more **transparency or communications** if RUC is implemented.

Your Reporting Method and Provider

The mileage reporting method of survey takers is shown below. There were only 11 users surveyed who used the mileage permit method, so further analysis by reporting method may be less accurate because of the small sample size.

40. Which mileage reporting method did you test in the pilot? If you switched methods, please select the reporting method you most recently used. (n=1,501)

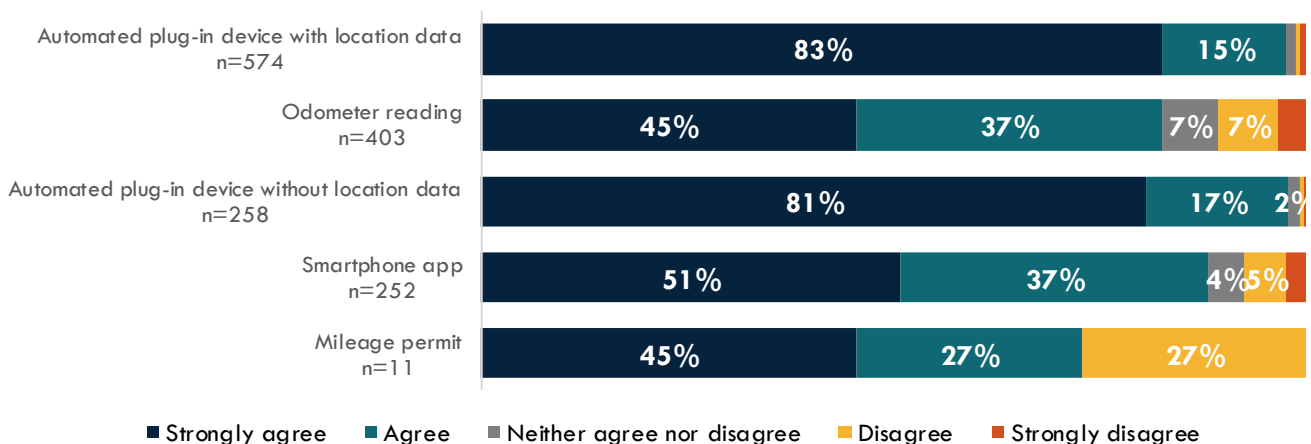


Source: BERK Consulting, 2019.

Most users reported that their reporting method was convenient and did not interfere with their ability to drive. The mileage permit participants disagreed with most with these statements, but this was a limited sample size of 11s. Most users also found that the reporting method did not interfere with their ability to drive.

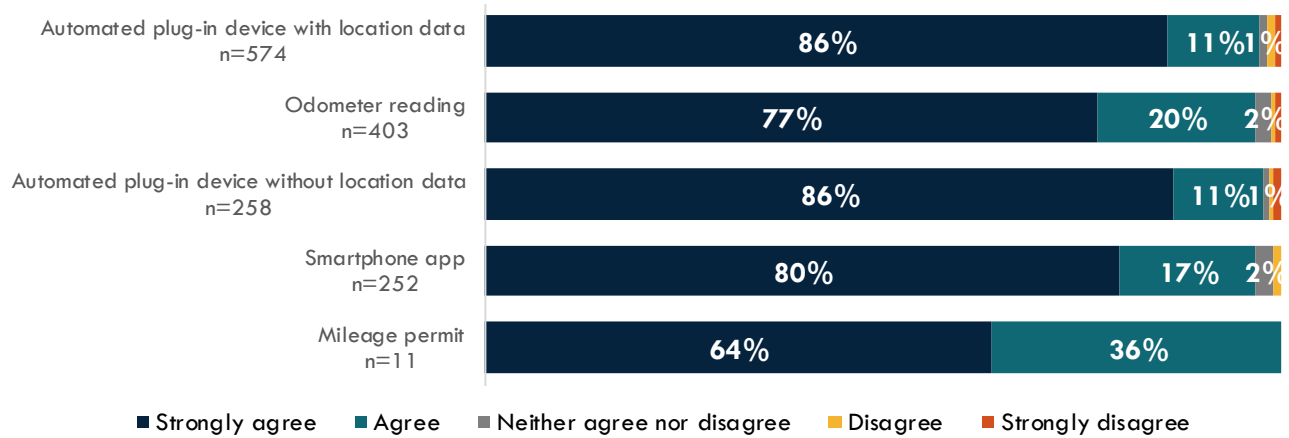
42. Please indicate your level of agreement with the following statements about your reporting method:

The reporting method was a convenient way to participate in the pilot.



Source: BERK Consulting, 2019.

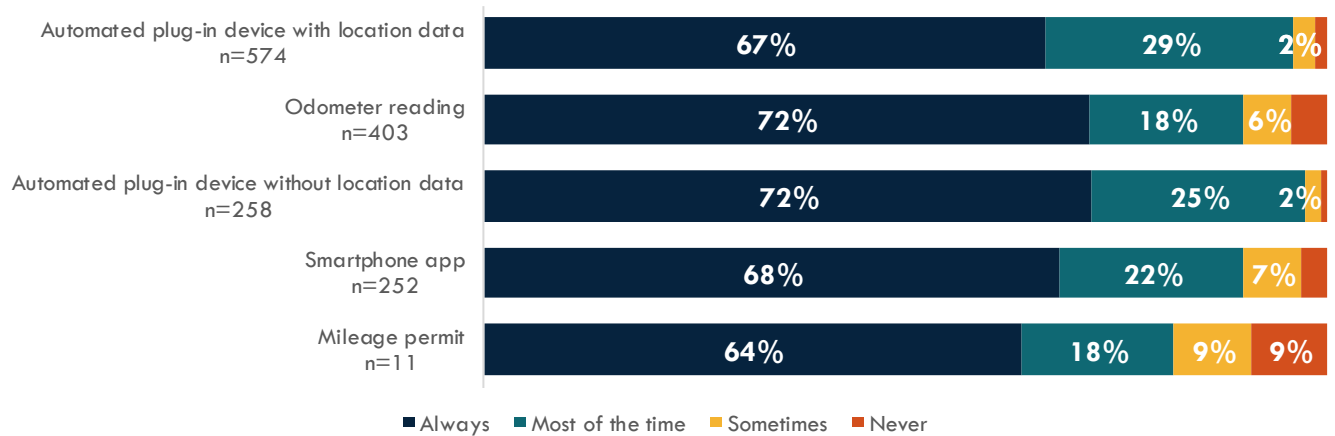
The reporting method did not interfere with my ability to drive.



Source: BERK Consulting, 2019.

Most users believed that their mileage was accurately reported.

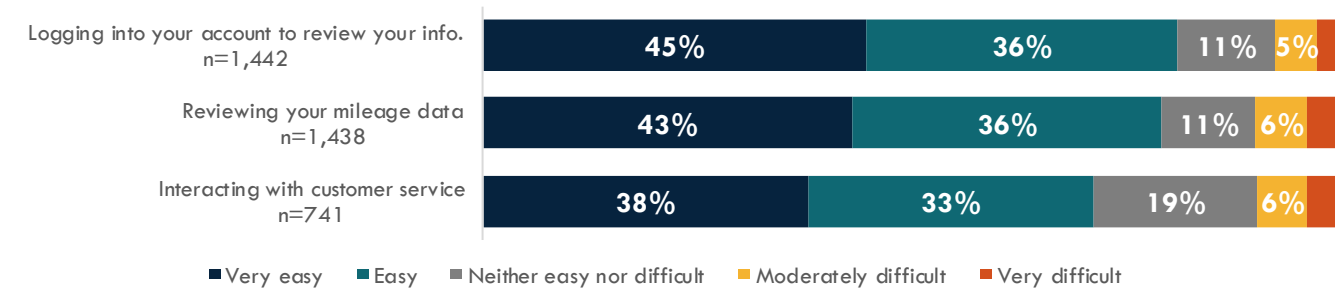
43. Did the reporting method accurately report your trips?



Source: BERK Consulting, 2019.

Most pilot activities were easy to complete. Over half of respondents did not interact with customer service.

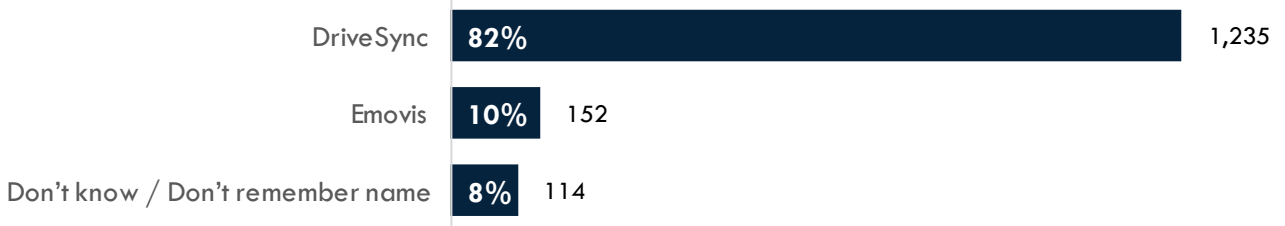
44. Please rate the following pilot activities in terms of ease of completion.



Source: BERK Consulting, 2019.

Most respondents used DriveSync during the pilot.

45. Who is your RUC Service Provider? (n=1,501)

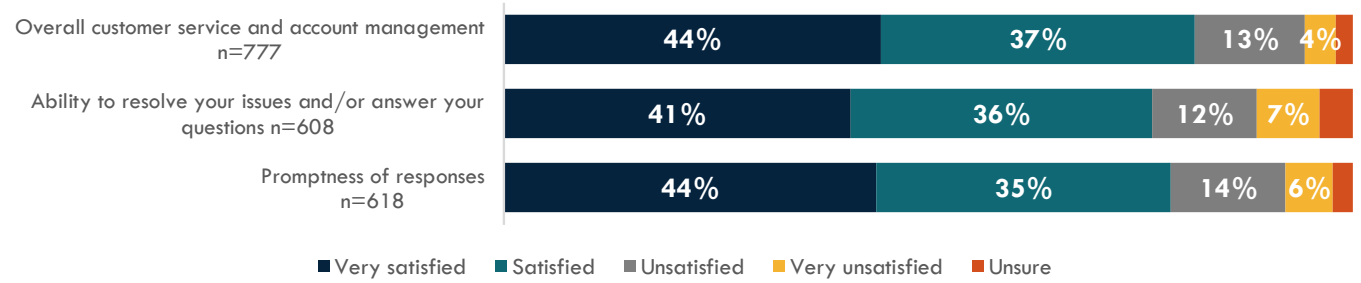


Source: BERK Consulting, 2019.

Over 70% of respondents were satisfied or very satisfied with their interactions with their RUC providers, as shown below.

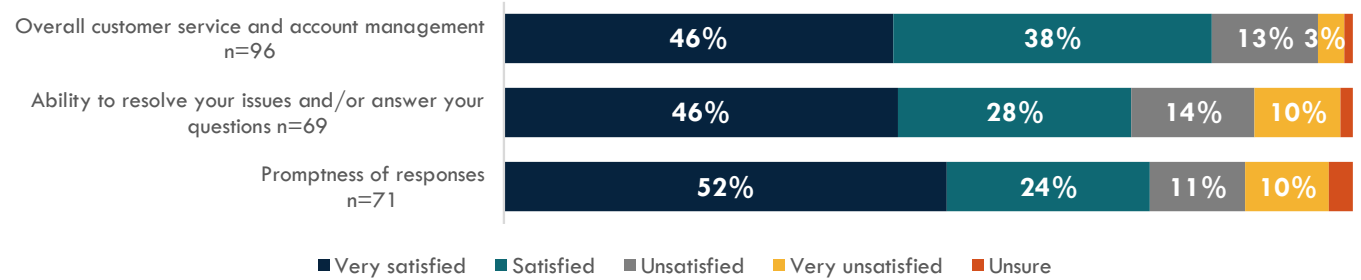
46. Please indicate your level of satisfaction with your RUC Service Provider for each of the following:

Provider: DriveSync



Source: BERK Consulting, 2019.

Provider: Emovis



Source: BERK Consulting, 2019.

The RUC Experience

Respondents had a strong level of satisfaction with their RUC pilot experience.

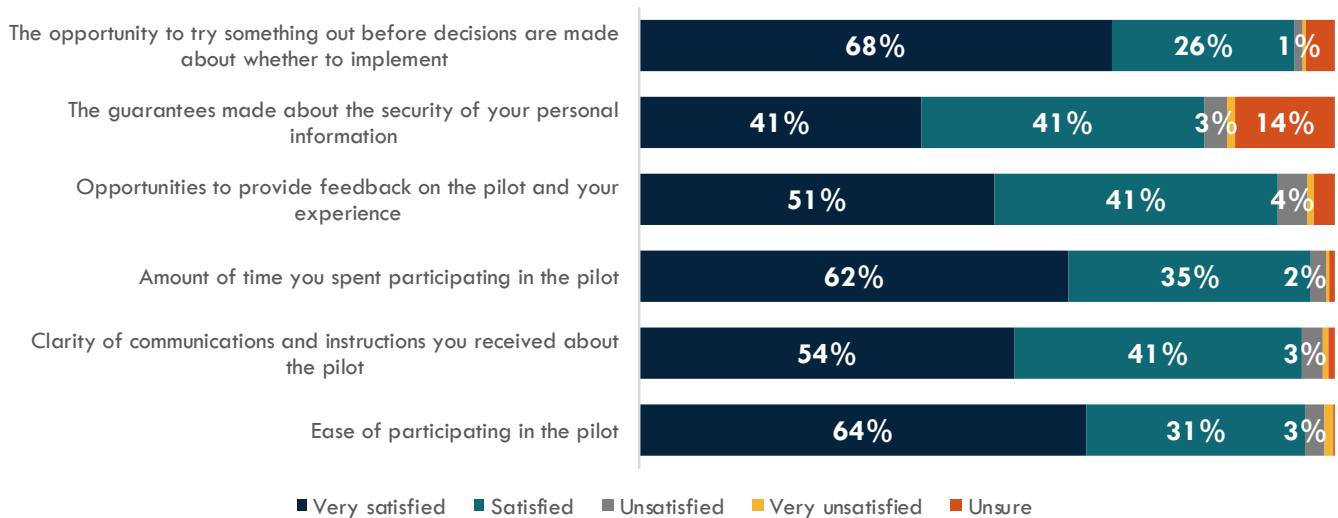
47. Thinking about your full experience with the RUC Pilot, how satisfied were you overall? (n=1,491)



Source: BERK Consulting, 2019.

While respondents were satisfied overall with specific RUC experiences, they were most unsure about security of their personal information.

48. Thinking about your specific experiences with the RUC Pilot, how satisfied are you with each of the following: (n=1,491)

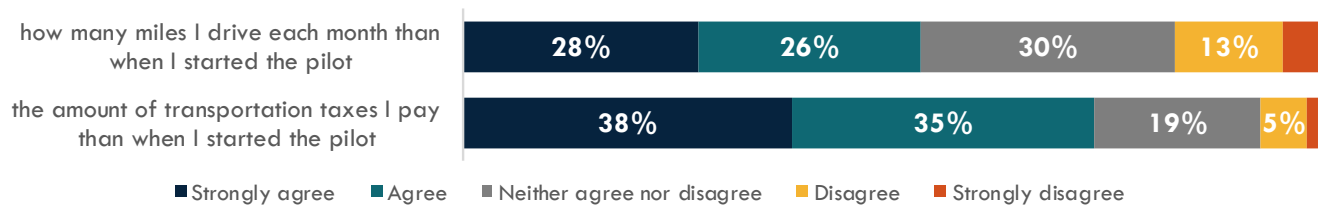


Source: BERK Consulting, 2019.

Most respondents became more aware of their miles driven per month, and over two-thirds became more aware of the amount they paid in transportation taxes.

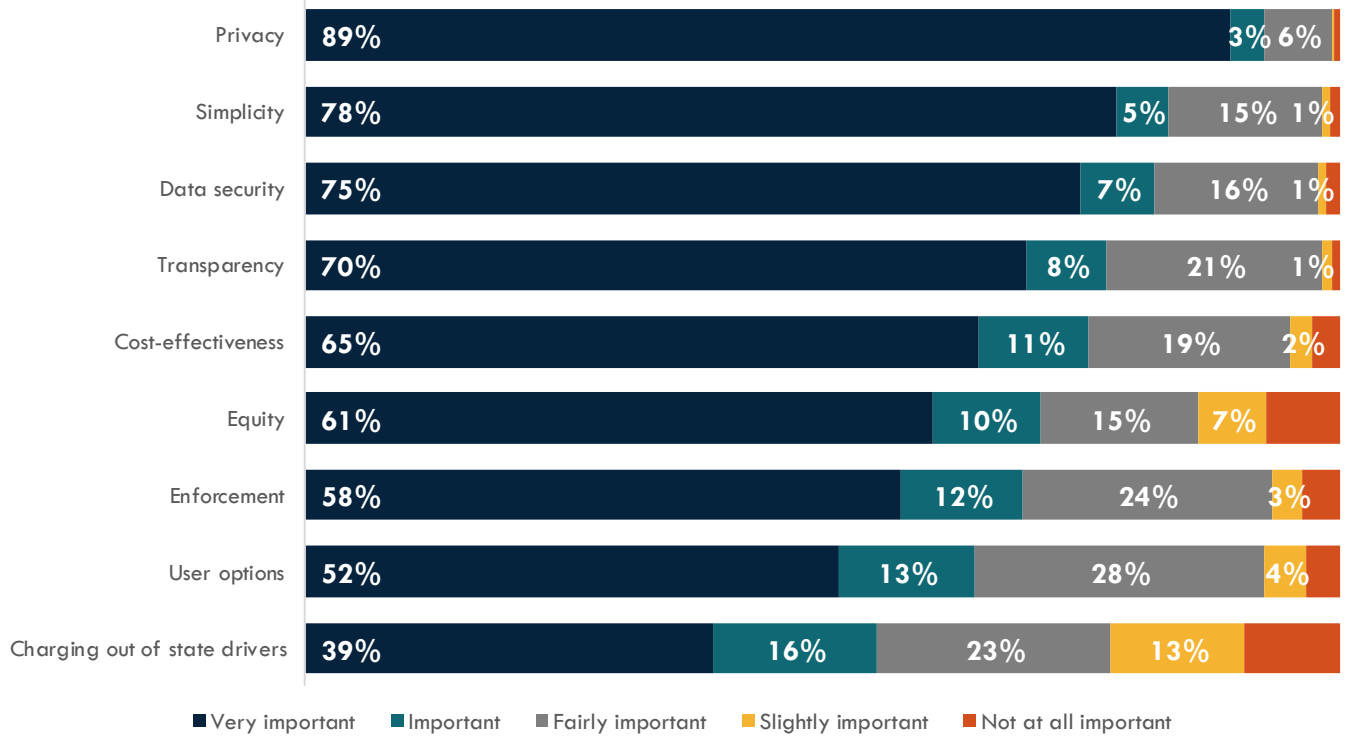
49. Based on your participation in the RUC pilot, please indicate your level of agreement with each of the following: (n=1,491)

I am more aware of:



Source: BERK Consulting, 2019.

50. How important to you are the following principles for a potential road usage charge system? (n=1,491)



Note: Survey respondents were presented with full statements defining these principles without the label that describes each statement. The principle label is presented here for simplicity. A complete list of principles and their definitions can be found below. The statements were presented in random order when participants took the survey.
 Source: BERK Consulting, 2019.

Survey takers were asked about guiding principles in all three surveys. Respondents selecting “very important” are shown for each survey. In the first and third survey, the guiding principle and definitions were shown, while the second survey only showed the definitions. Privacy was the most important principle across surveys. Only the share of people selecting “transparency” as a very important guiding principle went down over the course of the pilot.

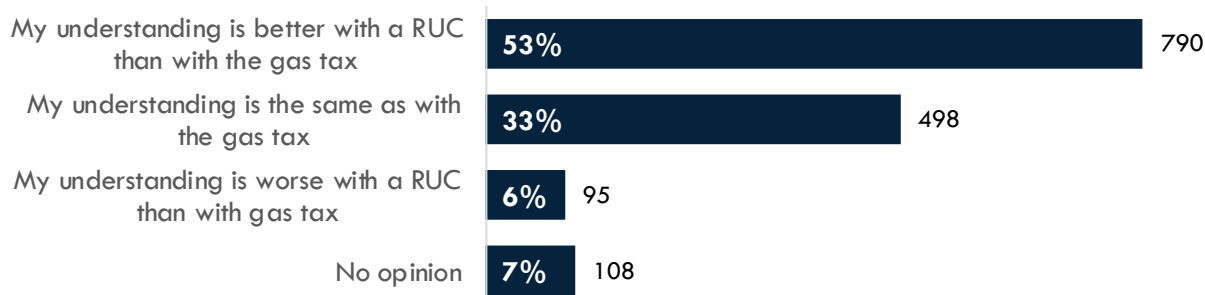
Share of Respondents Selecting Very Important by Guiding Principle Over Time

PRINCIPLE	DEFINITION	SURVEY 1	SURVEY 2	SURVEY 3	CHANGE (1 TO 3)
Privacy	My personal and driving information cannot be sold to any organization or shared with entities other than those directly administering a RUC system without my consent.	83%	90%	89%	6%
Simplicity	A RUC system is easy to participate in and not time-consuming to comply with.	70%	79%	78%	8%
Data security	A RUC system provides the highest level of data security possible and drivers can obtain information that clearly outlines the security measures.	74%	77%	75%	1%
Transparency	Clear information is available on the rate and how it is set, as well as RUC system operations.	75%	74%	70%	-6%
Cost-effectiveness	A RUC system is efficient for the State of Washington to collect, administer, and enforce.	62%	67%	65%	3%
Equity	All drivers pay their fair share based on how much they use the roads regardless of vehicle type.	59%	60%	61%	2%
Enforcement	A RUC system is easy to enforce, and costly to evade.	51%	57%	58%	7%
User options	A RUC system provides choices to drivers for how they report their miles.	43%	58%	52%	9%
Charging out of state drivers	Visitors to the state pay for their use of Washington roads.	32%	43%	39%	8%

Source: BERK Consulting, 2019.

Only 6% of survey respondents have a worse understanding of what their fair share of a transportation is under a RUC.

51. Based on the RUC invoices sent to you during the pilot, do you feel your understanding is now better or worse concerning what your fair share of the transportation tax is? (n=1,491)



Source: BERK Consulting, 2019.

About one quarter of survey respondents became much more supportive of a RUC, another quarter became a little more supportive, and just over a third did not change their attitude. About 16% became less supportive of a RUC after participating in the pilot.

Based on your experience in the pilot, how has your attitude towards a road usage charge system changed? (n=1,491)



Source: BERK Consulting, 2019.

52. If your attitude has changed, please provide any information on the reasons for this change. [Open-ended]

577 respondents provided open-ended responses. Responses may be assigned to multiple codes. Codes were developed as topics arose; not all codes were available when reviewing questions, and as such some may be underrepresented in counts.

Among the 164 respondents who are now **much more supportive of RUC** (and provided open-ended responses):

- 55 people said that the pilot was **informative**. They now know more about their individual use of roads, how transportation is funded in Washington, how much it costs to maintain the system, and how a RUC might work. Many noted that they now understand that vehicles with different mileage pay differently for the roads under the gas tax.
- 24 said that they now feel RUC is a **fairer** method of paying for the roads than the gas tax, because under RUC everyone pays.
- 19 were more supportive of RUC because they feel that **EVs and hybrids should pay for use of roads, too**. Some were previously unaware that EVs were not paying their fair share (in their opinion) under the gas tax. They believe RUC would be fairer by charging everyone, including

EVs, for their use of the roads in the same way.

- 17 said that they now **know more about their driving habits**. The pilot helped people see how much they were driving per day. After seeing how and where their money goes, and gaining knowledge of how they impact the roads, they are more supportive of RUC. Some drivers who believe they drive less than other drivers initially opposed RUC, but now feel that RUC would more accurately capture and charge for their use of roads.
- 16 noted that they **pay less under RUC**.
- 13 realized that the **costs they would pay under a RUC are similar to what they would pay under the gas tax**. They initially expected RUC to cost much more than a gas tax, but after the pilot realized that the differences were negligible.
- 8 said that under RUC everyone pays; everyone is treated equally.
- 7 said that the pilot was **transparent**; they were able to see exactly how many miles they drove, their costs under gas tax, and costs under RUC.

Among the 176 respondents who are now **a little more supportive of RUC** (and provided open-ended responses):

- 43 people said the pilot was **informative**. They now know more about how costs work under the gas tax and under RUC.
- 17 were more supportive of RUC because they feel that **EVs and hybrids should pay for their use of roads**. They now realize that under the gas tax, EVs and hybrids are not paying their fair share (as these respondents see “fair”).
- 13 realized that the **costs they would pay under a RUC are similar to what they would pay under the gas tax**.
- 13 said that they now **know more about their driving habits**.
- 12 said that under a RUC, **everyone pays for use of roads**.
- 10 people said they **pay less with RUC**. 9 said they pay more with RUC. Most of those who would pay more said that they are EV/hybrid drivers but still feel everyone should pay in the same way.
- 6 said the monthly reporting is **simple and easy**, though some suggested smaller monthly billings instead of quarterly.

Among the 41 respondents whose opinion is the **same as before the RUC experience** (and provided open-ended responses):

- Most had further unanswered questions, or still did not understand RUC. Some were supportive before and still are; others were opposed before and still are. Some had mixed feelings.

Among the 82 respondents who are now **a little less supportive of RUC** (and provided open-ended responses):

- 15 people said they **pay more under RUC**.
- 13 **had issues with technology, devices, or reporting**. This included the smartphone app or GPS plug-in not working, not reporting mileage accurately, or being difficult to use.
- 9 were concerned about **administration and overhead costs**. They perceive that RUC would be costly to administer.
- 9 had **general concerns with government, politics, or taxes**.
- 8 said the pilot was confusing, a hassle, or a poor experience.
- 7 were concerned about privacy and data security.
- 6 were concerned that it would burden EVs/Hybrids. They feel that RUC would penalize those with efficient vehicles.
- 6 said not to discourage EVs/hybrids.
- 5 noted that the costs were similar under a gas tax compared to RUC.
- 5 were concerned that some people drive further to work.
- 4 were concerned about geographic equity.
- 4 said it did not track out-of-state miles accurately.

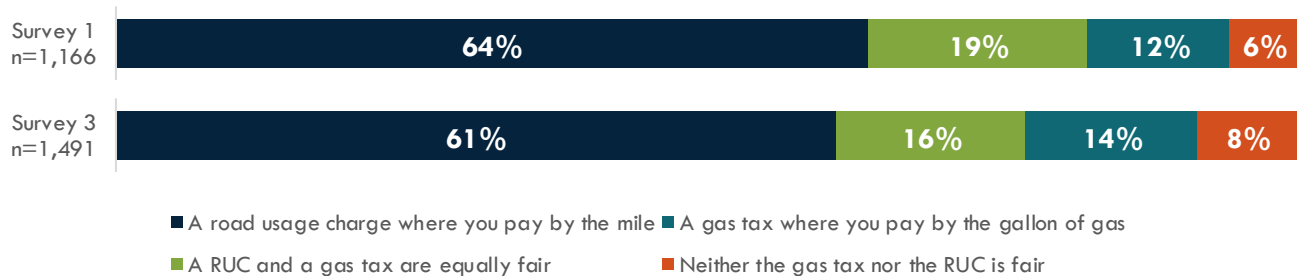
Among the 113 respondents who are now **a lot less supportive of RUC** (and provided open-ended responses):

- **The primary concern was that RUC would penalize or discourage EVs/hybrids**. 12 said not to discourage EVs/hybrids. 7 were concerned that it would burden EVs/hybrids. 8 said there should be incentives for environmentalism and efficiency.
- 19 said **they would pay more under RUC**.
- 18 have **general government, politics, or tax concerns**. This includes 5 people who don't trust government use of tax money, 2 people wondering about return on investment, 3 people who feel that there are too many taxes.
- 13 had **issues with technology, devices, or reporting**.
- 12 were concerned about **privacy or data security**.
- 12 said the pilot was **confusing, a hassle, or a poor experience**.
- 5 concerned about a new/additional tax.
- 7 people said they do not want to be double-taxed.
- 7 were concerned about administration and overhead costs.
- 7 were concerned about geographic equity.
- 6 had concerns with the payment and reporting schedule.

- 6 were concerned about equity by vehicle type
- 5 were concerned about income equity.
- 5 said it did not track out-of-state miles accurately.
- 4 were concerned about equity by vehicle weight.

Opinions on the fairness of each approach remained mostly consistent from respondents in Survey 1 and 3. 61% of respondents in Survey 3 said than a RUC is the fairer funding approach. While the share is lower than Survey 1.

53. Of the options listed below, which transportation funding approach do you think is more fair?



Source: BERK Consulting, 2019.

54. How do you define fair? [Open-ended]

1109 participants responded to this question. Responses may be assigned to multiple codes. Codes were developed as topics arose; not all codes were available when reviewing questions, and as such some may be underrepresented in counts.

- 472 people said fair means **being equitable**. Participants viewed equity from different lenses.
 - 143 discussed equity in terms of **vehicle type**. Different vehicle types impact the roads differently. Vehicle types also differ by income bracket, as lower-income families may only be able to afford outdated gas guzzlers.
 - 102 discussed equity in terms of **vehicle weight**. They were concerned that heavier vehicles may have a larger impact on roads.
 - 78 discussed equity by **income**. They were concerned that RUC could disproportionately impact low-income drivers.
 - 33 discussed equity by **geography**. They wanted to ensure that certain geographic areas are not more heavily impacted.
 - 30 discussed equity in terms of **environmental impact**.
 - 27 noted that **some drive further to work**. They did not want these drivers to be impacted more heavily by RUC.
- 367 people said fairness means **equal treatment**: treating people equally or treating people the same.
- **Most participants discussed fairness in terms of payment**, and that was framed in terms of

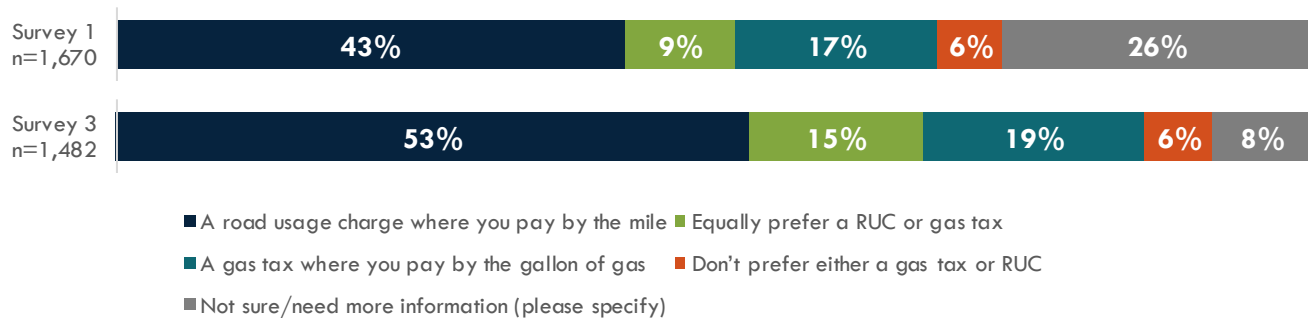
paying for use, for road impact, by the mile, your share, and/or paying if you benefit from roads.

- 435 defined fairness as **paying for use**.
- 214 defined fairness as **paying for road impact, damage, and upkeep**.
- 130 defined fairness as **paying by the mile**.
- 105 defined fairness as **paying your share**.
- 10 defined fairness as **paying if you benefit from roads**.
- 149 mentioned **EVs and hybrids** as an important factor to consider.
 - 104 said that EVs/hybrids should pay too.
 - 20 said not to discourage EVs/hybrids.
 - 10 said not to double tax EVs/hybrids.
- 51 mentioned **general government, politics, or tax concerns**.
 - 22 are interested in or concerned about return on investment.
 - 12 don't trust government's use of tax money.
 - 4 said there are too many taxes.
- 45 provided **implementation ideas**.
 - 18 suggested implementing both gas tax and RUC.
 - 6 suggested variable road costs/tolls.
 - 5 suggested starting with implementing RUC for EVs.
 - 5 provided technology, device, or reporting ideas.
- 43 discussed **funding transportation in Washington**.
 - 17 commented it is important to fund transportation in Washington.
 - 11 said that RUC revenue must be dedicated or protected.
 - 7 mentioned the costs of roads.
- 42 voiced **operational concerns**.
 - 18 responses were about not double taxing.
 - 6 r were about collection.
 - 6 were about distinguishing between work and personal vehicle use.
- 39 respondents brought up the need to have **incentives for environmentalism and/or efficiency**.
- 21 mentioned **out-of-state** drivers, including 12 responses saying that non-residents should contribute.
- 12 mentioned **cost effectiveness or price**.
- 12 simply said that it means **fair**.
- 11 mentioned **compliance**.

- 9 mentioned **autonomy or driver’s decision**.
- 8 mentioned **accuracy**.
- 7 mentioned an **additional or new tax**.
- 7 mentioned **privacy/data security**.
- Some participants provided overall opinions of support of/opposition toward RUC or the gas tax.
 - 29 oppose the gas tax, and 44 support the gas tax.
 - 10 oppose RUC, 26 support RUC, 1 was unsure.
- 6 asked more questions or wanted further research.

Transportation funding preferences across time are shown below. Just over one quarter of respondents in Survey 1 were unsure of their preferences, which makes sense given that the pilot had just started. Support for a RUC increased over the pilot and of Survey 3 respondents 53% preferred it among the options.

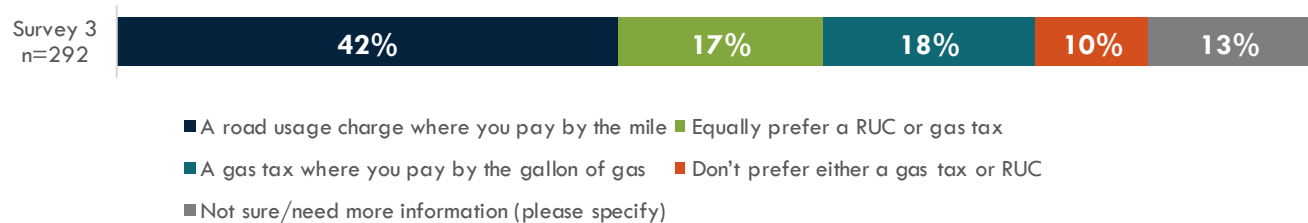
55. Fairness aside, knowing what you know today, which method to fund transportation would you prefer?



Source: BERK Consulting, 2019.

We looked at respondents who took Survey 1 and 3 to see how those who answered “not sure/need more information” in Survey 1 answered the same question in Survey 3. Of those who answered “not sure/need more information,” 42% ended up preferring a RUC, 17% equally preferred a RUC or gas tax, 18% preferred the gas tax, 10% preferred neither, and 13% were still unsure.

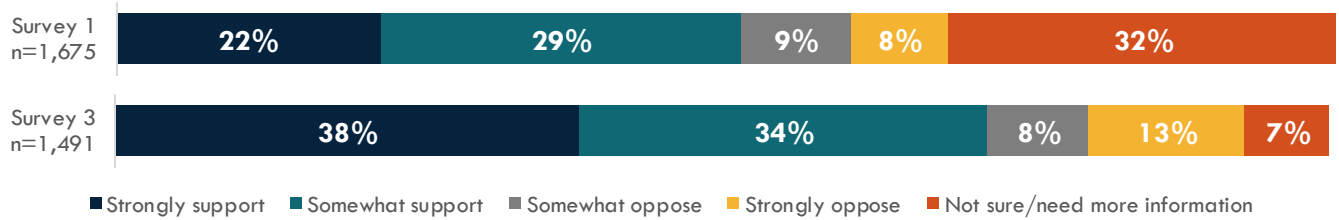
56. Funding preferences in Survey 3 for those that answered “not sure/need more information” in Survey 1 (n=292)



Source: BERK Consulting, 2019.

Respondents felt supportive of implementing a RUC as a gas tax replacement, with those saying they “strongly support” increasing over time and “not sure/need more information” decreasing.

57. At this point, how do you feel about implementing a road usage charge as a replacement to the gas tax in Washington to fund transportation infrastructure?



Source: BERK Consulting, 2019.

58. What additional comments, if any, do you have about implementing a road usage charge system as a replacement to the gas tax in Washington? [Open-ended]

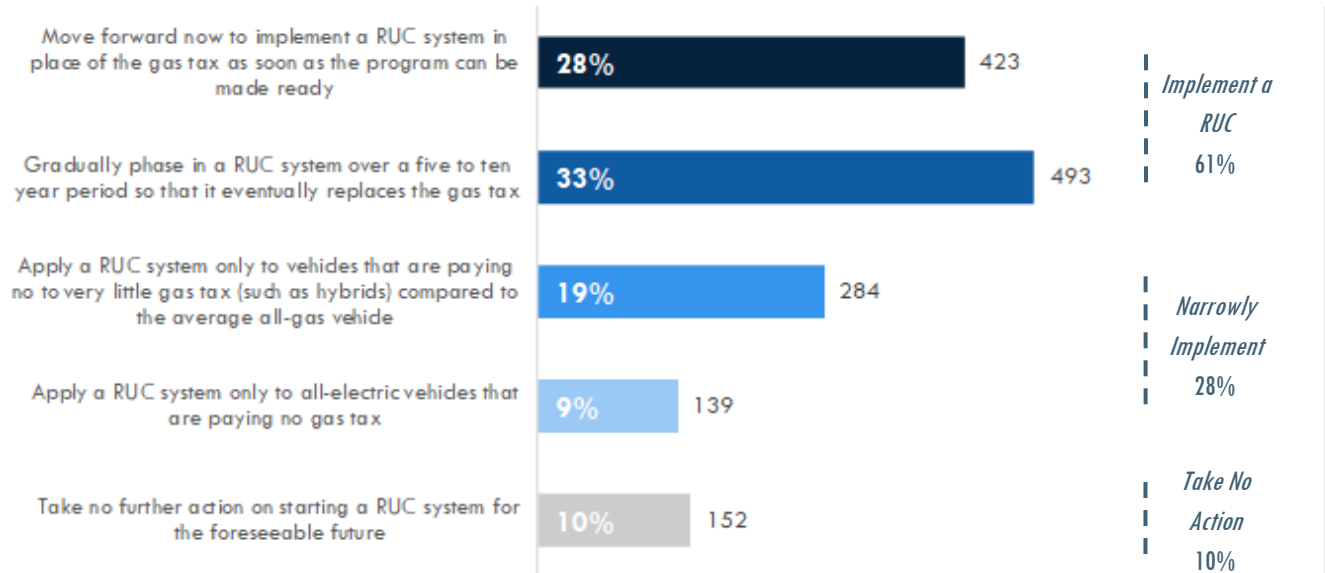
673 respondents provided open-ended responses. Responses may be assigned to multiple codes. Codes were developed as topics arose; not all codes were available when reviewing questions, and as such some may be underrepresented in counts.

- 78 raised questions or concerns about tracking out-of-state miles. **People do not want to be charged for their own out-of-state miles. However, some want visitors to Washington to pay for their use of Washington roads.** 17 people had questions about payment logistics.
- Participants are concerned RUC may **disproportionately affect lower-income individuals, who tend to live further away from work because of housing prices.**
 - 22 mentioned **income concerns**, 22 people mentioned **considerations for geography**, and 16 said that some need to **drive further to work**.
 - Participants do not want to punish those with low incomes, do not want people to end up in jail for not paying their RUC bill, or do not want to prevent people from driving if they cannot afford the bill.
 - Some described that budgeting for future payments, rather than paying at the point of sale (gas tax), is difficult for those who live paycheck-to-paycheck.
- **There are different opinions about how EVs/hybrids should pay.**
 - 31 said there need to be incentives for environmentalism and fuel-efficiency.
 - 19 said not to discourage EVs/hybrids.
 - 11 said that EVs/hybrids should pay too.
- 62 respondents were concerned about **being double taxed** or stated that they do not want to pay both RUC and gas tax. Some doubt that the gas tax would be removed if RUC is implemented.
- 51 want rates to consider **vehicle weight**, and 42 people want rates to consider **vehicle type or size**.
- 36 people had **general government, politics, or tax concerns**, including 24 who do not trust government use of tax money or believe the government needs to use money more efficiently.

- 35 people mentioned the importance of **transparency, communications, or public opinion**.
 - If RUC is implemented, there needs to be more transparency and communications with the public about how the money is collected and used.
 - **A media campaign** would help generate public buy-in and a more educated public.
 - Some speculated on whether there would be public support.
- 34 people were concerned about **administration/overhead costs**. Knowing more about these costs would affect how they feel about RUC. There was concern that third-party vendors would make a profit to administer RUC, or that gas companies will not reduce gas prices to levels without tax.
- 31 people mentioned **compliance or enforcement**. There are questions about how to ensure compliance and ensure people pay their share. Some believe taxes are easier to evade if they are not paid at the gas pump.
- 12 people mentioned technology, device, or reporting issues they encountered during the pilot.
- **Participants offered implementation ideas.**
 - 11 suggested starting with implementing RUC for EVs.
 - 9 suggested phasing RUC.
 - 5 suggested variable road costs or tolls, perhaps based on congestion or peak times.
 - 4 suggested limiting or capping RUC.
 - 2 suggested keeping but reducing the gas tax.
 - 2 suggested raising the gas tax now, then switching to RUC later.
- **Participants had some remaining questions**, including:
 - How will RUC affect car dealerships that currently fuel up cars?
 - How will the State handle lost revenues from gas use that is not on the roads, such as recreational vehicles, boats, lawn mowers, or other?
 - What happens when you sell a car?
 - How would this impact truckers and interstate commerce?
 - What would happen to Washington drivers' payment of the federal gas tax? What if the federal gas tax switches to a RUC?

Most respondents support moving forward to implement the RUC or gradually phasing it in. Only 10% of respondents said that elected officials should take no action to start a RUC in the foreseeable future.

59. Which of the following best represents your advice to elected officials as they consider the next steps in implementing a road usage charge system statewide: (n=1,491)



Source: BERK Consulting, 2019.

60. Do you have any final comments on your RUC pilot experience?

572 participants responded to this question. Responses may be assigned to multiple codes. Codes were developed as topics arose; not all codes were available when reviewing questions, and as such some may be underrepresented in counts.

- **Overall, participants were happy with the experience and enjoyed participating in the pilot.** They felt the pilot was informative and convenient. The most common challenges were related to the use of reporting devices and reporting.
 - 243 people provided comments saying good job, thank you, and/or that they were happy to participate.
 - 61 noted technology, device, or reporting issues.
 - 44 said the pilot was simple, convenient, and/or easy.
 - 43 felt the pilot was informative, whether they learned about their driving, how a RUC might work, or about transportation funding in Washington.
 - 20 provided specific comments about vendors.
 - 12 noted that the pilot was confusing, a hassle, or a poor experience.
 - 11 noted invoice issues.
 - 7 made specific comments about the surveys or focus groups.

- **Participants were interested in providing ideas on how to best implement RUC.** 69 people provided implementation ideas.
 - 22 provided ideas on how to improve technology, devices, and reporting.
 - 12 suggested phasing in RUC over time.
 - 9 suggested starting with implementing RUC for EVs, and then potentially moving onto other vehicles.
 - 3 suggested implementing both the gas tax and RUC.
- **42 people expressed care about equity, including different types of equity.**
 - 10 people wanted RUC to consider vehicle type, and 13 wanted to consider vehicle weight. Different vehicle types and weights impact the roads differently.
 - 8 brought up equity by geography, concerned that rural drivers face different challenges than urban ones.
 - 7 described considerations for income equity, concerned that RUC could disproportionately impact low-income drivers.
 - 3 mentioned that some people drive further to work and might be impacted more by RUC.
- 29 people stated general **concerns with government, politics, or tax money.** Of these, 7 said they do not trust government use of tax money, and 7 felt that there are too many taxes.
- 25 discussed **out-of-state drivers**, but from different angles.
 - 4 felt that the pilot did not track out-of-state drivers accurately.
 - 2 felt that it was easy to track out-of-state driving.
 - 2 were concerned that RUC would reduce tourists.
- 22 talked about **funding transportation in Washington.** This included 4 who stated it was important to fund transportation in Washington and 3 who stated that any RUC revenue must be dedicated/protected for transportation. This stems from concern that RUC revenue might be diverted to other purposes.
- 22 people noted the importance of **privacy.** Of these, 14 were concerned about privacy/data security, and 1 said they felt secure.
- 21 people brought up **EVs and hybrids.**
 - 8 did not want to discourage EVs/hybrids.
 - 1 did not want to double tax EVs/hybrids.
 - 4 expressed that EVs/hybrids should pay too.
- 16 people noted the importance of **transparency and communications.**
 - 4 of these people suggested that a **media campaign** would help with education and raise awareness about the RUC and transportation funding.
- 15 had operational concerns, which included 1 concern about collection, 11 about double taxing, 2 about traffic control.

- 14 people noted the importance of **accuracy**, including 10 people who were concerned about accuracy and 1 who felt miles reported in the pilot were accurate.
- 14 expressed interest in **incentives for environmentalism and efficiency**.
- Some participants provided overall opinions of support of/opposition toward RUC or the gas tax.
 - 13 stated they oppose RUC, 27 support RUC, 2 noted other useful impacts of RUC, and 1 person was unsure.
 - 2 stated they opposed the gas tax, and 3 stated they support the gas tax.
- 13 asked more questions or wanted further research.

Low-income Survey 3 Results

The following responses include only RUC pilot participants who indicated their household income was \$30,000 or less.

About You

Low-income survey respondents were less likely than all respondents to describe where they live as suburban.

61. How would you describe where you live?



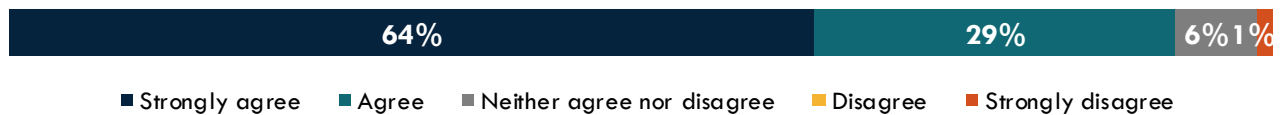
Source: BERK Consulting, 2019.

Transportation Funding

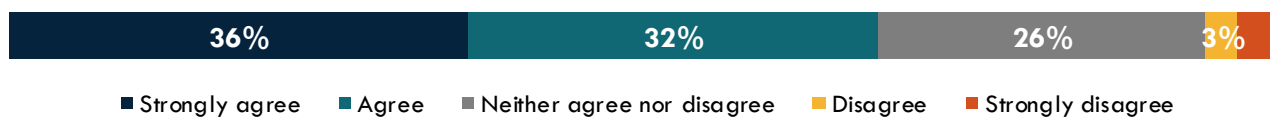
Low-income respondents' views on transportation funding were similar to responses from all respondents.

62. Please indicate your level of agreement with each of the following statements:

Washington State needs to ensure adequate funding is available to keep our transportation infrastructure safe, effective, and properly maintained.



Washington State needs to find an alternative to the gas tax to adequately fund our transportation infrastructure.

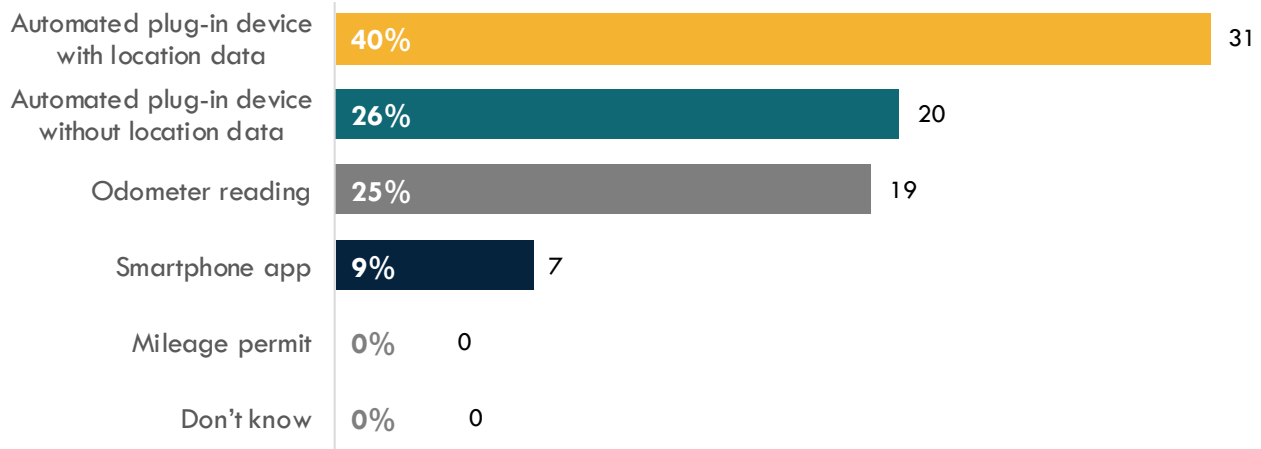


Source: BERK Consulting, 2019.

Your Reporting Method and Provider

Low-income users' device selections were similar to all participants, with a higher number of smartphone app users (17% of all respondents compared to 9% of low-income respondents). The mileage permit option was not selected by any low-income users.

63. Which mileage reporting method did you test in the pilot? If you switched methods, please select the reporting method you most recently used.

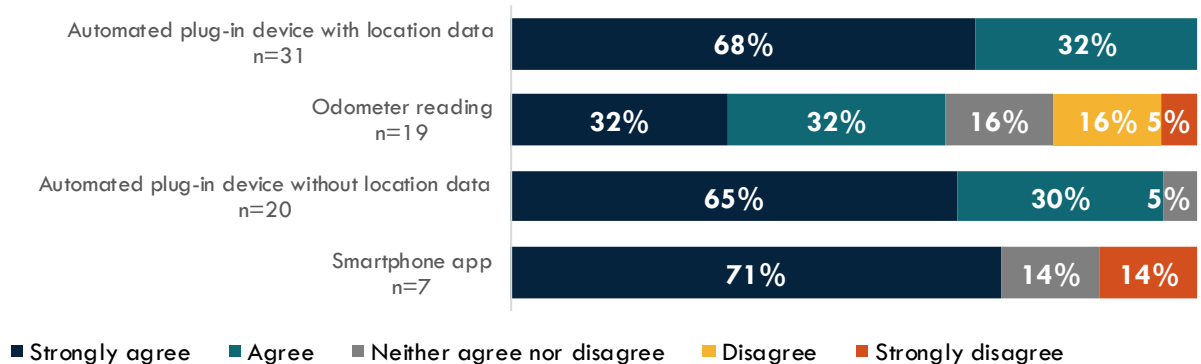


Source: BERK Consulting, 2019.

Most low-income users answered that their device was a convenient way to participate in the pilot and did not interfere with their ability to drive.

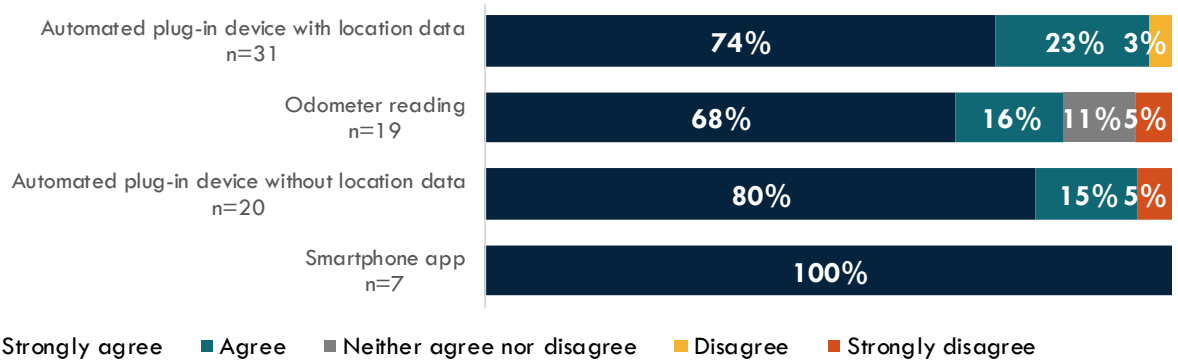
64. Please indicate your level of agreement with the following statements about your reporting method:

The reporting method was a convenient way to participate in the pilot.



Source: BERK Consulting, 2019.

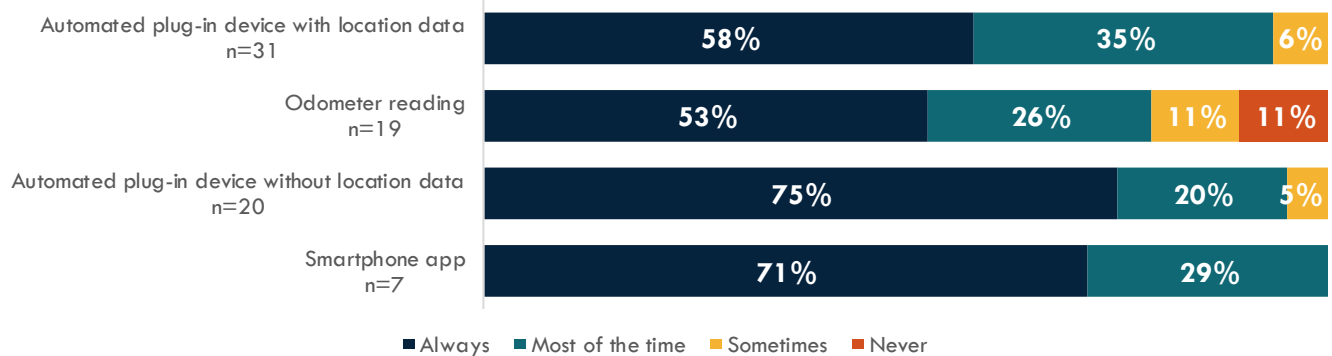
The reporting method did not interfere with my ability to drive.



Source: BERK Consulting, 2019.

Most low-income users answered that their reporting method was always accurate; however, the automated device with location data (67% all compared to 58% low-income) and odometer reading (72% all compared to 53% low-income) were lower than the all-respondent survey results.

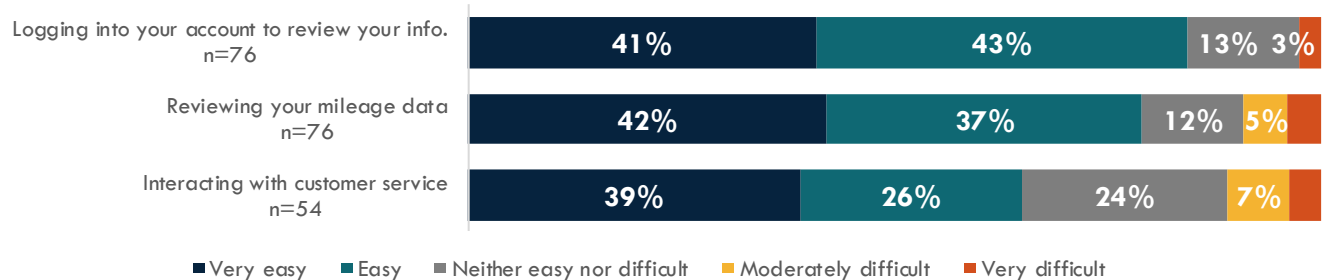
65. Did the reporting method accurately report your trips?



Source: BERK Consulting, 2019.

Most pilot activities were easy to complete, and low-income survey responses were similar to all-respondent survey responses.

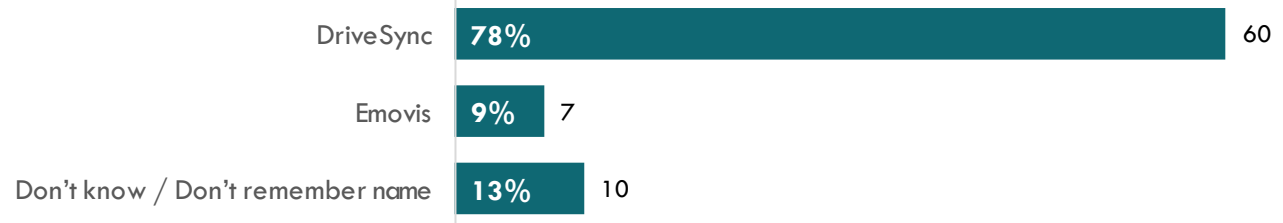
66. Please rate the following pilot activities in terms of ease of completion.



Source: BERK Consulting, 2019.

Most low-income respondents used DriveSync during the pilot.

67. Who is your RUC Service Provider?

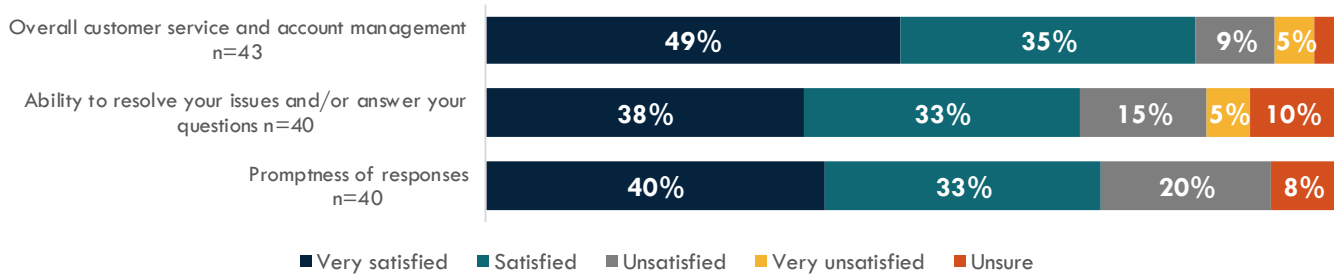


Source: BERK Consulting, 2019.

Low-income respondents were generally satisfied with their interactions with their service providers.

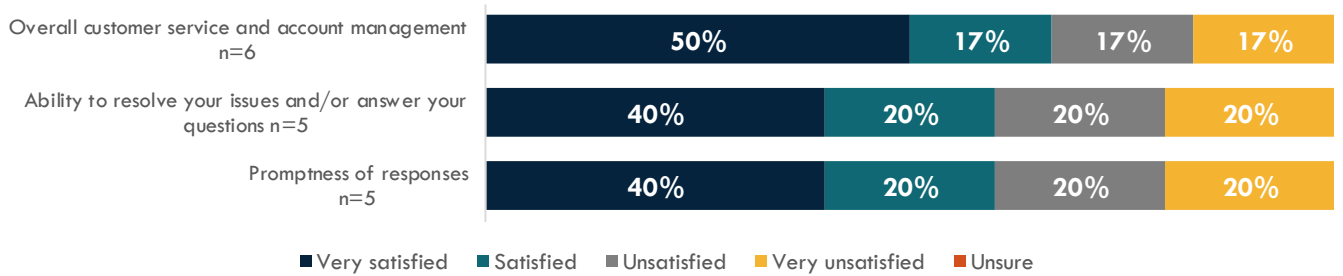
68. Please indicate your level of satisfaction with your RUC Service Provider for each of the following:

Provider: DriveSync



Source: BERK Consulting, 2019.

Provider: Emovis



Source: BERK Consulting, 2019.

The RUC Experience

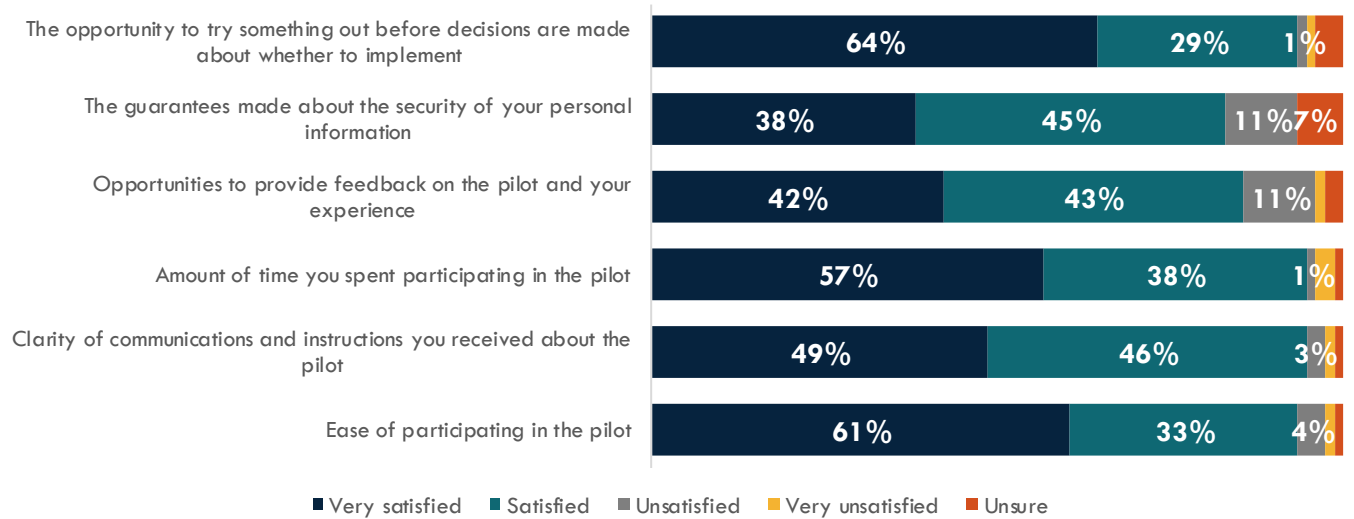
Low-income respondents had a high level of satisfaction with their RUC pilot experience, similar to all respondents.

69. Thinking about your full experience with the RUC Pilot, how satisfied were you overall?



Source: BERK Consulting, 2019.

70. Thinking about your specific experiences with the RUC Pilot, how satisfied are you with each of the following:

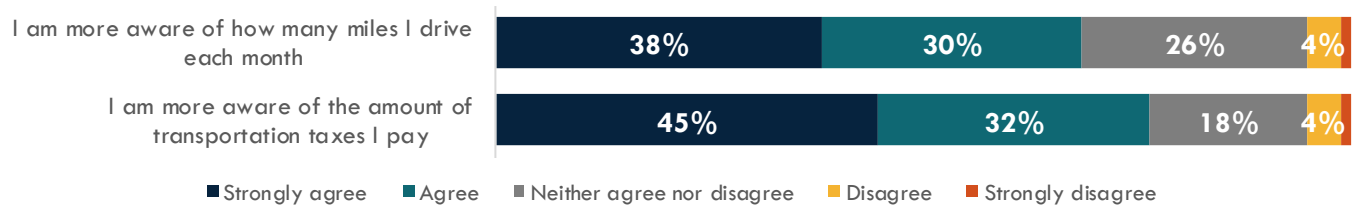


Source: BERK Consulting, 2019.

Low-income respondents said they were more aware of miles driven and transportation taxes paid, compared with the all-respondent group.

71. Based on your participation in the RUC pilot, please indicate your level of agreement with each of the following:

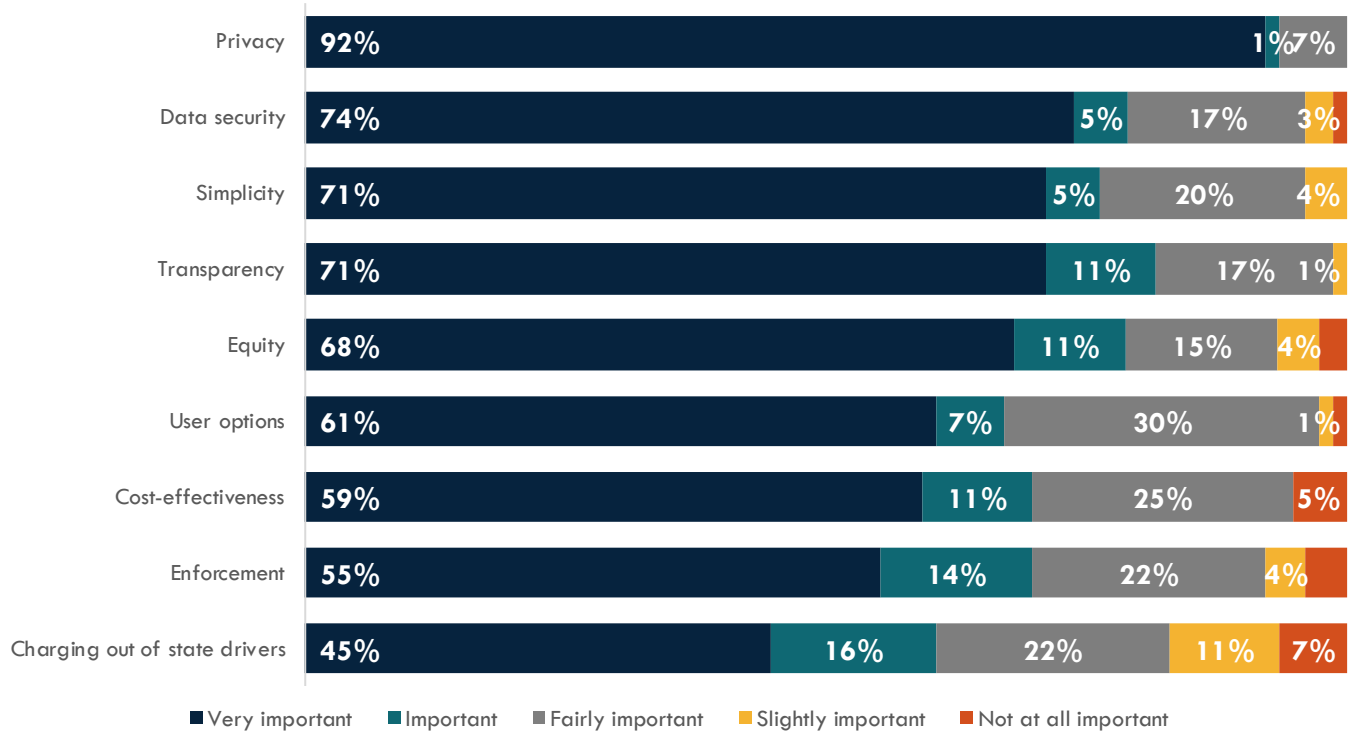
I am more aware of:



Source: BERK Consulting, 2019.

Low-income respondents' views on guiding principles were similar to all respondents, with equity seeing the largest difference between 61% of all respondents saying it's very important, compared with 68% of low-income respondents.

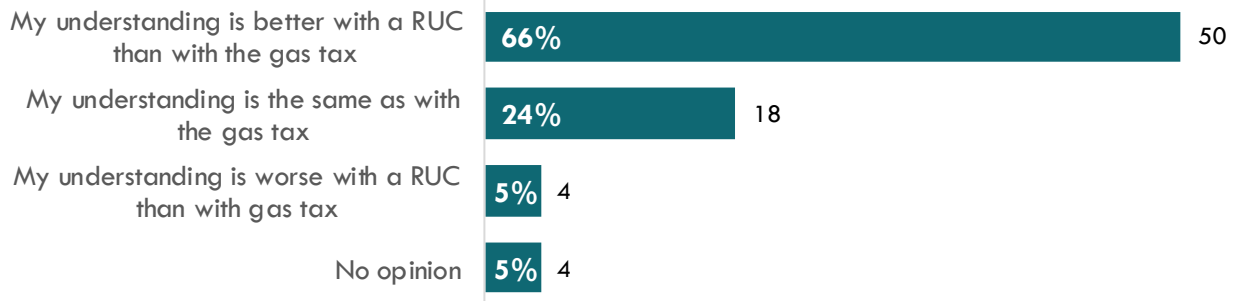
72. How important to you are the following principles for a potential road usage charge system?



Note: Survey respondents were presented with full statements defining these principles without the label that describes each statement. The principle label is presented here for simplicity. A complete list of principles and their definitions can be found below. The statements were presented in random order when participants took the survey.
 Source: BERK Consulting, 2019.

66% of low-income respondents have a better understanding of what their fair share of a transportation is under a RUC, higher than for all respondents (53%).

73. Based on the RUC invoices sent to you during the pilot, do you feel your understanding is now better or worse concerning what your fair share of the transportation tax is?



Source: BERK Consulting, 2019.

Half of low-income respondents became more supportive of a RUC based on their experience in the pilot, similar to the all-respondent response.

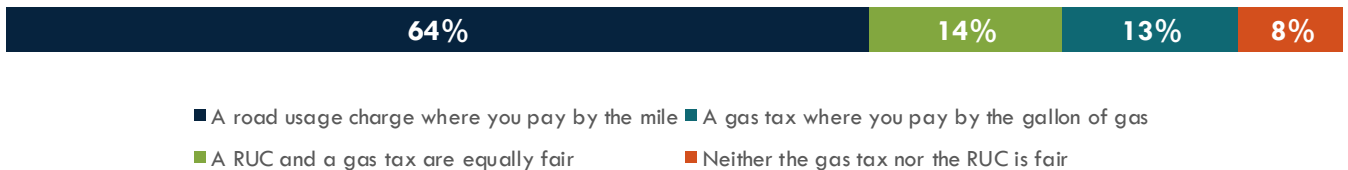
74. Based on your experience in the pilot, how has your attitude towards a road usage charge system changed?



Source: BERK Consulting, 2019.

64% of low-income respondents think a RUC is more fair, similar to the views of all respondents.

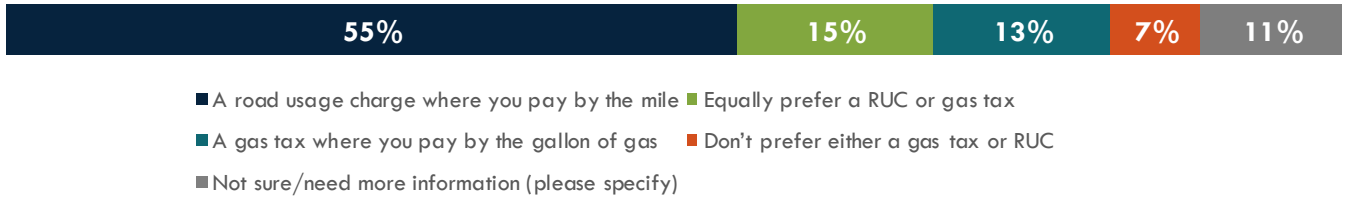
75. Of the options listed below, which transportation funding approach do you think is more fair?



Source: BERK Consulting, 2019.

Over half of low-income respondents would prefer a RUC to fund transportation, similar to the views of all respondents.

76. Fairness aside, knowing what you know today, which method to fund transportation would you prefer?



Source: BERK Consulting, 2019.

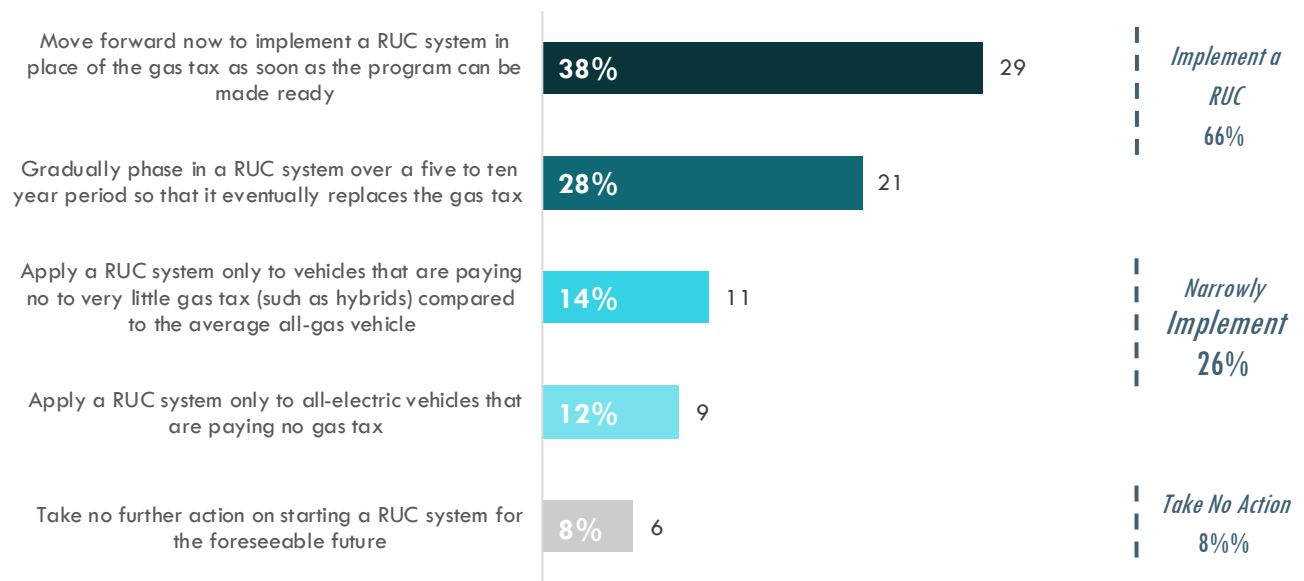
80% of low-income respondents support implementing a RUC as a replacement to the gas tax, compared to 72% of all respondents.

77. At this point, how do you feel about implementing a road usage charge as a replacement to the gas tax in Washington to fund transportation infrastructure?



Source: BERK Consulting, 2019.

78. Which of the following best represents your advice to elected officials as they consider the next steps in implementing a road usage charge system statewide:



Source: BERK Consulting, 2019.





A-3

FOCUS GROUP RESULTS

 **WA RUC**

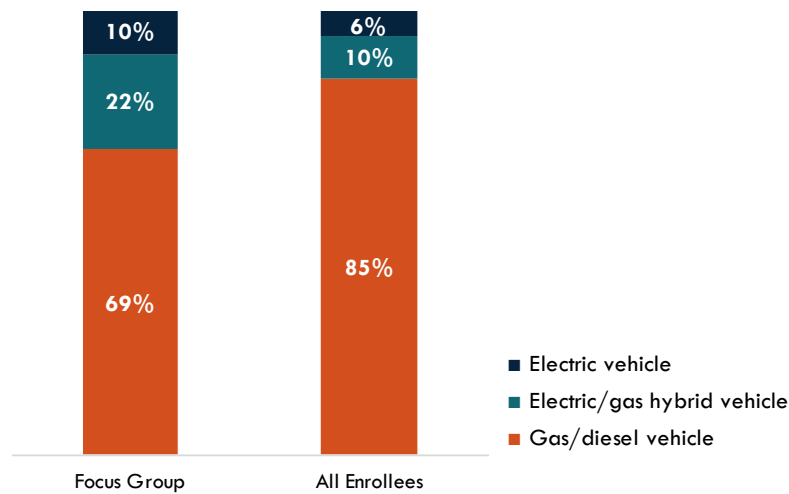
Appendix A-3: Focus Groups

The participant focus groups explored perceptions on topics such as RUC equity relative to gas taxes, privacy protection, data security, and ease of participation and compliance. These discussions complemented the surveys sent to all approximately 2,000 participants by providing more depth into the “what, how, and why” of participant perceptions.

PARTICIPANT CHARACTERISTICS

All pilot participants provided information during a pre-enrollment questionnaire and as part of the pilot project’s voluntary surveys. A comparison of characteristics between focus group participants and overall participant pool is summarized in Exhibit 1 through Exhibit 8. When an individual enrollee’s information is unavailable, they are not counted in the share of enrollees shown in the comparison results.

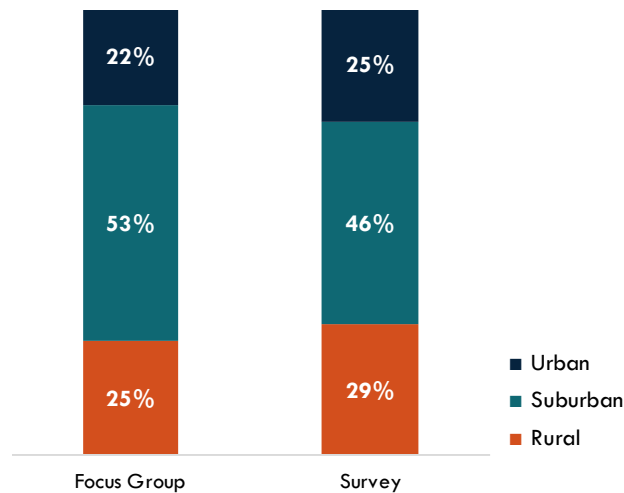
Exhibit 1. What kind of vehicle did you enroll in the WA RUC pilot?



The share of participants enrolled an electric or hybrid vehicle is greater in focus groups than among all enrollees (32% compared to 16%).

NOTES:
Focus group n=51
All enrollees n =1,936

Exhibit 2. How would you describe where you live?



The distribution of where participants live is similar between focus group participants and survey participants.

NOTES: The survey question response represents 83% of all pilot participants.
Focus group n=51
Survey 1 n =1,607

Exhibit 3. On average, how many miles a year do you typically drive?

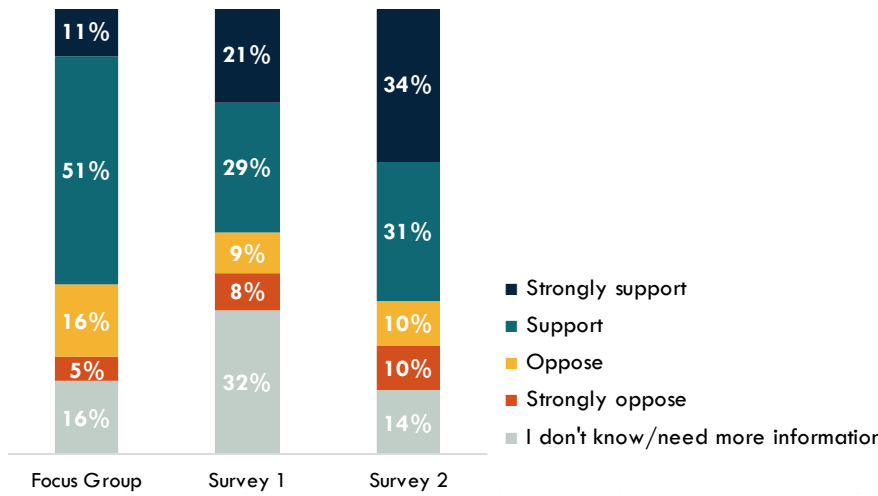


The share of people who drive 15,000 miles or more per year is higher in focus groups than among all enrollees (29% compared to 18%).

The share of people who drive fewer than 5,000 miles or less per year is similar across both the focus groups and among all enrollees (10% compared to 12%).

NOTES:
Focus group n=51
All enrollees n =1,930

Exhibit 4. What is your current opinion on a road usage charge as a way to pay for Washington State roads?

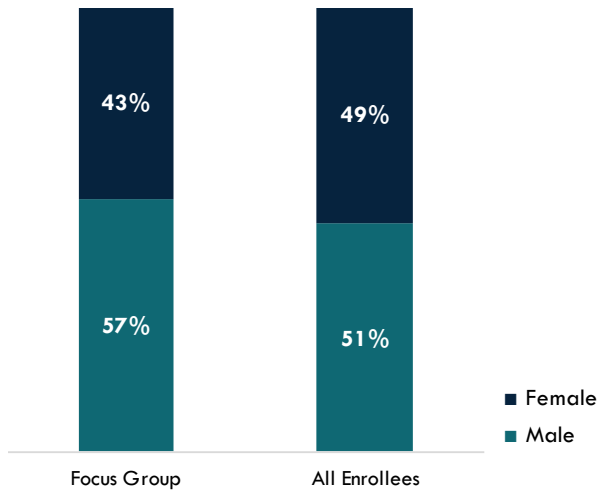


The share of people who support or oppose a RUC is similar in focus groups and survey participants.

Over the pilot, participants have become more supportive of a RUC (from 50% to 65%) and less uncertain. There is a stable cohort who oppose a RUC in the surveys (17%-20%) and 21% in the focus groups.

NOTES: Response rates were 84% and 81% for Surveys 1 and 2 respectively.
 Focus group n=51
 Survey 1 n =1,635
 Survey 2 n =1,572

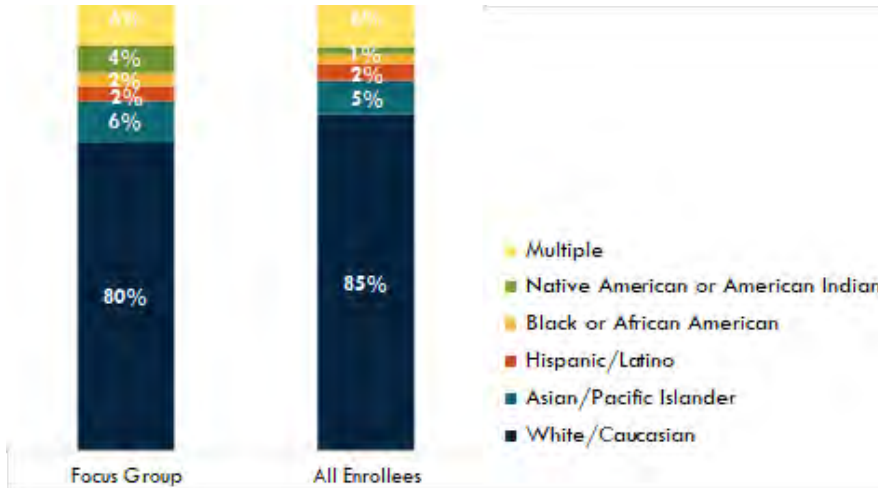
Exhibit 5. What is your gender?



57% of focus group participants, compared to 51% of all enrollees, identify as male. 43% of focus group participants, compared to 49% of all enrollees, identify as female.

NOTES:
 Focus group n=51
 All n =1,914

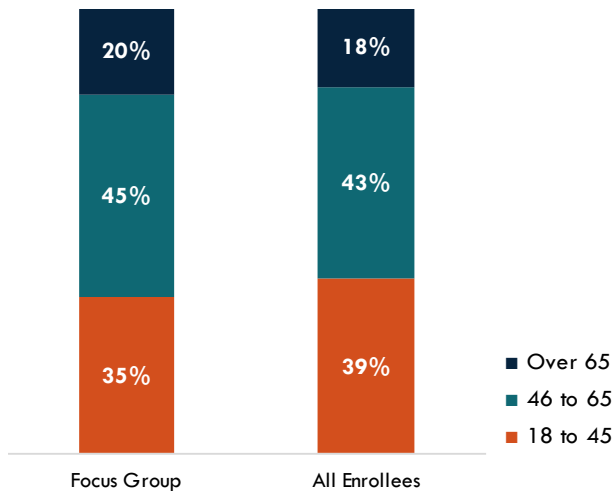
Exhibit 6. Which of the following do you identify with? Check all that apply.



20% of focus group participants, compared to 15% of all enrollees, identify as people of color.

NOTES:
Focus group n=50
All n =1,841

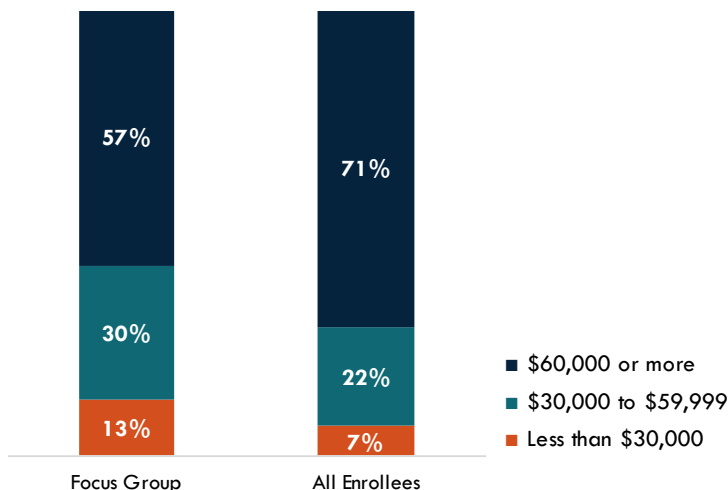
Exhibit 7. What is your age?



Age distribution was similar across both groups.

NOTES:
Focus group n=51
All n =1,937

Exhibit 8. What is your annual household income?



The share of participants reporting a household income under \$30,000 is greater in focus groups than among all enrollees.

NOTES:
Focus group n=51
All n =1,837

OTHER FINDINGS

Privacy and Data Sharing

Some participants were concerned about privacy and/or sharing data with the government, while others were not. Primarily participants concerned with privacy had questions about how and with whom the government might share their data. Many of these participants support offering reporting options that do not collect location information or additional personal data, with the ability for users to control the information they share.

- **Reasons for concern:** Want the ability to not share their data. Do not want to share data with car insurance companies and law enforcement. Worried about public disclosure laws.
- **Reasons not concerned:** Currently give data away with smartphones, and other programs, and to many companies. Appreciated the added benefits that the private vendor offered, such as driving behavior scores.

Fairness and Equity

Fairness and equity arose in each of the focus groups. Participants discussed and debated whether a RUC or a gas tax is more fair. People seemed to think that the RUC is slightly more fair than the gas tax but would be harder to implement and administer. Participants also discussed what factors should be included in fairness and equity, and what fairness means to them. Definitions of fairness included that all vehicles pay, that it accounts for income, and that everyone pays for what they use. Participants brought up the following issues in considering fairness in a RUC.

- **Vehicle type.** A RUC is more fair between gas and electric/hybrid vehicles because it separates fuel consumption from road usage. However, some worry that a RUC may discourage drivers from purchasing electric or hybrid vehicles because they would save less on gas tax. Some commented that hybrid/electric vehicles already pay a higher registration/ renewal fee than gas vehicles.
 - *I would not pay the expense to get a more fuel-efficient vehicle because I would save less.*
- **Low- or moderate-income individuals.** In Federal Way, some participants described how low- and moderate-income individuals and households are priced out of certain communities, and therefore drive further for work, to reach services, and run errands.
 - *My first impression of RUC was, how are lower income people going to be able to live? I thought poorer people would be charged more. People with lower incomes can't afford to get their cars fixed. My view has changed, but I was first concerned if I was going to be able to live here.*
 - *A road usage charge is different from a gas tax. For low income people, I must move further and further away to afford a place to live, and I also have to drive more to reach health care providers.*
- **Vehicle weight and studded tires.** Participants in Vancouver and Yakima mentioned that vehicle weight should be a factor in determining a RUC, as heavier vehicles or those with studded tires cause more damage to the road. Participants tended to think about impacts to the roads in terms of physical, such as wear and tear, rather than spatial or temporal due to limited right of way, which results in congestion.

Road Usage Charge Amount

- Most focus group participants would pay slightly more with a RUC compared to the current gas tax (if the amounts were equivalent as in the pilot), but many felt it was not too expensive at only a few more dollars per month. This amount was acceptable to most participants, including the low- and moderate-income group, hybrid/electric vehicle group, and rural/high mileage group. One participant expressed concern about who will decide when and how much the charge is increased.

Transportation Funding

- Most participants did not know either the current Washington state or federal gas tax rate. Only in Spokane did most participants correctly note the current gas tax rates.
- Most participants were unaware of what gas tax revenue currently pays for. Of those that knew, they mentioned maintenance and construction of state roads and bridges. Operations of Washington State Ferries was mentioned by one individual. No one mentioned policing of state roads.
- Some believe that money is wasted on transportation and the Legislature will not spend the funding wisely. Others were concerned that the money would be spent only in Western Washington.

Driving Behavior

A few participants noted that the pilot project changed their driving behavior. The most frequently mentioned reason for driving behavior changes was the plug-in recording device that calculated driving scores based on safety (as opposed to the amount of the invoice) . Most participants continued driving as usual.

There were several *potential* behavior changes mentioned by low or moderate-income participants. In areas like Seattle where it is more expensive to live closer to employment hubs, low-income individuals felt they might have to pay more under a RUC due to long commutes.

Participants mentioned the following driving behavior changes:

- More aware of driving behavior from my drive scores.
- Took fewer trips, driving less.
- Started looking for a job near my house, became more conscious.
- Take the shorter route on Google maps (even if it's slower).



A-4

HELP DESK SUMMARY

 **WA RUC**



WASHINGTON ROAD USAGE CHARGE PILOT PROJECT

PHASE 1 AND 2 HELP DESK COMMUNICATIONS
SUMMARY

PREPARED BY:



enviroissues

EXECUTIVE SUMMARY

The WA RUC Pilot Project team met their recruitment goal of building an interest list with over 5,000 members. This helped ensure that the recruitment and enrollment phase prior to the test-driving phase was successful in terms of enrolling 2,000 drivers who were representative of the demographics of Washington state. While a majority of the communications received during these phases came from enrolled participants, a significant number of communications came from members of the general public (62% and 38% respectively) which shows that the people of Washington have a growing interest in many of the topics associated with road usage charging.

As shown in the table *Phase 2: Distribution of communication topics in relation to participant distribution in percent (pages 17 and 18)*, the number of trending topics brought forth to the help desk varied greatly by region. The East region of the state had the largest number of communication topics that exceeded the anticipated percentage based off the participant distribution. This could indicate that drivers in Eastern Washington were particularly engaged throughout the pilot project. Additionally, the Central and Puget Sound regions had the least number of trending topics amongst the regions (two and zero respectively). This could indicate that these regions were not as engaged with the help desk throughout the pilot project.

The table *Phase 2: Distribution of communication topics in relation to MRM distribution in percent (page 22)*, shows that participants using the odometer reading method contacted the help desk with the highest number of topics. Many of the topics regarded technical questions suited for service providers or logistical questions regarding a RUC. This could mean that these users had more questions or uncertainty about their MRM, indicating that a clearer explanation of this method needs to be shared with the public, in addition to more targeted information on a RUC policy.

In conclusion, there are several distinct demographic groups that had specific interests in certain communication topics. If a future RUC policy were to advance, special consideration is needed to ensure the needs of these groups are met. While age and income demographics were not analyzed in this report, those variables could be analyzed further to provide more information on how they impact the needs of drivers in the future.

WA RUC PILOT PROJECT COMMUNICATIONS SUMMARY

The Washington Road Usage Charge Pilot Project kicked off recruitment in August 2017. By the end of the test-driving phase of the pilot project in February 2019, the project team heard from over 1,200 members of the public and received nearly 2,000 communications via phone or email.

The following is a summary of the feedback received by the WA RUC help desk for each phase of the pilot project. During these periods, communications were received via email or phone. Communications address a range of topics and often discuss more than one topic; therefore, many communications may be categorized under multiple topics in the database.

Phase 1: Recruitment and Enrollment

The first phase of the pilot project involved recruiting members of the public to participate in the pilot project. The project team reached out to residents in every corner of Washington through a variety of media outlets. The project team also reached out to drivers in Idaho, Oregon, and Surrey, British Columbia who live near the border and frequently travel into Washington. In total, nearly 5,000 individuals showed interest in participating in the pilot project by signing up on the project's interest list via the WA RUC Pilot website.

Recruiting participants

The project team developed a communications and outreach strategy to ensure volunteers recruited for the test-driving phase of the pilot project would represent the geographic and socio-economic diversity of the state.

At a high-level, the goals for recruitment were:

- Represent the geographic and socio-economic diversity of the entire state and region.
- Provide equitable access for participants to sign up, enroll and complete the pilot.
- Identify, communicate and mitigate risks that could negatively impact the experience of pilot participants.
- Build a broad understanding of working expectations for recruitment among stakeholders, including the private sector and businesses, and other agencies and organizations.

The project team developed press releases, display ads, e-newsletters, radio advertisements, and more to create a pool of interested individuals throughout Washington.

Recruiting participants into the pilot required that individuals move through a series of stages, from gaining awareness of the pilot (through one or more of the communications activities) to developing an interest and then ultimately to committing to participate. The recruitment effort moved people through those stages incrementally and converted them from “interested bystanders” in a large pool of potential participants to 2,000 enrolled drivers.

Active participant recruitment for the test-driving phase began in summer 2017. Individuals were invited to join the project interest list and share basic contact information, such as first name, last name, email, and zip code in addition to indicating if they were interested in participating in the test-driving phase. The pilot project team reached out to those who were interested in

participating in the pilot project and sent a screening questionnaire requesting more demographic information. This was done to ensure the ultimate participant pool was representative of Washington’s demographics. Screening continued into fall 2017, followed by the participant enrollment phase.

During this time, the project help desk information line was launched to supplement the project email inbox and guide participants through the recruitment process via phone.

Participant enrollment

Beginning in mid-November 2017, qualified drivers on the project interest list who completed the screening questionnaire were sent invitations to participate in the pilot project. The outreach team continued responding to emails and phone calls to assist interested individuals with enrollment through the beginning of 2018.

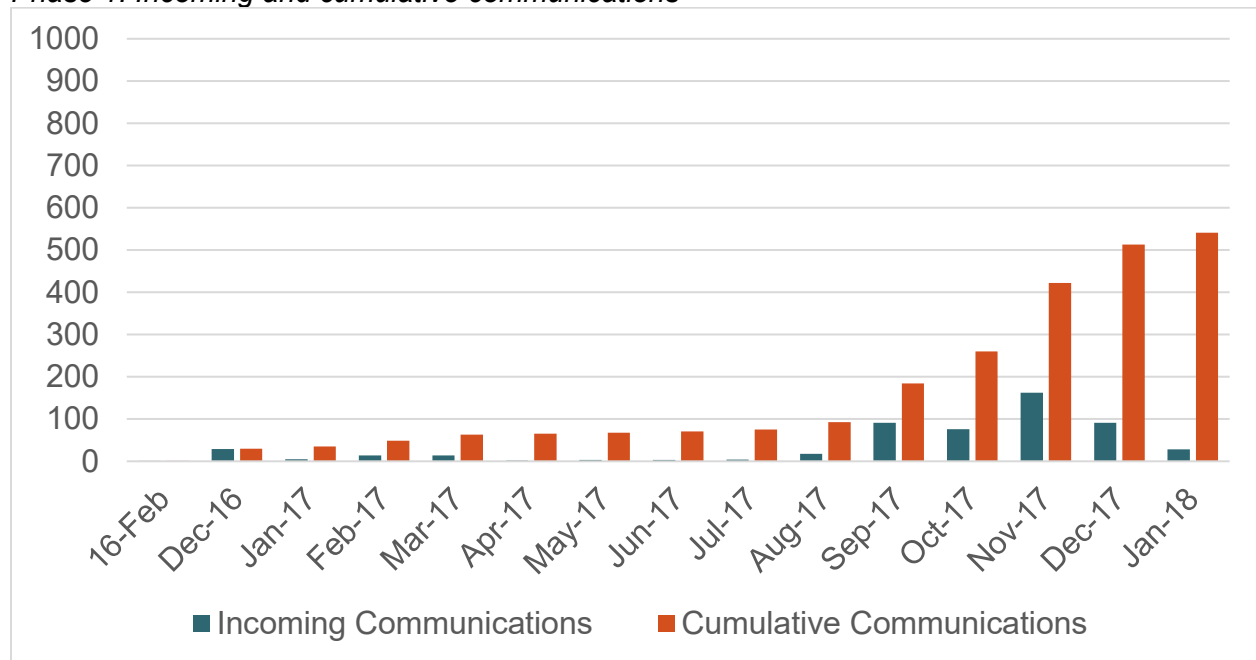
In February 2018, the test-driving phase began with over 2,000 participants enrolled. In August 2018, a second open-enrollment phase was offered to individuals who were still interested in participating. An additional 227 drivers were enrolled at this time.

Communication trends

The first email sent to the Washington State Transportation Commission (WSTC) regarding the pilot project was received in February 2016. The next influx of emails regarding the pilot project were received when the official project email address and the project interest list was launched in December 2016. From that point on, incoming communications to the project inbox or to the WSTC became more consistent.

The chart below shows incoming communications received each month and total cumulative communications received prior to the launch of the test-driving phase of the pilot project in February 2018. By the end of January 2018, the project team had received 541 communications via email or phone.

Phase 1: Incoming and cumulative communications



Communication topics

The table below shows the frequency at which several topics appeared throughout Phase 1 of the pilot project. The most frequent topic categories are defined in the next section.

Phase 1: Frequency of communication topics

Topic	Total
Enrollment inquiries	268
Policy, implementation	188
Other	75
General RUC inquiry	57
Vehicle weight	52
Out of state drivers	48
Driving out of state	29
Vehicle eligibility questions	28
Flaw	22
Privacy concerns	18
Invoice	10
Mileage reporting method	8
Surveys or incentives	3
DriveSync transfer	0
Emovis transfer	0
Service provider inquiry	0

Less

More



Table colors increase in intensity from yellow to red based on the frequency of occurrence.

Note that communications often reference more than one topic. As a result, the total frequency of all communication topics may not be equal to the total number of communications received for this period. During Phase 1 of the pilot project, limited service provider information was available for participants, which resulted in zero communications received for each of the service provider communication categories.

Summary of most frequent topics: Phase 1 (February 2016 to January 2018)

Below is a summary of most frequent topics discussed during Phase 1 of the pilot project with representative examples of the comments or questions received followed by a typical response from the help desk staff. The top six categories are discussed in the following section.

Enrollment inquiries

Enrollment inquiries were the most frequently received incoming communications during Phase 1 of the pilot project. The “enrollment inquiries” topic category captured all general enrollment questions or comments, such as requesting access to the participant demographic survey, inquiring about enrollment status, and participant stories that were shared with the pilot project team. Responses to these communications followed a generic template – such as a simple “thank you” or sharing a link that was lost in a previous email – therefore, a summary of these communications is not included.

Policy, implementation

Policy-related communications included comments regarding taxation policies (e.g., too many taxes or the current taxes being too high) and a road usage charge’s impact on equity and fairness. Implementation-related communications included questions on the logistics of switching to a road usage charge and how it would be enforced in a future policy.

Some of the more frequent policy and implementation comments or questions are listed below.

Excerpts for policy

- “We already have the second highest gas tax in the country. That should be enough.”
- “It would be an unfair punishment to me and others like me who have to travel.”
- “You are punishing families that cannot live close to Seattle or their work.”

Takeaways for policy

The goal of the project team’s help desk responses was to clarify how a road usage charge could be one way of addressing inequity with the gas tax. While the existing gas tax has some benefits, such as being a straightforward method of collecting revenues for roads and bridges, a road usage charge may end up being more equitable for drivers of all vehicle types.

Sample response

One of the key aims of testing a road usage charge would be to see if it can alleviate the inequity of the current gas tax system, which is unfair to those who cannot afford highly fuel-efficient vehicles. Currently, drivers of lower MPG cars carry a greater burden in paying for the costs of repairing our roads, since drivers of higher MPG cars purchase less gas and thus pay less in gas tax. A road usage charge would ensure that drivers pay only for the miles they drive, regardless of what kind of vehicle they drive.

Washington has raised its gas tax several times in the past decade to fund higher demand for road projects, yet gas tax revenues are still expected to decline as vehicles become more fuel-efficient. If the state were to continue raising the gas tax to meet funding needs, the gas tax would have to increase by 1.5 cents every year to keep revenues at today’s level, without addressing inflation or the needs of a growing population.

This would raise the gas tax to 73.3 cents per gallon by 2035 and 89.4 cents per gallon by 2043, with a smaller and smaller share of the population bearing the burden of the costs (WSTC 2016 Road Usage Charge Assessment – Phase 4 Final Report, 23-33). Compared to the gas tax, a road usage charge

could provide a more stable source of transportation funding and better support infrastructure development in our state.

Excerpts for implementation

- “How would it work when I fill up my tank? Will I have a card to show at the gas station that shows I am exempt, so I won't be paying twice?”
- “What is the amount of taxes that will be removed at the pump given this particular proposal?”
- “I understand the desire to try to make taxes easier or more straightforward, but I believe charging per mile isn't a good solution.”

Takeaways for implementation

A road usage charge pilot project is being implemented to help address a wide range of logistical questions like those mentioned above. The pilot project serves as an opportunity to test whether a road usage charge is a good fit for Washington. Results from the pilot project will help inform a future potential road usage charge policy and the WSTC and state legislature will work together to further refine the details of a RUC.

Sample response

We are currently testing a road usage charge as a potential replacement for the gas tax, not as an additional tax. If the road usage charge is to advance as a real program, it will need to be done via a gradual transition away from the gas tax. In Washington, our state fuel tax is 49.4 cents/gallon for either gasoline or diesel fuel. This would not mean that Washington drivers would be taxed twice; the transition would include a way for drivers to reconcile what they paid at the pump with what is owed to the driver or state. This transition would also allow the state time to explore how to incorporate out-of-state drivers into a future policy.

The current fuel tax system is a low-cost and efficient method of collecting taxes (less than 1 percent overhead). A road usage charge would be comparatively more expensive to collect. We wanted to learn more about this so we conducted a study and found that costs would decline as the number of vehicles paying road usage charges increases. At a large scale, the cost of collecting road usage charges can fall below 5 percent of revenues and could provide sustained funding for transportation in future years when fuel tax revenues decline (WSTC 2016 Road Usage Charge Assessment – Phase 4 Final Report, 18). This cost of collection is comparable to other utilities such as water and electricity, which also meter customers for their usage as the basis for payments.

Other

The project help desk team created a category called “other” to serve as a comprehensive catch-all for all communications that did not fit into the other communication categories. Generally, these communications included media requests, project list subscriptions, alternative methods for funding, and comments on the existing transportation budget. The individual topics were repeated infrequently, thus standardized response language was not developed for each one.

Out of state drivers

The project help desk received many comments and questions regarding how drivers from outside of Washington would use a road usage charge while driving on Washington roads.

Excerpts

- “If you get rid of the gas tax at the pump, how will you collect tax from visitors to our state?”

- “How does this effect those who live in, say, Idaho in areas like Post Falls, and work or go to school in Washington? My wife and I live in Post Falls. She works in Liberty Lake and I attend Spokane Falls, a community college.”
- “How about people coming to visit the state? Will they get lower gas prices and use the roadways for free?”

Takeaways for out of state drivers

The pilot project did not include a way to reconcile payments from out of state drivers who drive in Washington. However, the project team is exploring options for interoperability with other states that are considering road usage charges. Exact details will need to be refined before a potential RUC is implemented in Washington.

Sample response

We’re currently testing a road usage charge as one potential option for Washington state. For our pilot project, we’ve recruited drivers who live near the borders in Idaho, Oregon, and British Columbia, as well as Washington drivers who live near the other sides of those borders, to help understand the needs of those who frequently travel between states.

If the road usage charge is to advance as a real program, it will probably be done via a gradual transition away from the gas tax. This would not mean that Washington drivers would be taxed twice; the transition would include a way for drivers to reconcile what they paid at the pump with what is owed to the driver or state. This transition would also allow the state time to explore how to incorporate out-of-state drivers into a future policy.

We are also exploring options for interoperability between a potential Washington road usage charge and other states that are considering pay-per-mile systems. For instance, Oregon and California both have pilot programs as well for road usage charges, and we’re looking at ways that potential future road usage charge systems could interact.

General RUC inquiry

Many communications received by the project help desk did not fall into a specific communication category. This communication category was frequently discussed in both Phase 1 and Phase 2 of the pilot project. Typical responses to some of the most frequently received general RUC inquiries can be found in *Summary of most frequent topics: Phase 2 (February 2018 to January 2019)*.

Vehicle weight

Many members of the public provided comments on vehicle weights and their level of impact on roads.

Excerpts

- “I think heavier vehicles that cause more damage to the roads should be charged more, as opposed to a light-weight hybrid or electric car. I’m not sure a flat fee is the right way to go.”
- “In keeping with the interest of charging based on our individual impact on the roads, I would expect the mileage fee to increase with gross vehicle weight, for instance. What consideration has been given to this issue?”
- “I firmly believe that rate per mile must be based on how much the vehicle weighs. In this business, weight relates directly to the wear and tear on the driving surface.”

Takeaways for vehicle weight

The existing gas tax does not differentiate between vehicle weight. A future RUC policy offers more flexibility and could charge different rates depending on vehicle weight and type.

Sample response

The difference in impact on roadways between passenger vehicles under 10,000 pounds is miniscule at best. The real damage is done by vehicles over 10,000 pounds and those are typically the freight and commercial vehicles. Heavy vehicles passing through Washington, such as trucks, already report and pay for road usage through fuel taxes that are reconciled through the International Fuel Tax Agreement, a 58-jurisdiction compact among the 48 lower states and 10 Canadian provinces. Consequently, this pilot will focus on light, four-wheeled vehicles only.

If legislators decide to explore how a road usage charge could be implemented, the road usage charge also offers more potential flexibility than the gas tax. For example, it is possible that a future road usage charge policy could offer different rates depending weight, vehicle type, or other variables. This kind of flexibility is not present under today's gas tax structure. If the legislature decides to move forward with a road usage charge system after the pilot test, they will have to evaluate their options for setting rates.

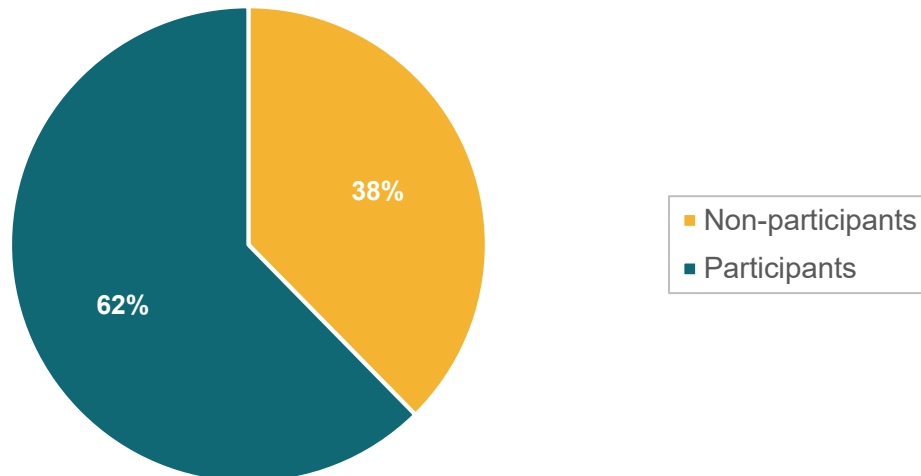
Phase 2: Live pilot test driving (February 2018 to January 2019)

Test-driving for the pilot project began in February 2018 and ended in January 2019. Approximately 2,000 drivers participated in the year-long pilot project. During this time, participants reported their mileage and provided feedback through focus groups, surveys and the project help desk. Collectively, the 2,000 test drivers reported over 15 million miles driven and shared feedback through over 1,300 written comments and phone calls.

Help desk by the numbers

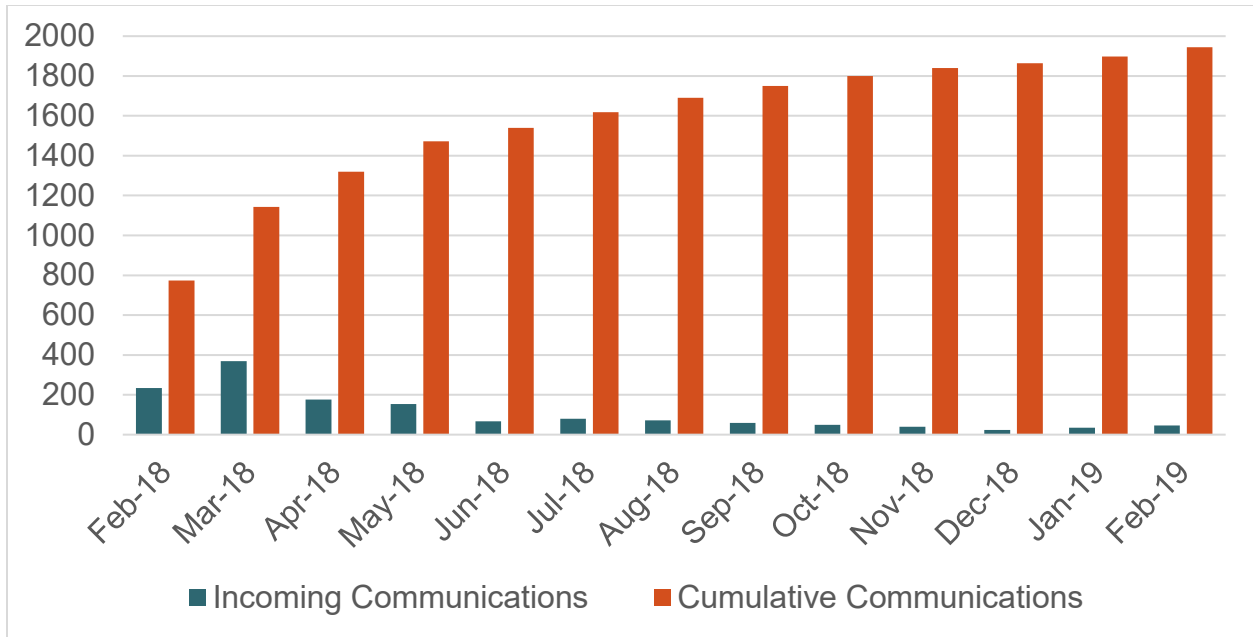
The help desk heard from a total of 741 unique individuals during the test-driving phase of the pilot project. Of the 741 individuals who contacted the help desk during Phase 2, 462 were pilot participants and 279 were members of the general public. Said another way, roughly 62% percent of all users who contacted the help desk during Phase 2 were participants in the pilot project.

Phase 2: Incoming communications by user type



On average, the project help desk received 113 communications monthly via email or phone during the test-driving phase of the pilot project. The number of communications received peaked in March 2018, with 369 communications recorded in the project database.

Phase 2: Incoming and cumulative communications



Communication topics

The table below shows the frequency at which several topics appeared throughout Phase 2 of the pilot project. The most frequent topic categories are defined in the next section.

Phase 2: Frequency of communication topics

Topic	Total
Mileage reporting method	220
DriveSync transfer	190
General RUC inquiry	183
Enrollment inquiries	153
Survey/Incentives	108
Other	103
Invoice	76
Policy/implementation	62
Service provider general inquiry (not transferred)	58
Driving out of state	50
Vehicle weight	47
Vehicle eligibility questions	35
Privacy concerns	34
Flaw	27
Out of state drivers	23
Emovis transfer	21



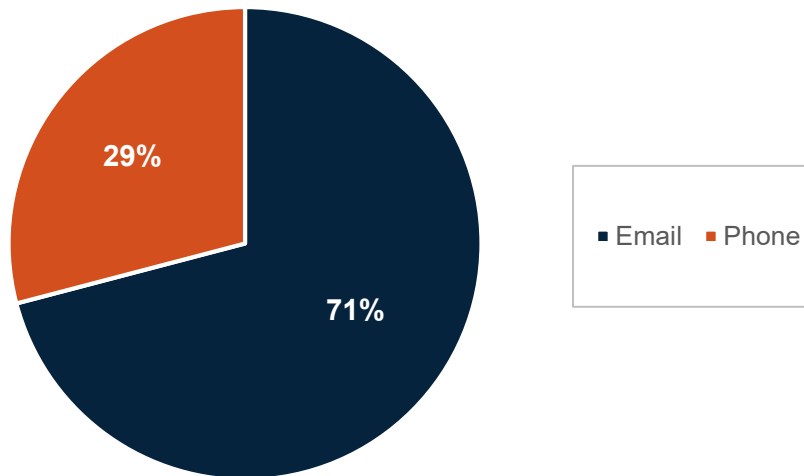
Table colors increase in intensity from yellow to red based on the frequency of occurrence.

Note that communications often reference more than one topic. As a result, the total frequency of all communication topics may not be equal to the total number of communications received for this period. During Phase 1 of the pilot project, limited service provider information was available for participants, which resulted in zero communications received for each of the service provider communication categories.

Communication trends by type

The project team could be reached through emails or phone calls to the help desk. 71% of communications received were emails to the project inbox (929 emails); the remaining 29% of communications were phone calls to the help desk (381 phone calls).

Communications received from all users by communication type

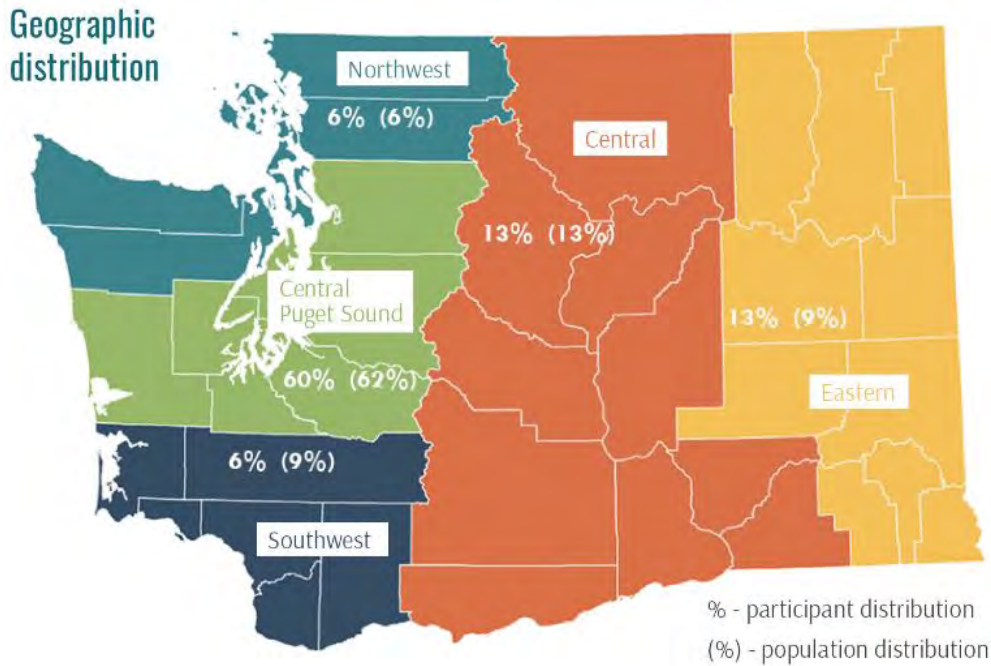


Communication trends by region

A point of interest for the pilot project is to determine if the number and type of communications received matched the regional distribution of pilot participants. For example, would 60% to 62% of all communications regarding each of the communication topics come from the Puget Sound region if 60% to 62% of the state’s population and the pilot project participants resided in the Puget Sound region? With simple regional location data available for enrolled participants, it is possible to complete some basic analysis on what topics were elevated by drivers in each region and whether there are any regional differences in the types of topics people care to use the help desk for.

The map below shows the geographic distribution of Washington’s population and the participant distribution for the pilot project.

Phase 2: Participant and population distribution for Washington



The following table shows the distribution of communications received from each of the geographic regions.

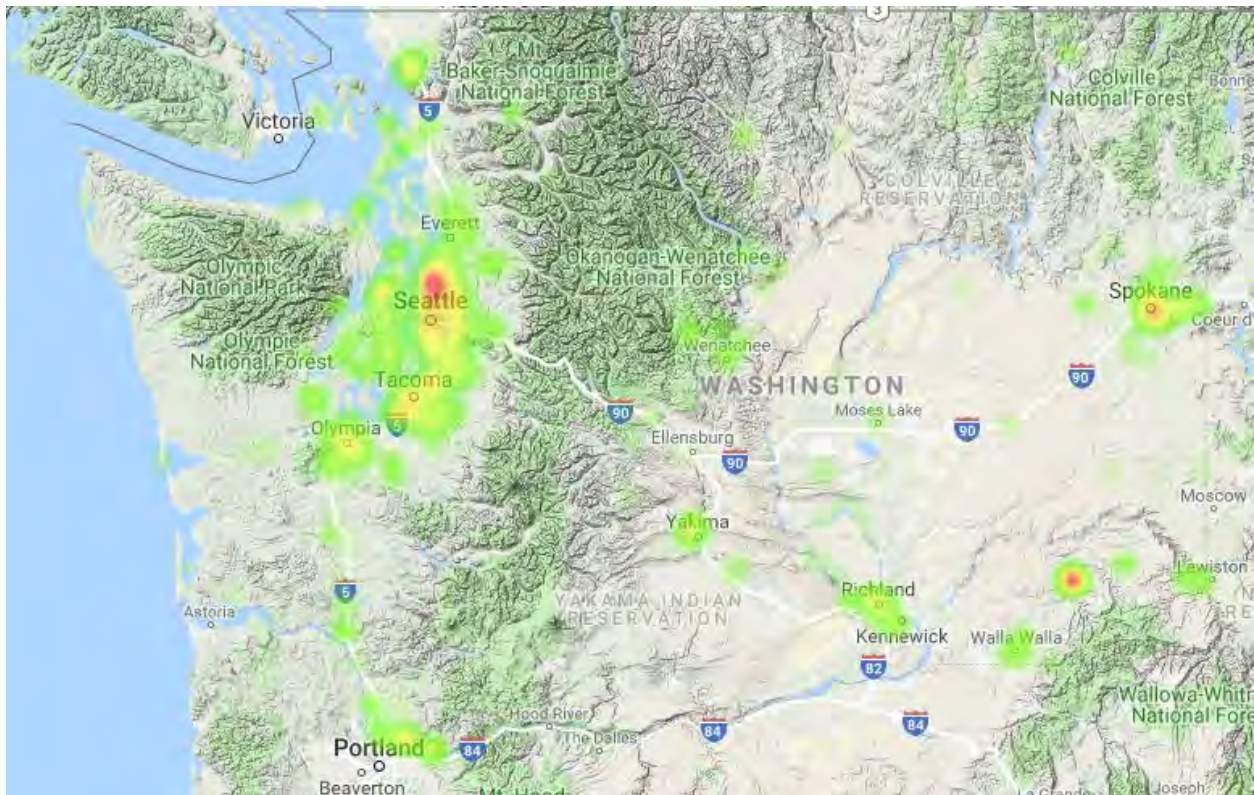
Phase 2: Population and participant distribution compared to cumulative communication distribution

Region	Population distribution	Participant distribution	Percentage of communications received
Central	13%	13%	11.2%
East	9%	13%	17.2%
Northwest	6%	6%	5.2%
Puget Sound	62%	60%	49.4%
Southwest	9%	6%	5.5%
Unknown	N/A	N/A	12.0%

The table shows that most of the communications received were from the Puget Sound region and the least number of communications received were from the Northwest and Southwest regions. The remainder of the data generally aligns with the participant pool and population distribution percentages in each region, indicating that the project team did not hear from a region more than anticipated.

Approximately 12% of communications received did not have an associated location. This could be due to several factors, such as incomplete profile data from the interest list or new members of the public contacting the project team after regional location data was no longer requested.

The image below is a heat map of communications received. Please note that location information was not available for all of the communications received, thus the map below is not comprehensive of all communications.



Communication topic trends by region - raw numbers

The following table indicates the frequency at which various topics were discussed within each region (if provided) in raw numbers. Table colors increase in intensity from yellow to red based on the frequency of occurrence within each region. Topics are in descending order based on total frequency (excluding “Other”).

Phase 2: Communication topic trends by region - raw numbers

Topic	Total frequency	Central	East	Northwest	Puget Sound	Southwest	Unknown
Mileage reporting method	225	19	58	9	113	7	19
DriveSync transfer	208	20	22	16	115	16	19
General RUC inquiry	179	21	36	4	60	7	51
Enrollment inquiries	158	10	22	13	96	8	9
Surveys or incentives	109	9	16	7	59	14	4
Invoice	84	14	31	0	24	7	8
Service provider inquiry	64	3	9	8	33	5	6
Policy or implementation	55	2	16	3	11	4	19
Vehicle weight	53	8	8	4	10	0	23
Driving out of state	49	6	11	0	14	2	16
Vehicle eligibility questions	36	4	10	4	9	3	6
Privacy concerns	33	1	2	0	16	0	14
Flaw	29	2	3	1	21	0	2
Emovis transfer	21	3	4	0	13	0	1
Out of state drivers	21	2	3	0	2	0	14
Other	102	17	18	4	46	4	13



Less

More

In raw numbers, the top five communication topics by region during Phase 2 were:

Central

- General RUC inquiry
- DriveSync transfer
- Mileage reporting methods
- Other
- Invoice

East

- Mileage reporting method
- General RUC inquiry
- Invoice
- Enrollment inquiries
- Other

Northwest

- DriveSync transfer
- Enrollment inquiries
- Mileage reporting method
- Service provider inquiry
- Surveys/incentives

Puget Sound

- DriveSync transfer
- Mileage reporting method
- Enrollment inquiries
- General RUC inquiry
- Surveys/incentives

Southwest

- DriveSync transfer
- Surveys/incentives
- Enrollment inquiries
- Mileage reporting method
- General RUC inquiry
- Invoice

Unknown location

- General RUC inquiry
- Vehicle weight
- DriveSync transfer
- Mileage reporting method
- Policy or implementation
- Driving out of state

The top five communication topics received from all regions (including communications not attached to a specific region) were:

- Mileage reporting method
- DriveSync transfer
- General RUC inquiry
- Enrollment inquiries
- Surveys/incentives

A summary of these topics can be found at the end of this report.

Communication topic trends by region - percentages

The following table shows the percentage of total communications received by drivers from each region. For example, 9.6% of DriveSync transfer communications came from drivers in the Central region because 20 out of the 208 related communications were associated with that region.

Additionally, the table shows a distribution analysis of the communications based on participant distribution and anticipated communications in percent. The anticipated percentage of communications received by each region is defined as a percentage range of one quartile below and above the actual participant distribution. For example, in the Central region, one quartile below the actual participant distribution of 13% is 9.75%. One quartile above that is 16.25%. The project team would expect that the frequency of communications received would fall into that range unless there were topics that were particularly interesting to a specific region.

Percentage values that are shown in green are within one-quartile of the participant distribution percentage. Values in red are beyond the upper quartile, indicating that the corresponding topic had a higher proportion of communications received. Percentage values in black are less than the specified quartile ranges.

Phase 2: Distribution of communication topics in relation to participant distribution in percent

	Central	East	Northwest	Puget Sound	Southwest
Participant distribution	13%	13%	6%	60%	6%
Anticipated percentage of communications	9.75% - 16.25%	9.75% - 16.25%	4.5% - 7.5%	45% - 75%	4.5% - 7.5%
Topic					
DriveSync transfer	9.6%	10.6%	7.7%	55.3%	7.7%
Driving out of state	12.2%	22.4%	0.0%	28.6%	4.1%
Emovis transfer	14.3%	19.0%	0.0%	61.9%	0.0%
Enrollment inquiries	6.3%	13.9%	8.2%	60.8%	5.1%
Flaw	6.9%	10.3%	3.4%	72.4%	0.0%
General RUC inquiry	11.7%	20.1%	2.2%	33.5%	3.9%
Invoice	16.7%	36.9%	0.0%	28.6%	8.3%
Mileage reporting method	8.4%	25.8%	4.0%	50.2%	3.1%
Out of state drivers	9.5%	14.3%	0.0%	9.5%	0.0%
Policy or implementation	3.6%	29.1%	5.5%	20.0%	7.3%
Privacy concerns	3.0%	6.1%	0.0%	48.5%	0.0%

Service provider inquiry	4.7%	14.1%	12.5%	51.6%	7.8%
Surveys or incentives	8.3%	14.7%	6.4%	54.1%	12.8%
Vehicle eligibility questions	11.1%	27.8%	11.1%	25.0%	8.3%
Vehicle weight	15.1%	15.1%	7.5%	18.9%	0.0%
Other	16.7%	17.6%	3.9%	45.1%	3.9%

*The anticipated percentage of communications received by the region is a range of one quartile above and below the participant distribution.

According to the data above, the help desk received communications from the Puget Sound region on each of the topics at or below the anticipated frequencies based on the participant and population distribution. The percentage of communications received per topic did not exceed one-quartile of the anticipated percentage, which is approximately 75% of all total communications.

On the contrary, there were several communication topics in each of the other regions that exceeded the anticipated frequency. When accounting for participant distribution, the following communication categories emerged as having piqued a particular interest in each of the regions.

Central

- Invoice

East

- Invoice
- Policy/implementation
- Vehicle eligibility questions
- Mileage reporting method
- Driving out of state
- General RUC inquiry
- Emovis transfer

Northwest

- Service provider inquiry
- Vehicle eligibility questions
- Enrollment inquiries
- DriveSync transfer
- Vehicle weight

Southwest

- Surveys/incentives
- Invoice
- Vehicle eligibility questions
- Service provider inquiry
- DriveSync transfer

Findings

While many of these topics are general, there are some minor conclusions that can be drawn from this list of topics:

- For the East region, it is worth noting that both “policy/implementation” and “general RUC inquiry” were received at higher rates than anticipated. This could indicate that drivers residing in Eastern Washington may have more questions and comments on the policy and logistical aspects of a RUC or may need more targeted outreach to help explain the purpose of a RUC.
- Vehicle eligibility questions were also received at a higher than anticipated rate in the East, Northwest, and Southwest regions. If a RUC policy were to be implemented in Washington, the vehicle requirements will need to be clearer for drivers in these parts of the state.

Communication trends by mileage reporting method (MRM) - raw numbers

The following table indicates the correlation between the topics brought up by drivers (total) and the mileage reporting method used during the pilot project (if applicable). Table and map colors increase in intensity from yellow to red based on the frequency of occurrence.

Phase 2: Communication trends by mileage reporting method (MRM) - raw numbers

Topic	Mileage permit	Plug-in device	Plug-in device with GPS	Odometer reading	Smartphone app
DriveSync transfer	3	19	52	48	33
Driving out of state	0	3	9	10	3
Emovis transfer	0	0	1	16	0
Enrollment inquiries	4	15	45	40	9
Flaw	4	4	3	10	4
General RUC inquiry	5	13	32	40	7
Invoice	0	3	28	39	0
Mileage reporting method	1	28	47	76	15
Out of state drivers	0	0	3	3	0
Policy or implementation	1	0	10	14	2
Privacy concerns	1	2	3	4	2
Service provider inquiry	2	4	17	25	0
Surveys or incentives	1	23	37	32	10
Vehicle eligibility questions	0	2	12	8	1
Vehicle weight	0	9	9	1	0
Other	0	9	8	4	3

*Please note communications often reference more than one topic. As a result, totaling columns or rows will produce results that exceed the total number of communications received.



The top five communication topics by mileage reporting method during Phase 2 were:

- | | | |
|---|---|--|
| <p>Mileage permit</p> <ul style="list-style-type: none"> • General RUC inquiry • Enrollment inquiries • Flaw • DriveSync transfer • Service provider inquiry | <p>Plug-in device</p> <ul style="list-style-type: none"> • Mileage reporting method • Surveys or incentives • DriveSync transfer • Enrollment inquiries • General RUC inquiry | <p>Plug-in device (with GPS)</p> <ul style="list-style-type: none"> • DriveSync transfer • Mileage reporting method • Enrollment inquiries • General RUC inquiry • Invoice |
| <p>Odometer reading</p> <ul style="list-style-type: none"> • Mileage reporting method • DriveSync transfer • General RUC inquiry • Enrollment inquiries • Invoice | <p>Smartphone app</p> <ul style="list-style-type: none"> • DriveSync transfer • Mileage reporting method • Surveys or incentives • Enrollment inquiries • General RUC inquiry • Flaw | |

Communication topic trends by mileage reporting method (percentages)

All factors being equal, the pilot project team could assume that the percentage of communications received from each of the MRMs would be similar to the distribution of pilot project participants using the corresponding MRM.

For example, we could expect that one percent of all communications regarding each of the topics would come from participants using the mileage permit MRM since one percent of the pilot’s participants were enrolled using that MRM. The table below shows that the percentages are not exactly equal; some MRM users contacted the help desk at different rates than anticipated.

Phase 2: Distribution of participant MRM choice compared to cumulative communication distribution

MRM	Participant distribution	MRM source of communications received (in percent)
Mileage permit	1.0%	2.3%
Plug-in device	21.0%	14.3%
Plug-in device with GPS	34.0%	33.7%
Odometer reading	29.0%	39.4%
Smartphone app	15.0%	9.5%
N/A	N/A	0.7%

Communication trends by mileage reporting method (MRM) – percentages

The following table shows the percentage of communications received by topic correlated to the mileage reporting method chosen by the driver. Percentage values that are shown in green are within one-quartile of the participant distribution percentage. Values in red are beyond the upper quartile, indicating that the corresponding topic had a higher than anticipated percentage of communications received. Percentage values in black are less than the specified quartile ranges.

Phase 2: Distribution of communication topics in relation to MRM distribution in percent

	Mileage permit	Plug-in device	Plug-in device with GPS	Odometer reading	Smartphone app	N/A
Participant distribution	1%	21%	34%	29%	15%	
Anticipated percentage*	0.75% - 1.25%	15.75% - 26.25%	25.5% - 42.5%	21.75% - 36.25%	11.25% - 18.75%	
Topic						
DriveSync transfer	1.9%	12.3%	33.5%	31.0%	21.3%	0.0%
Driving out of state	0.0%	12.0%	36.0%	40.0%	12.0%	0.0%
Emovis transfer	0.0%	0.0%	5.9%	94.1%	0.0%	0.0%
Enrollment errors	3.5%	13.3%	39.8%	35.4%	8.0%	0.0%
Flaw	16.0%	16.0%	12.0%	40.0%	16.0%	0.0%
General RUC inquiry	5.1%	13.1%	32.3%	40.4%	7.1%	2.0%
Invoice	0.0%	4.3%	40.0%	55.7%	0.0%	0.0%
Mileage reporting method	0.6%	16.8%	28.1%	45.5%	9.0%	0.0%
Out of state drivers	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%
Policy or implementation	3.7%	0.0%	37.0%	51.9%	7.4%	0.0%
Privacy concerns	8.3%	16.7%	25.0%	33.3%	16.7%	0.0%
Service provider inquiry	4.2%	8.3%	35.4%	52.1%	0.0%	0.0%
Surveys or incentives	1.0%	22.3%	35.9%	31.1%	9.7%	0.0%
Vehicle eligibility questions	0.0%	8.3%	50.0%	33.3%	4.2%	4.2%
Vehicle weight	0.0%	39.1%	39.1%	4.3%	0.0%	17.4%
Other	0.0%	37.5%	33.3%	16.7%	12.5%	0.0%

*The anticipated percentage of communications received by MRM is a range of one-quartile above and below the participant distribution.

According to the data above, there were several communication topics from each of the MRM users that exceeded the anticipated frequency. When accounting for participant distribution, the following communication categories emerged as having piqued a particular interest in each of the MRM users.

Mileage permit

- Flaw
- Privacy concerns
- General RUC inquiry
- Service provider inquiry
- Policy or implementation
- Enrollment errors
- DriveSync transfer

Plug-in device

- Vehicle weight

Plug-in device with GPS

- Vehicle eligibility questions
- Out of state drivers

Odometer reading

- Emovis transfer
- Invoice
- Service provider inquiry
- Policy or implementation
- Out of state drivers
- Mileage reporting method
- General RUC inquiry
- Driving out of state
- Flaw

Smartphone app

- DriveSync transfer

Findings

Participants that used the odometer reading MRM had the highest number of topics in excess of the anticipated percentage. The table on page 21 (*Phase 2: Distribution of participant MRM choice compared to cumulative communication distribution*) also indicates that 39% of communications were received from these users, even though they only accounted for 29% of total participants. These users were particularly engaged throughout the project. One figure of note is the percentage of odometer-reading MRM users who were transferred to Emovis, a service provider. Only a small percentage of participants were enrolled with Emovis and many of them used the odometer reading MRM, which accounts for the high percentage shown in the table.

Participants using the plug-in device with GPS MRM also had many comments and questions on vehicle eligibility. Fifty percent of communications involving vehicle eligibility were from these users. The plug-in device with GPS was only compatible with vehicles with OBD-II ports. Many older vehicles did not qualify. Additionally, many participants contacted the help desk asking for assistance with installing the plug-in device at the beginning of the test-driving phase which resulted in a service provider transfer.

Summary of most frequent topics: Phase 2 (February 2018 to January 2019)

Below is a summary of most frequent topics discussed during Phase 2 of the pilot project with key examples provided of the comments or questions received and a response from the help desk staff.

Mileage reporting method

This communication category topic was used to identify communications involving any of the mileage reporting methods. This included general inquiries on each of the methods during recruitment and enrollment, in addition to any communications requesting more information or assistance with each method during the test-driving phase. If participants needed assistance with their MRM, they would be transferred to their service provider.

Excerpts regarding mileage reporting methods

- “I am undecided as to which Mileage Reporting Method to use.”
- “I’m having issues with reporting my mileage.”

Takeaways for mileage reporting methods

The help desk team shared information about each of the MRMs. Information was available on the project website and during the enrollment process for the test-driving phase. The help desk team also assisted potential participants with selecting an MRM based on their individual needs.

Sample response

Thank you for your patience as we’ve continued to refine the mileage reporting methods that we’re offering for the WA RUC Pilot Project. We have several different mileage reporting methods for you to choose from.

- Mileage permit: Pre-select miles based on how much you expect to drive in 3 months, and report mileage through your smartphone by submitting a photo of your odometer
- Odometer readings: Submit a photo of your odometer monthly or quarterly using your smartphone
- Plug-in device with GPS: Plug-in device automatically reports mileage and records miles driven out of state separately – works with all vehicles 1996 or newer
- Plug-in device without GPS: Plug-in device automatically reports mileage but does not record whether miles were driven in-state or out of state – works on all vehicles 1996 or newer
- MileMapper™ Smartphone App:

If you would like to discuss the different methods, please feel free to give our help desk a call at 1-833-927-4782. Our help desk is staffed Monday – Friday, 8 a.m. – 5 p.m.

Once you’ve selected your mileage reporting method and your service provider, you’ll be asked to log in again with your email address and the password you set up in step 1. If you’ve forgotten the password to the account you set up, you will have the opportunity to change it at that time. After that, you’ll be able to complete your registration by providing your vehicle information to your service provider.

For communications regarding issues with reporting mileage, see the next section.

DriveSync transfer

This communication category served as a comprehensive code for emails and phone calls that were transferred to DriveSync, one of the service providers for the pilot project. Typical comments and questions received included technical difficulties with reporting mileage, issues with accessing user accounts, or other technical issues that the project help desk team were unable to assist with. A generic response was sent to participants if their email was forwarded to DriveSync.

General RUC inquiries

Many communications received by the project help desk did not fall into a specific communication category. Below are excerpts and typical responses to some of the most frequently received general RUC inquiries.

Excerpts regarding driving on non-public roads

- “I go to Central Washington on most weekends. Some of my driving is on private road. How will you know to NOT charge someone for the mileage that is driven on private roads?”
- “Will federally-funded roads (such as roads under the control of the US Forest Service, or roads such as US-12 or US-395) be “chargeable” if one is using a GPS enabled option?”

Takeaways for driving on non-public roads

A RUC has the potential to be more flexible than the existing gas tax. Currently, there is no way to differentiate or reconcile miles driven or gas used on private or federally funded roads. A RUC can offer ways to differentiate or reconcile those miles to ensure that drivers are only charged for driving on roads that are state funded.

Sample response

There are several different types of roads in our state. There are state-owned roads, private roads, and federal roads. During this pilot project, we are testing the ability for drivers who choose a GPS-enabled reporting system to automatically deduct miles driven on private roads because those roads are maintained using private dollars.

The pilot is not testing the same function for federally managed roads, but any mechanism used for exempting or refunding a road usage charge on private roads could potentially be applied to federal roads as well. This kind of flexibility is not available with the current gas tax system. Under current law, drivers are not eligible for refunds of or exemptions from taxes paid on fuel consumed on federally owned roads such as USFS roads, or for fuel consumed on private roads or private lands in vehicles registered for highway use.

We hope that we hear from a diverse group of people during the pilot, including those who regularly travel on private or federal roads, to help shape any future policy choices like refunds and exemptions in a potential full implementation.

Excerpts regarding administrative and overhead costs

- “The 38 administrative functions required of RUC will send the state budget over the moon and negate revenue supposedly derived from RUC. Enforcement alone sounds very expensive and rather like some police state behavior.”
- “The implementation of any new idea will burden additional cost to (i) the elderly driver (ii) WDOT (hiring, training, maintaining, tracking/identifying/collecting from evaders, securing the system

from data breaches, not to mention new resource pension, healthcare), and cost to businesses that sell gas (loss of revenue, their cost of changing system, cost to clean up property.)”

Takeaways for administrative and overhead costs

The project team understands the concern for administrative overhead costs associated with implementing a RUC. A study was conducted by the WSTC in 2016 that found that the overhead costs with a RUC would be comparable to other metered costs, such as utilities.

Sample response

The current fuel tax system is a low-cost method of collecting taxes (less than 1 percent overhead), and that a road usage charge would be relatively more expensive to collect. We wanted to learn more about this, too, so we conducted a study and found that costs would decline as the number of vehicles paying road usage charges increases. This study also projects that by spending more in administrative costs we will receive higher revenues overall. At a large scale, the cost of collecting road usage charges may fall below 5 percent of revenues and could provide sustained funding for transportation in future years when fuel tax revenues decline (WSTC 2016 Road Usage Charge Assessment – Phase 4 Final Report, 18). This cost of collection is comparable to other utilities such as water and electricity, which also meter customers for their usage as the basis for payments.

Excerpts regarding fuel-efficient vehicles

- “Electric vehicle owners already pay an extra annual registration charge that’s supposed to equal the gas tax.”
- “The currently studied per-mile rate is a disincentive for the average WA vehicle owner to change to a more fuel-efficient vehicle, thus promoting the concept of consuming more non-renewable resources and adding to the already polluted air and general carbon footprint.”

Takeaways for fuel-efficient vehicle communications

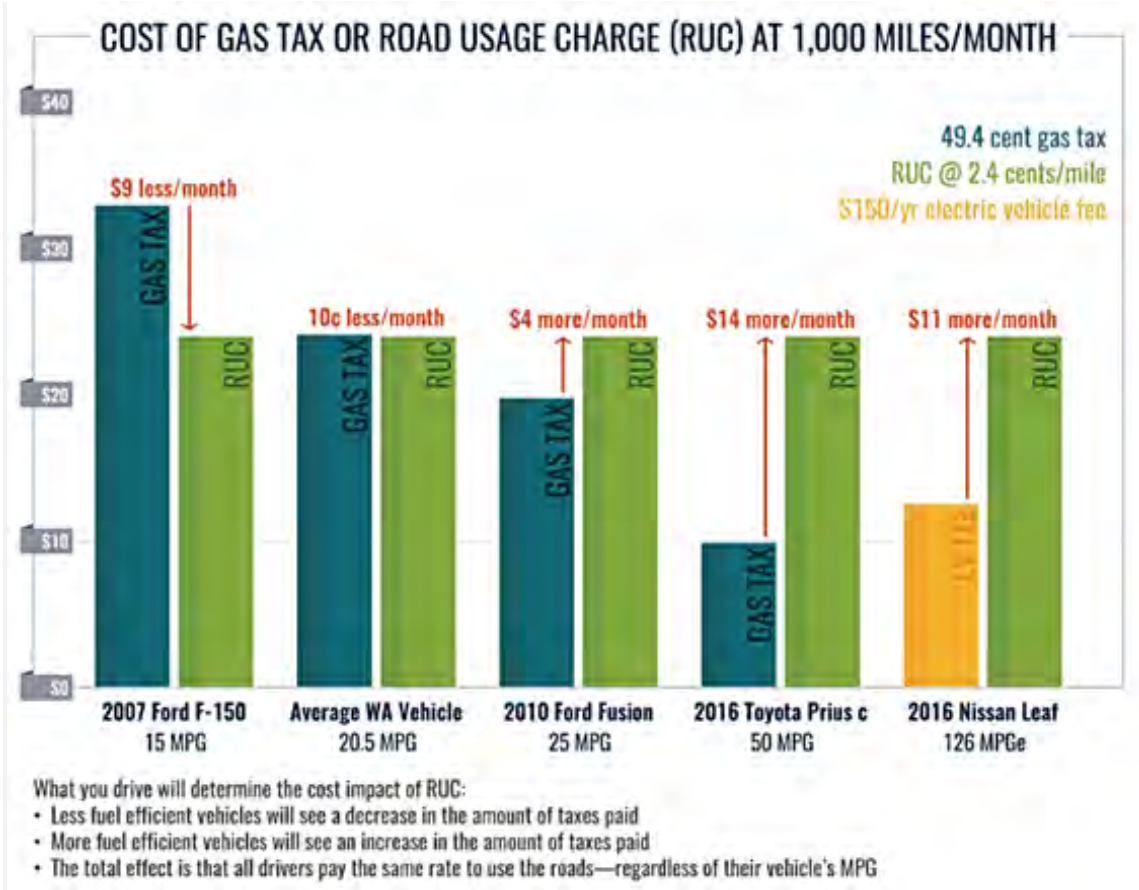
The pilot project is testing whether a RUC would be more equitable for drivers who do not drive fuel-efficient vehicles. Drivers with vehicles that are less fuel-efficient carry a higher burden on paying the gas tax, even though their impact to the roads is the same as electric vehicles. The WSTC Steering Committee will explore a RUC’s impact on electric vehicle adoption in their final report.

Sample response

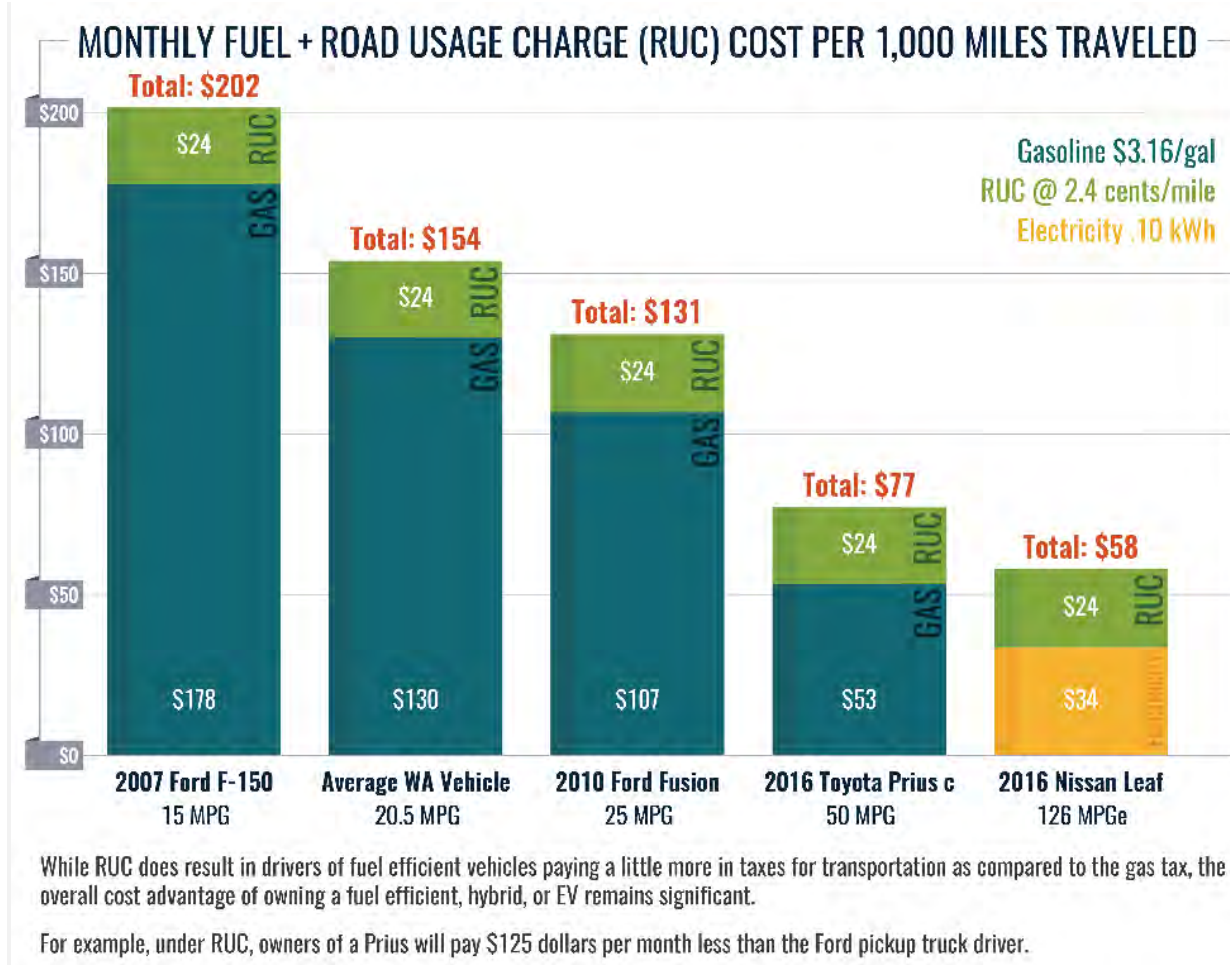
A key goal of exploring a road usage charge is to see if we can move towards a system where each driver will pay their fair share in using our public roads. Currently, drivers of lower MPG cars may carry a greater burden in paying for the costs of repairing our roads, since drivers of higher MPG cars purchase less gas, and thus pay less in gas tax. We are exploring whether a road usage charge could ensure that drivers pay only for the miles they drive, regardless of what kind of vehicle they drive.

As more fuel-efficient cars and electric vehicles drive our roads, the revenue acquired from the current gas tax decreases, which disproportionately places the upkeep of our state-maintained roads on drivers of gasoline-fueled vehicles. This potential road usage charge would be a replacement to the gas tax that aims to have all drivers pay their fair share in using our public roads.

Depending on the type of vehicle and how many miles you typically drive, some drivers may see a slight increase in the amount they pay in taxes (like drivers of high MPG or electric vehicles), while many drivers would likely see a small decrease in taxes paid. See the graph below for examples of how much drivers would pay depending on their vehicle type.



The chart below shows the costs of a RUC compared to the cost of the gas tax by car type. Note that when the fuel costs are added to the tax cost, fuel efficient cars still pay less compared to lower MPG vehicles. This is because the RUC would simply replace the gas tax portion of one's costs – not the per-gallon price we pay for the fuel we purchase, which is a majority of our fuel costs.



Enrollment inquiries

Enrollment inquiries continued to be a popular communication topic after the launch of the test-driving phase. A majority of these communications came from pilot participants confirming the status of their enrollment. During the test-driving phase, participants asked for assistance with completing their enrollment and for clarification on next steps for participating. The responses varied depending on which step the participant was in the enrollment process. Next steps after enrollment also depended on the MRM that was selected.

A second round of enrollment was launched in August 2018. Many of the communications received were from members of the original interest list confirming their eligibility to participate and inviting them to enroll.

Surveys/incentives

A majority of these communications included participants requesting new links to pilot project surveys or asking about the status of the various incentive gift cards that were sent out during the pilot. Help desk staff responded by resending the survey links or coordinating with the gift card vendor to resend the gift card codes. Delays in gift cards being sent out or gift card codes ending up in email spam folders resulted in a high percentage of these communications.



A-5

WASHINGTON TRANSPORTATION
FUNDING PUBLIC OPINION ASSESSMENT

 **WA RUC**



Washington Transportation Funding Public Opinion Assessment

FINAL REPORT OF FINDINGS

**Prepared for Washington State Transportation Commission
Road Usage Charge Pilot Project**

December 2017

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1.0 INTRODUCTION & METHODOLOGY

DHM Research conducted a multi-phase research program to assess public perceptions of transportation funding and a potential road usage charge. An initial telephone survey assessed public perceptions of transportation funding, views of the gas tax, and familiarity with road usage charges (RUC). The research serves as a baseline measurement of public opinion prior to a pilot project that will launch in early 2018 and will also inform communications for the Road Usage Charge Project.

The telephone survey preceded five focus groups with Washington residents to gauge perceptions about transportation and assess interest in a possible road usage charge. The purpose of the research was to inform communications and recruitment for a road usage charge pilot project.

Research Methodology: The telephone survey consisted of 602 Washington residents and took approximately 17 minutes to complete. This is a sufficient sample size to assess opinions generally and to review findings by multiple subgroups, including age, gender, and area of the state.

Respondents were contacted by a live interviewer from a list of registered voters, which included cell phones (29% of participants were reached on cell phones). In gathering responses, a variety of quality control measures were employed, including questionnaire pre-testing and validation. Quotas and weighting were used to ensure that results are representative of the state's population. Results were weighted by age, gender, education, and area of the state. See Appendix A for complete participant demographics.

The five focus groups were held throughout July 2017 in the Tri-Cities, Spokane, Bellingham, Seattle, and Vancouver. Forty-five people participated in the groups. Participants were recruited from a list of registered voters. Efforts were made to ensure diversity by gender, age, income, political ideology, ethnicity, and area of region. See Appendix B for complete participant demographics.

Statement of Limitations: Any sampling of opinions or attitudes is subject to a margin of error. The margin of error is a standard statistical calculation that represents differences between the sample and total population at a confidence interval, or probability, calculated to be 95%. This means that there is a 95% probability that the sample taken for this study would fall within the stated margin of error if compared with the results achieved from surveying the entire population. The margin of error for the telephone survey is $\pm 4.0\%$.

The focus groups were led by a professional moderator and consisted of both written exercises and group discussions. Although research of this type is not designed to measure with statistical reliability the attitudes of a particular group, it is valuable for giving a sense of the attitudes and opinions of the population from which the sample was drawn.

This report highlights key findings from the focus groups. Each section reviews a major topic from the group discussions and includes representative quotations, as well as evaluative commentary. The quotes and commentary are drawn from both written exercises and transcripts produced from recordings of the group discussions. The referenced appendices provide the complete responses to all written exercises.

DHM Research: DHM Research has been providing opinion research and consultation throughout the Pacific Northwest and other regions of the United States for 40 years. The firm is nonpartisan and independent and specializes in research projects to support public policy making.

2.0 SUMMARY & OBSERVATIONS

Transportation is a top-tier priority for many Washingtonians. For those in urban areas, it may be the top priority.

Transportation is a top concern in the state, followed by education. Concerns about transportation are higher in urban areas, particularly urban areas in Western Washington. Residents see improved transportation—including better quality roads and bridges, congestion relief, and increased access to transit—as a benefit that would improve their quality of life.

Residents do not know the details of transportation funding, but they believe funding is increasing overall. The road usage charge topic will require an on-going public learning campaign.

Washington residents seem more aware of the gas tax than is typical in other states. Nearly half (45%) indicate that the current gas tax level is about what they thought they were paying and fewer than two in ten (16%) say they were not aware they were paying a gas tax. Knowledge does not run much deeper than awareness that gas taxes help fund transportation spending. The gas tax is primarily an out of sight, out of mind tax, and residents may like that.

Focus group results suggest most do not know how much they pay per gallon in tax or what their average gas tax bill per year might be. Yet the statewide survey reveals that half of residents (52%) think the gas tax is too much when they are told the actual amount. Awareness that there is a gas tax and a tendency to default to the idea that it is too much (whatever it is) may reflect media attention on this issue following implementation of gas tax increases over the past two years.

Educational messages about the link between fuel-efficient vehicles and transportation funding are credible and believable.

Most focus group participants believe transportation funding is increasing because they have heard about increases in the gas tax and registration fees, and because they believe recent population growth has provided a larger tax base. Although most said the dollars that go toward transportation are increasing, many were quick to point out that those dollars may not go as far due to increasing costs. Some skeptics said the state is not good at managing its resources. Residents are not typically making the connection on their own, however, that fuel taxes are decreasing as vehicles become more fuel-efficient.

To combat misconceptions and skepticism, information about the RUC pilot should include simple, informative points about the relationship between gas taxes and fuel-efficient vehicles. Many focus group participants were immediately receptive to this notion, but needed someone to help them connect the dots. Without laying this foundation, the necessity of a state research project may be rejected on the grounds that the government does not need additional funding.

Even those who support the idea of a road usage charge need additional information about how it would impact their lives. More than half of residents oppose road usage charges.

In the telephone survey, 58% oppose implementing a road usage charge. The survey format does not provide additional supporting information. Within a larger conversation about transportation funding that took place in the focus groups, most participants either saw it as a viable alternative to the gas tax or were open discussing it further. But even supportive participants needed additional information. Skeptics had

trouble envisioning how a charge would work or thought the cost of creating and administering a road usage charge would exceed the amount of revenue it could raise.

The most critical questions about a road usage charge are about accuracy, how users would report their miles, whether it would replace a gas tax or be levied in addition to it, and whether their personal information would be kept safe and not used for other—primarily commercial—purposes. The answers to these questions could have wide-reaching impacts on public support for a road usage charge, especially when it comes to the reporting methods available and the ability to choose between them.

Fairness may be a challenging feature of road usage charging to communicate. Ultimately, residents hope any new tax structure will be fair, but each resident defines fairness differently.

Descriptions of a road usage charge that focused on fairness were well-received by participants. Many had never considered that transportation revenue would decline as cars become more fuel-efficient, but they were receptive to such reasoning. Most, even those who admittedly drove much more than average, thought it was a fair way to tax residents.

However, many participants spoke about other elements of fairness, and not everyone agreed with the true meaning of “fair.” Some thought it would be fair for heavier vehicles to pay more per mile because they have a bigger impact on the roads. Others thought ability to pay should be considered so that a road usage charge does not negatively impact a low-income worker with a long commute or result in a large surprise bill at the end of the month. Those in rural areas thought it would be most fair if transportation funds were spent near where they were collected, at least for projects that sought to add capacity. While fairness itself is an attractive message to many, it is also interpreted in many ways.

Focus group participants are very interested in providing their feedback on road usage charging as part of a research project and view it as a meaningful way to engage diverse perspectives.

Nearly all participants said they were somewhat or very interested in joining a research project to test a road usage charge system. These participants saw a pilot project as a way to learn more about potential policy changes and to personally ensure a variety of perspectives were included in the research. Some saw it as a mode of meaningful civic engagement, and others were simply interested in cars, driving, transit options, and the quality of roads.

Participants were clear that many unresolved details would impact their decision whether to join the project. They needed to know how long the project would last, what time commitment would be expected of them, and whether they would need to restrict their transportation behavior in any way. Several participants said they would not want to join a research project if they could not choose their reporting method, primarily citing privacy concerns related to new technology or long waits at the Department of Licensing. Because purchasing a permit for a certain number of miles was far and away the most popular reporting method, additional details about permits during the research pilot may also color residents’ attitudes about joining.

3.0 RECOMMENDATIONS

Continue providing information about the pilot, with the understanding that it will be a long-term effort. Showing residents that their feedback is important to guide decisions will build goodwill.

About half of residents (53%) are familiar with the concept of a road usage charge. Low familiarity shows the need for information; it is also an opportunity to explain the benefits of researching alternatives like road usage charging. A concern for many is that a road usage charge is just another way for Washington government to tax people or that the state is trying to force a new system of taxation on residents. Address this early on: even many of those opposed to a road usage charge program see the value in a thorough research project that represents all viewpoints. When describing the pilot, highlight that no decisions have been made and that participant feedback will have a tangible impact on the decision-making process.

Start transportation conversations by addressing the public's values, such as access to the outdoors, time with family, or access to work opportunities. Congestion, safe and quality roads and bridges, and access to transit are top transportation concerns.

Transportation concerns evoke an emotional reaction. This emotion can drive interest, engagement, and motivation to change behaviors. Residents immediately link their state's transportation system to their quality of life, especially when it comes to perceived shortcomings. Messages that point to top areas for improvement—better roads and safer bridges, easier access to transit in both urban and rural areas, and reduced traffic—will speak to residents' values and pique their interest in the pilot program.

Address fairness in a direct and simple way. Fairness resonates with Washingtonians. Do not make fairness complex by adding details, such as technical details or more numbers.

Draft communications with an understanding that fairness is a complicated concept that means different things to different residents. Having all drivers share in paying for roads is a concern to Washington residents: if you use it, you help pay for it.

Although the concept of fairness in transportation funding is attractive to residents, they interpret the concept in different ways. If recruiting messages are too complex, residents may get bogged down in details about the program. While communications should be transparent about key elements of the program, a high-level approach may garner the most interest from residents.

Provide options in the pilot program.

Focus group participants showed a strong preference for purchasing an annual permit, but had many questions about how many miles they would be able to drive, how much the permit would cost, and what charges or refunds they would incur if they went over or under their miles. If the goal is to elicit resident feedback to guide these decisions, let potential recruits know that. Interested residents will want to be helpful and help shape state policy; the explicit opportunity to do so will be a draw for many. A successful recruit will likely require a choice in reporting method, as some residents value privacy over convenience, while others feel their time is more important.

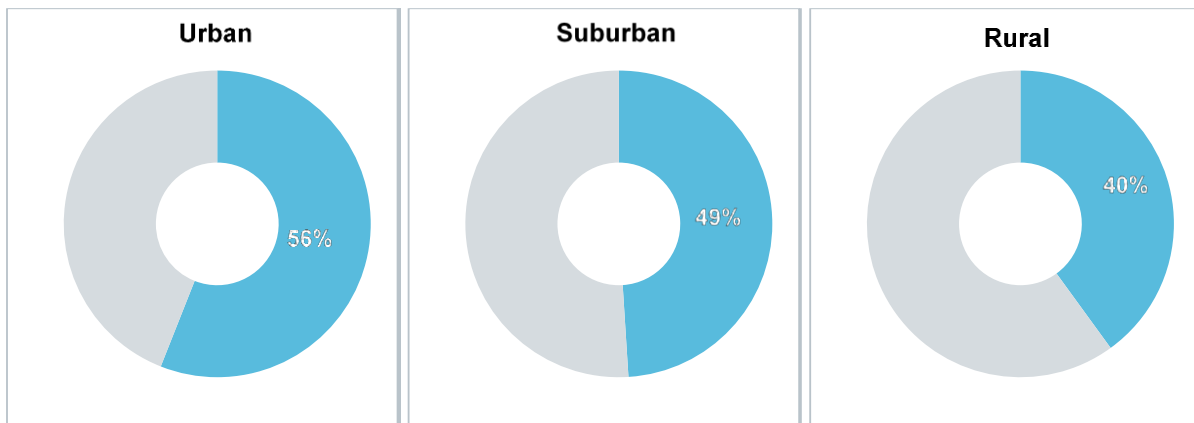
4.0 KEY FINDINGS

4.1 Community Priorities and Transportation

A plurality of Washington residents believe the state is going in the right direction.

More residents thought the state was going in the right direction (47%) rather than headed down the wrong track (40%). One in ten (13%) were unsure. Optimism was higher among urban residents, which is typically found in other surveys as well. Those with higher education were also more optimistic.

Chart 1. State Moving in the Right Direction



Source: DHM Research, June 2017

Transportation is often a top-tier priority for Washington residents.

When asked in an open-ended question what is the most important issue in Washington that they would like elected official to address, Washingtonians identified transportation (17%) and education (16%) as top priorities. Roads and infrastructure were the most common transportation concern, followed by traffic. Asking the question in an open-ended manner highlighted the issues that were top of mind for Washington residents without any prompting. These results tell us that transportation is an important concern overall.

Table 1. Important Issues in Washington

17%	Transportation
16%	Education
9%	Reduce taxes
5%	Healthcare
5%	Homelessness
5%	Political issues

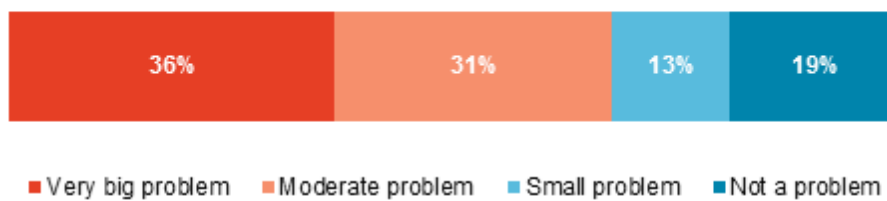
Source: DHM Research,

Focus group discussion validated the telephone survey findings. Participants in the groups also mentioned transportation as a major issue, alongside other issues such as education, housing availability and affordability, homelessness, and proper and effective governance.

Overall, a majority of Washington residents indicate traffic congestion is a very big or moderate problem in their community, and they link the transportation system to their quality of life.

Residents will most likely be looking to see solutions: 36% saw traffic congestion as a very big problem, almost double the amount that saw it as not a problem (19%), suggesting strong emotions about the issue.

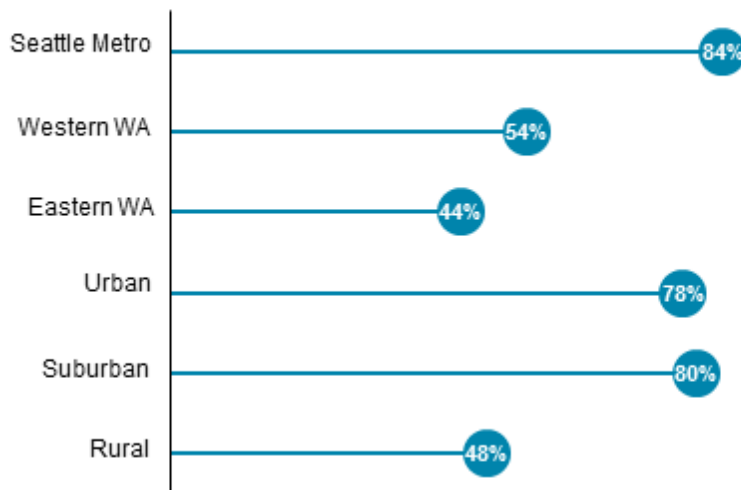
Chart 2. Traffic Congestion



Source: DHM Research, June 2017

Public perceptions of the magnitude of problem posed by traffic congestion varied across the state and by the type of region residents lived in. More of those living in the Seattle Metro area felt traffic was a problem; more of those in both urban and suburban communities across the state felt traffic was a problem.

Chart 3. Congestion is a Very Big / Moderate Problem



Source: DHM Research, June 2017

Discussions in the focus groups help illustrate the impact of traffic congestion on residents’ daily lives. Traffic was commonly mentioned both in Western and Eastern Washington focus groups.

"[Traffic] impacts my ability to travel to see family or do business. I would like to see improvements to the infrastructure and perhaps a through-lane."

–Bellingham

"Compared to when I first got here to now, traffic is horrible any time of the day."

–Spokane

Vancouver participants were the most concerned with transportation overall, citing congestion as their top concern. They discussed the impact traffic has on their ability to get to work, pick up their children from school and activities, and complete errands in the evenings.

"I know as I kind of look around for work, [I may be] actively passing up jobs that are in Portland. It is just like, 'Well, there are two extra hours onto my workday.' Now, I am going to factor that in, plus the gas, plus just the headache of it. I'm more inclined to look closer to the Vancouver side."

–Vancouver

"My ability to get across to a lot of the work and job opportunities in Portland. It tacks on an extra hour each way to my work day."

–Vancouver

One participant went beyond congestion to describe how vital transportation is to a healthy economy in Washington, and that, as such, transportation should be a top priority for Washington leaders.

"[Transportation] needs to be top three [issues for the state]. It needs to be healthcare, education, and roads. Because everything else, you've got to have smart people, you've got to have healthy people, and you've got to have ways to get goods and services moved around the state."

–Tri-Cities

Six in ten residents think Washington’s state highways are excellent or good, suggesting there will be some challenges in explaining the implications of the transportation funding outlook.

The majority of residents (64%) felt that state highways in their area were excellent or good. This suggests that they will not necessarily see a strong need for additional funding to maintain the roads. However, this question does not address congestion, which Washingtonians, particularly in urban areas, cited as the biggest transportation challenge.

Chart 4. Quality of State Highways



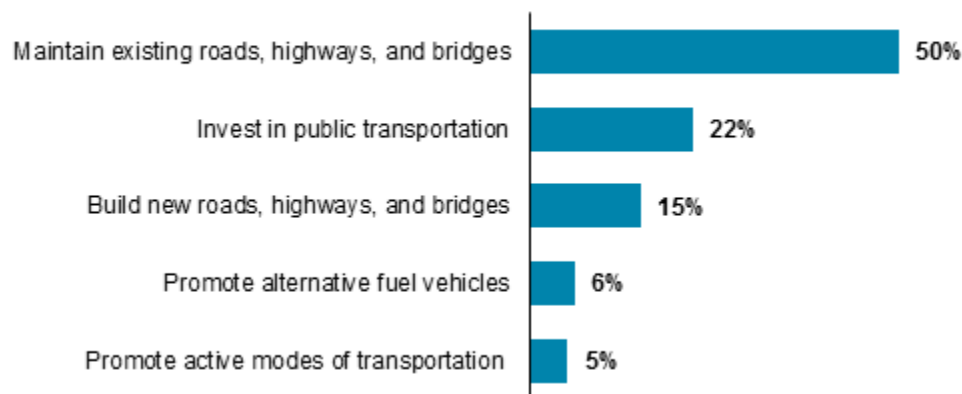
Source: DHM Research, June 2017

4.2 Perceptions of Transportation Funding

Residents prioritize maintenance of existing roads, followed by investing in public transportation.

Residents often prefer that funds go first to maintenance of existing resources, and that is in fact where half of Washington residents would like to see transportation funds directed. Public transportation investment was the second highest priority for residents (22%), which aligns with the funding of recent public transit packages in the Puget Sound area.

Chart 5. Top Transportation Priority



Source: DHM Research, June 2017

When it comes to specific improvements, residents hope to see improved maintenance and an eye toward population growth and road capacity.

When asked specifically about needed transportation improvements in their community, focus group participants expressed a desire for better road and bridge maintenance. Participants focused primarily on local roads and highways, rather than the Interstate (or intercity) highways. The issue of maintenance raised emotions in the group, who cited specific impacts of these perceived inadequacies.

“[A bridge] just collapsed. It hadn’t been maintained is what they decided. I think that’s really sad. It makes me angry. Why haven’t we kept things going? It’s really important.”

–Bellingham

“Potholes. Quality of roads. It seems to me like maybe they are using cheaper materials and that’s why we’re having the problems with the potholes.”

–Spokane

Those from Eastern Washington were more likely to mention inequalities between road maintenance in different regions of the state, but even participants in Seattle and Bellingham mentioned these issues. Throughout the groups, some participants continued to express opinions that Eastern Washington was not always treated fairly, that leaders in Western Washington made decisions about other communities rather than the communities themselves, or that transportation funding should be spent locally, where it was raised.

“The roads in Eastern Washington are not kept up as well as Western Washington or North part of Washington.”

–Tri-Cities

“Funding should be driven by region. Taxes collected on this side of the state should be used for improvements here.”

–Spokane

Participants from all regions also desired more evidence that their local and state leaders were acknowledging population growth and building additional capacity. As discussed throughout this report, participants believed several entities should be responsible for ensuring such improvements, including developers.

“Locally, one thing I see is there is a lot of development that happens without infrastructure, roads, that can meet the increased demand of apartments being built.”

–Spokane

“I think that the builder should take some responsibility when they are making all this money, building these subdivisions. They need to take some responsibility by adding the new roads and the new lights, because it takes the burden off of the rest of the taxpayers in the county, and it improves the quality of life.”

–Vancouver

Nonetheless, residents identified specific improvements to the transportation system in Washington.

Despite the shared belief that there was much work to do, focus group participants from across the state mentioned that some things have improved over the past few years. Some participants spoke positively about improvements that increased capacity and improved traffic flow.

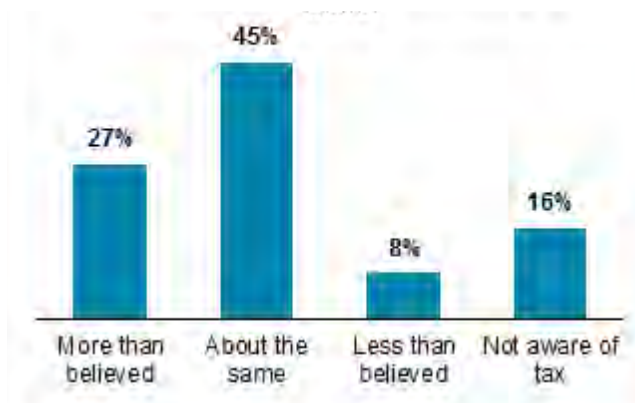
“Compared to when I was growing up, I remember 395, that’s how you got to Seattle on this two-lane road all the way. Things have improved a lot in the last few years.”

–Tri-Cities resident

Over four in ten say the current gas tax (about \$370 per year) is what they thought they were paying; about half say it is too much.

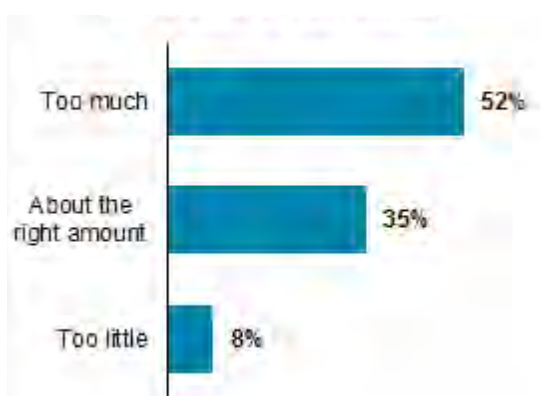
The 45% of Washington residents who said that the current gas tax level is about what they thought they were paying was higher than we have found in some other states. We typically find more people are unaware of the gas tax they are paying. Greater awareness in Washington may reflect media attention in the state following implementation of increases over the past two years. Half (52%) thought the gas tax was too much. This number may also reflect discussions around the state related to the gas tax increase.

Chart 6. Current Gas Tax Amount: Reality vs. Belief



Source: DHM Research, June 2017

Chart 7. Impression of Tax Amount



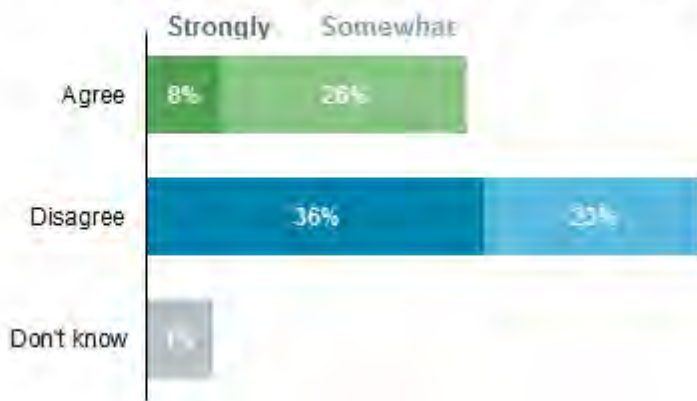
Source: DHM Research, June 2017

When we asked participants in the focus group in a more open-ended question how transportation is funded in the state, most participants identified the gas tax and vehicle registration fees as sources of transportation funding. This validated the level of awareness found in the telephone survey. There were still some possible misperceptions, nonetheless, with a few mentions of property, business and occupation taxes. Although more than half of participants could accurately cite sources of revenue, very few were able to say with certainty how much they paid in gas tax each year. Participants represented a variety of driving habits, but guesses ranged widely from a few hundred dollars per year to \$5,000.

Skepticism about how well the government manages transportation spending in Washington may pose a challenge for discussion about transportation funding.

A majority of residents disagreed that government does a good job managing transportation spending in the state of Washington. One in three disagreed strongly, suggesting some difficulty in moving opinion about the importance of a RUC pilot or recruiting participants. However, it may be more possible to impact perceptions among those who somewhat disagree, somewhat agree, or do not know.

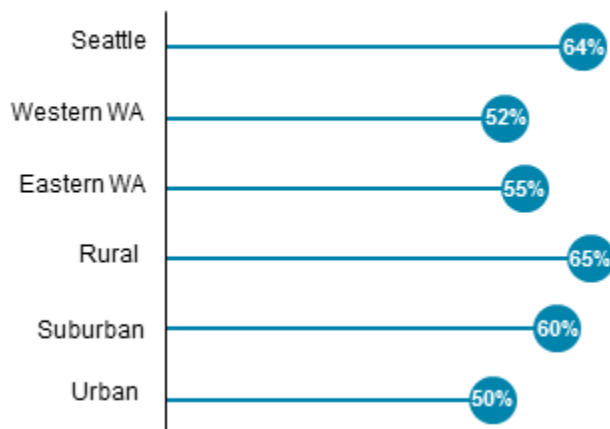
Chart 8. Government Manages Transportation Spending Well



Source: DHM Research, June 2017

Disagreement was higher in the Puget Sound area and in rural Washington. We would expect higher disagreement in rural Washington, consistent with the greater numbers of conservative voters in those areas. A recent gas tax increase and a large public transit package underway in the Puget Sound area may have colored residents’ attitudes in that region. Opinions in this area may be worth some additional research to probe residents’ concerns more fully.

Chart 9. Disagree: Government Manages Transportation Well



Source: DHM Research, June 2017

The vast majority of participants believe that funding for transportation is increasing, but many believe that costs associated with providing services are increasing at a faster rate.

Focus group discussions brought additional nuance to the overall picture of how Washington residents think about the transportation funding. Overwhelmingly, participants believed that transportation funding in the state is increasing. Participants pointed to two major reasons for this belief: population growth that has provided a larger tax base and increased gas taxes and vehicle registration fees. However, despite the

belief that actual dollars for transportation are increasing, most participants also thought that the cost of projects and transportation needs were increasing at an even faster clip.

“I said that it was increasing, based on the population increase within the area. The more people paying for gas, the more gas tax, the more funds going into the account.”

–Vancouver

“I’m assuming that the money going towards it is increasing, but the labor for the work itself being done is increasing at a faster pace. We’re paying more into it, but we’re getting less.”

–Spokane

Some participants were more skeptical and thought that while funding might be increasing, fewer improvements were being made due to government waste and inefficiency. These skeptics were a minority, but tended to hold the same views throughout the duration of the discussion. One pointed to a project that included an artistic design element as a clear sign of waste, while others were unable to offer specific examples.

On the other hand, some participants thought transportation funding is on the decline, without prompting, due to economic conditions and increased fuel efficiency. One participant specifically noted that the gas tax cannot remain a viable source of revenue for road maintenance in the future.

“I guess it’s decreasing. It’s being talked about a lot in the news. Revenue and things, we’re having issues and it hasn’t caught up.”

–Bellingham

“I think collection is going down. Just more efficient mileage. I think they are collecting less.”

–Vancouver

“The gas tax isn’t covering what we need to feasibly maintain the roads that we have. It’s not working.”

–Spokane

Many participants, especially from the eastern side of the state, feel strongly that funds collected for transportation should be spent locally.

Eastern Washington participants felt that leaders in other parts of the state were making decisions for their communities without the knowledge and experience of those living in Eastern Washington. They wanted to ensure that their region received its fair share of funding and they often expressed a desire that funds raised in Eastern Washington be spent locally to achieve that goal.

“I don’t want somebody in Seattle to make decisions for Tri-Cities when they have no idea what’s going on here.”

–Tri-Cities

Although these comments came up primarily in Tri-Cities and Spokane, some participants from Western Washington also mentioned the issue, seeking to ensure that all state residents benefit from road maintenance.

“I drew a distinction between maintenance, which everybody should participate in, versus new roads. Which, if you’re building a new road in Spokane County, people in Spokane County should pay for that road, I think, not people in Jefferson County.”

–Seattle

Many participants believe user fees are a fair way to charge motorists for roads, but several recognize that all residents benefit from transportation—even those who do not drive.

User fees were popular in each group, and participants brought them up frequently as a guiding principle that state leaders should consider in developing funding policies. Participants highlighted that user fees seemed to be a fair way of collecting revenue.

“I think with transportation it should be the people who use it the most pay for it the most. And I’m not convinced that the trucking industry, for instance, is paying truly their fair share of the cost.”

–Tri-Cities

“[User fees] take the burden off of those that really don’t use the highways as much anymore, such as our seniors.”

–Vancouver

Participants saw links between user fees and public transit. They noted that transit is funded in part through fares, and furthermore, thought a usage-based system of charging drivers could serve as an incentive to get residents out of their cars and help reduce emissions.

Although user fees were viewed positively, many participants did note that even residents who do not drive or spend much time on the roads still benefit from a healthy transportation system. These participants thought such considerations should play a role in determining public policy.

“You may not use the road a lot, but the ambulance is going to come when you have a heart attack. We need to maintain that. I hear a lot of, that the east side doesn’t want to pay for the west side. Why aren’t we two different states? I understand the mentality. ‘Why are we paying for Seattle?’ The thing is that the pool, when we all work together, is able to work much better.”

–Bellingham

One participant explained that, regardless of the sources of funding, the state should focus on the end goal: a transportation system that works for everyone and bolsters the state’s economy.

“I think for principle, the best way to fund it is to find the best way to effectively move people and products on the public roadways.”

–Spokane

4.3 Perceptions of Road Usage Charge

Information is needed to help increase understanding of road usage charging to support recruiting for the pilot.

Chart 10. Familiarity with Road Use Charge



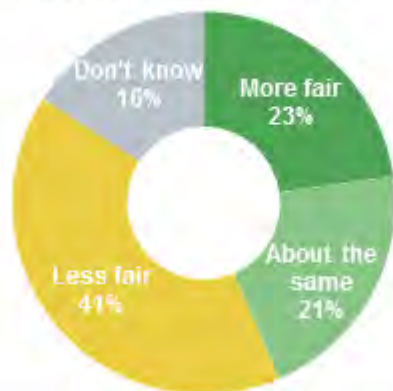
Source: DHM Research, June 2017

About half of residents (53%) were familiar with the concept of road usage charging, with 18% saying they were very familiar. This suggests the need for more information about road usage charging and also points to an opportunity to explain the benefits of researching and piloting an idea like road usage charging.

Washington residents are somewhat split as to how fair a road usage charge is; four in ten believe it is less fair.

In this baseline question about how they view a road usage charge, a plurality said it is less fair than a gas tax (41%). Two in ten thought it was about the same (21%) or more fair (23%), meaning 44% overall would view it as the same or better than a gas tax. Sixteen percent were unsure, reinforcing the need for public information about road usage charging.

Chart 11. Perceived Fairness of RUC



Source: DHM Research, June 2017

Positive attitudes in the focus groups coincide with an understanding that all drivers need to chip in the for the cost of road maintenance.

More than half of the 45 participants said their first impression of a road usage charge was either positive (19) or neutral (8). Those with positive impressions seemed to immediately understand the need for all drivers to chip in for the cost of road maintenance, even if their vehicle was especially fuel-efficient.

"I think it's positive. I drive a hybrid. That's on purpose. I feel like the state needs more money. I get that. I'm still using the road, but want them to be maintained. I feel that makes sense to me."

–Bellingham

"One of my first impressions is that I would be paying a lot, which makes sense. Yeah, it's fair. A lot of people wouldn't like it very much."

–Bellingham

Others had neutral views, and saw it as a good candidate for replacing the gas tax—which they saw as a similar revenue source. Some of these participants thought a road usage charge was even more fair than a gas tax, because of the impact of the gas tax on low-income drivers with older vehicles.

"I think we already have this. We have this now. We pay 49 cents for gas. The more you drive, the more you're burning in fuel. It's like a user fee. It's kind of the same thing."

–Tri-Cities

"I think the current system is actually quite a bit more unfair because what we have right now with a gas tax is a poor tax."

–Spokane

Of course, there were also participants who had negative impressions about a road usage charge (10), or expressed skepticism (8). Some participants believed a road usage charge would be levied in addition to the gas tax, echoing concerns from the quantitative research. Others thought the system sounded too expensive to create and maintain. Others bristled at the idea of charging drivers based on their mileage, considering many people commute long distances to get to their jobs. Participants did not always see a connection between drivers who already pay more in gas tax to commute long distances to their job and a possible road usage charge.

"They're not saying to take away the gas tax. They're just doing this in addition. This is a proposal."

–Bellingham

"I believe that the cost to maintain this [system] outweighs the loss of [gas tax] revenue."

–Tri-Cities

"Absolutely not! Some people commute for their jobs."

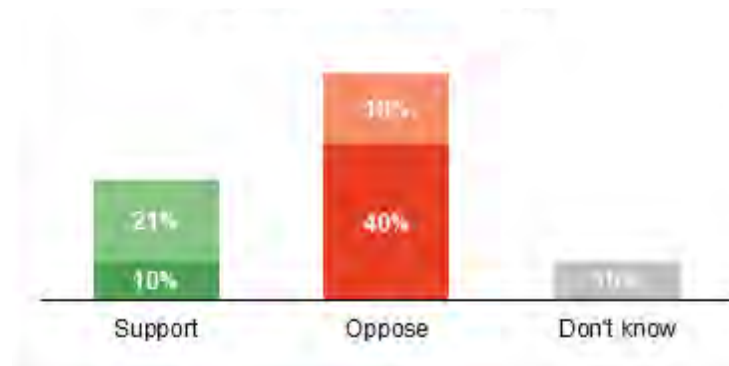
–Seattle

These initial impressions provide helpful guidance, but participants’ questions show that the details of any program will have a marked impact in how they perceive it. Concerns about privacy, government efficiency, and convenience are likely to be the biggest factors in perception.

Residents have reservations about switching to a road usage charging program.

A majority of residents (58%) opposed this type of transportation funding in Washington, with 40% strongly opposed.

Chart 12. Opinion: Road Use Charge



Source: DHM Research, June 2017

Opposition was higher in rural areas, although similar across Western and Eastern regions generally. Familiarity with road usage charging did not relate to levels of support: those who were familiar with road usage charging were neither more or less likely to support it. Beliefs about government spending were related to level of support. Those who thought they paid more than their fair share for public services more often opposed a road usage charge program, as did those who disagreed that government does a good job managing transportation spending in the State of Washington.

Residents are concerned about people paying their fair share and only paying one tax.

When asked what the most important issue was when thinking about paying a road usage charge, residents identified everyone paying their fair share as the most important (28%), followed by assurance that people not pay both a gas tax and per-mile charge (26%). Privacy issues were the third-highest concern (20%).

Chart 13. RUC: Most Important Issue



Source: DHM Research, June 2017

Common concerns from the focus group discussions included how a road usage charge would be monitored, how taxes would be collected, and whether their privacy would be respected.

Participants in the focus groups were also asked if they thought a road usage charge was a good idea. Of the 45 participants, 21 said that it was, while 16 said it was not. The remaining 8 participants were unsure. Regardless of support, participants had a slew of questions about how road usage charges would work.

Over the years, privacy has typically been a major concern for people learning about the idea of a road usage charge. Washington residents were also concerned about privacy, although concerns seemed slightly diminished. This may be due to rapid advances in technology and GPS-based apps in the last few years.

In fact, some participants thought the added ease of using technology to accurately track their mileage would be a worthwhile benefit. However, not all participants shared this opinion.

“[Automatic reporting] makes a lot more sense as a choice, but I know a lot of people who would just be up in arms about this if this was mandatory, because it’s a government regulation mandating a device on your vehicle. That’s where it starts to get into iffy territory.”
 –Spokane

“Who is going to allow them to put a GPS on their car?”
 –Tri-Cities

Many participants dwelled heavily on the mechanics of a road usage charge, including how mileage would be reported, how often they would be billed, how much the bills might cost, and what would happen in case of inaccuracies. Naturally, participants also wanted to know for certain whether a road usage charge would be in addition to the gas tax, or in lieu of it.

“It was a little scary at first because the first thing that popped in my head was like, ‘Okay, so how are they going to evaluate that? If it is not going to be considered a toll, then it is going to be per miles.’ Is it going to be treated as a property tax and based off your actual mileage when you report it? Is it done through the DOL? I was just thinking all of these things because I am a working parent, and I drive a lot.”

–Vancouver

More questions arose as participants mulled over whether a road usage charge was “fair,” a word with different meanings to different participants. Participants considered the impact heavier vehicles have on roads, the affordability of a road usage charge for low-income residents and seniors, and whether it would reduce the incentives for driving a fuel-efficient car.

“There has to be some kind of way to calculate the weight in there as well.”

–Bellingham

“If it is a senior, and their main travel is to and from their doctor’s appointments or something, I think there should be a minimum number of miles that are exempt.”

–Vancouver

“Either we want to encourage people to drive hybrid cars or we don’t.”

–Spokane

One concern that came up time and again regarded residents who drive out of state. Participants did not think it would be appropriate for the state to charge them for the use of roads outside Washington’s boundaries. Additionally, residents wondered about tourists, who purchase gas in the Washington, but would not contribute to a road usage charge if the state switched to that funding mechanism. There were also a few concerns about changes in car ownership and what would happen if a driver lent their car to someone.

“I was trying to determine, because we are so close to the border of Oregon, how are we going to determine [miles]? I spend half of my time driving in Oregon.”

–Vancouver

“I don’t like it. I just don’t think there’s a way to do it equally, fairly for everyone. People coming into the state, I just don’t think there’s a way of doing it fairly.”

–Tri-Cities

“My concern is how is going to be reported. Is it even practical at all? What if you, in the middle of the month, sell your car?”

–Vancouver

In addition to all these questions, some participants also wanted to know more about the context of road usage charging. It may be important to residents to know whether Washington is an innovator on the subject, or whether the method is tried and true.

“I would have to see what other states are doing to fund their roads. It seems very similar to the gas tax in the end.”

–Vancouver

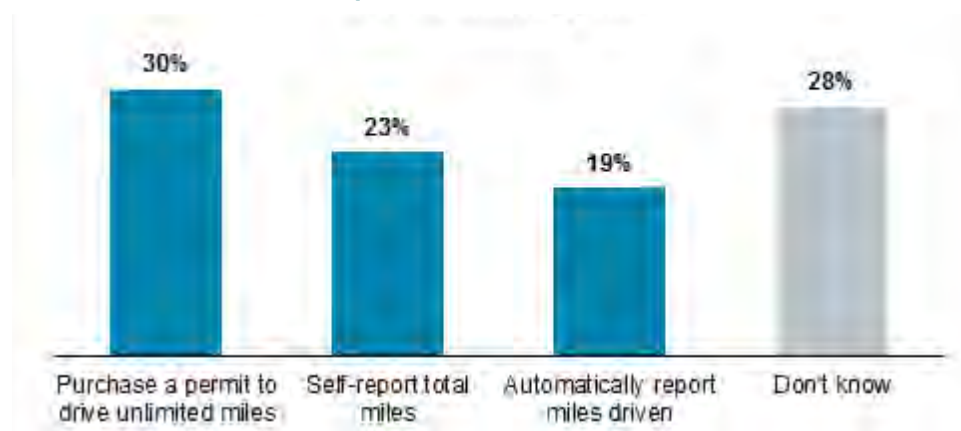
“If it works really well here, and it is something that we can incorporate nationwide, then that would be a really cool thing for everybody.”

–Vancouver

Overall, residents prefer the option of buying an annual permit—but the state’s answers to their questions may shift these opinions.

In both the survey and the focus groups, an annual permit was the preferred option among three potential methods (annual permit, self-report, automatic report). Preferences may shift substantially once more details about the specifics are known (particularly the price). In the phone survey, for example, nearly as many said they did not know (28%) as picked the annual permit (30%).

Chart 14. RUC: Preferred Options



Source: DHM Research, June 2017

Participants in the focus groups were introduced to the three methods of charging and were able to share their questions or concerns for each. Many of these questions echoed those they had asked earlier in the group, before they had information about the mileage reporting methods.

About half of participants indicated a preference for purchasing an annual permit, which they saw as convenient and non-invasive. In addition to price, participants wanted to know whether there would be multiple permits to choose from, each reflecting a different number of miles permitted per year. Additionally, they wanted to know what would happen if they went over or under their allowed mileage, or how a resident might account for loaning their car, or even selling it. Finally, they also wanted to know whether permits were created for individuals or vehicles, whether they would need to purchase one for each of their vehicles, and whether business and personal use would be treated the same.

“The permits, are they tiered? Scalable? It’s really [like] cellphone questions, right? What about overages? Do I get rollover minutes, if I don’t use all of mine up?”

–Bellingham

If future participants in a pilot project were offered only one permit—at a large cost that covered mileage much greater than average—this interest is likely to drop significantly.

Participants are concerned that if they self-reported their mileage they would be charged for miles driven out of state.

Although miles driven out of state was a significant concern regarding road usage charging generally, it was mentioned frequently in relation to self-reporting mileage. Participants wondered if they would have to manually record when they drove out of state, whether such miles could even be deducted from their charges, and whether their fellow residents would be honest in reporting.

A few participants asked whether they would need to bring each of their vehicles in separately to monitor mileage, which would add to the hassle of reporting. Several commented that spending extra time at the Department of Licensing did not sound appealing.

One candid participant lacked faith the road usage charge could be collected if someone chose to be dishonest.

“I chose the lazy way, put it in once and forget about it and then just don’t pay it. Trying to cheat the system. What are you going to do to me if I don’t pay? If you don’t pay the gas tax, you run out of gas.”

–Seattle

Automatically reporting mileage with the assistance of a device is viewed as convenient—and for many, an invasion of privacy.

Participants could be split into two camps regarding automatically reporting their miles: those who thought it would be easy, fair, and accurate, and those who were very uncomfortable with the idea. Regardless of their opinions, many had the same questions about how such a system would work and its feasibility.

For example, participants wanted to know if the device would rely on GPS or some other method, and whether the government or a private company would receive and own the data collected. They were curious as to whether the driver would pay for the device or if one would be provided and whether it could be used in older cars or by people without smartphones.

Those opposed were typically emphatic in their opinion that they would not want to engage in mileage tracking this way.

“If this happens, I would stop driving and sell my car.”

–Tri-Cities

“I don’t want that because I don’t want the government putting a little tracker in my car. They’re not just going to put how many miles they’re going.”

–Bellingham

“Most fair, but most invasive to personal freedoms.”

–Tri-Cities

Others were less skeptical, but had a lot of questions about how it would work. For example, they wanted to know if drivers could dodge fees simply by deleting the app or removing it from their vehicle. There were also concerns about accuracy and what recourse would be available in the event mileage was misreported.

“I wasn’t completely opposed to this. What kind of device is it? Is it GPS? Is it something that plugs into by OBD sensor and logs the miles and pull that out and go to the DMV once a year? I don’t have a problem with that.”

–Bellingham

“I think with the automatic one, and probably with all of them, how do you dispute it?”

–Bellingham

These differences in opinion illuminate the importance of choice for residents in any road usage charge pilot project. Because residents have vastly different opinions, habits, and desires, a variety of options may improve the success of recruitment for a pilot project. Participants discussed these concerns at greater length when they talked about reasons they may not be interested in joining a pilot project. Additional analysis of these comments may be found in **Error! Reference source not found.** Communicating.

4.4 Communicating

Residents find opposing arguments to be good ones—particularly that a road usage charge is just another way for government to tax people.

Throughout the telephone survey, results suggested residents held some doubt or skepticism about the government in relation to road usage charging. Reinforcing this theme, respondents were most receptive to the argument that *the charge is really just another way for the Washington government to tax people more*—39% stated it was a very good reason to oppose the policy (39%). Although privacy concerns looked to be lower than they have been in previous years elsewhere, nonetheless nearly one in three (32%) found that the *system will collect some personal information* to be a very good reason to oppose the policy as well.

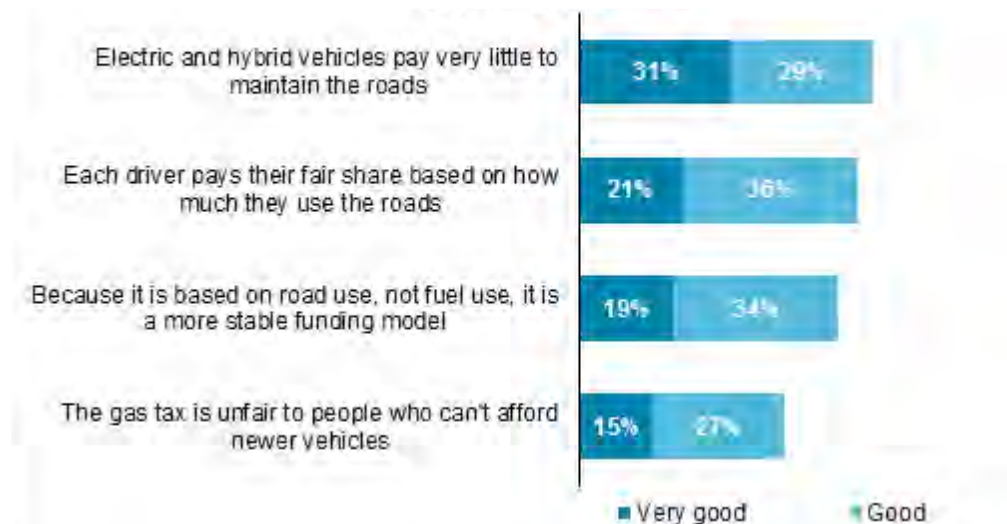
Chart 15. RUC Opposing Arguments



Source: DHM Research, June 2017

Residents heard four arguments in support of a road usage charge and indicated how good of a reason each was to support the policy. The idea that *electric and hybrid vehicles pay very little to maintain the roads* was the strongest (31% thought it a very good reason) in the telephone survey. Nonetheless, reasons to support a road usage charge were generally less convincing than reasons to oppose.

Chart 16. RUC Supporting Arguments



Source: DHM Research, June 2017

Fairness is an effective message for garnering support for a road usage charge pilot, but residents rely on different interpretations of what is “fair.”

Focus group research followed up on the quantitative research results in order to better understand how residents were thinking about this issue. Participants responded to four different reasons to support a road usage charge. Among these, the most compelling reason was that *road usage charges ensure each driver pays their fair share based on how much they use the roads*. This reason earned an average score of 1.9, where 1 is the most compelling reason and 4 is the least compelling.

That this reason was considered the most compelling is unsurprising considering the many comments participants made about the fairness of such a system. As they had already discussed, a road usage charge is rooted in the idea that those who use roads the most pay the most.

Participants talked at some length about the implications for low-income residents, namely that a system based on miles could be fairer than a gas tax because residents would not pay based on their ability to afford newer, fuel-efficient cars. Residents also mentioned that the weight of a vehicle should be considered to ensure a road usage charge was as fair as possible. These discussions show that a message focused on “fairness” may be compelling—but may also spark debate about the details of the policy that may either increase or diminish support among residents.

The second-most compelling reason to support a road usage charge was that *transportation funding is projected to decrease because people are buying less gas due to more fuel-efficient vehicles. A road usage charge would provide a more stable funding stream to maintain our roadways because it is based on usage, not fuel*. This message earned an average rating of 2.2.

As with the first message, the discussion presented pros and cons of such reasoning. Notably, many participants assumed transportation funding was increasing—although most of these participants did recognize that the costs of improvements are also rising. While residents may need additional information about transportation revenue in Washington, they are likely to be receptive to such information and to believe it, so long as they are reminded of the impact of more fuel-efficient vehicles on the road.

“I hadn’t considered that revenue was dropping because of fuel efficiency with vehicles. That is something that didn’t cross my mind at all until this evening.”

–Vancouver

The least effective message about road usage charging was *electric and hybrid cars pay very little per mile to maintain the roads because they use less gas, but people with inefficient cars pay lot more per mile because they use more gas. It’s only fair that every driver helps to maintain our roads*. Overall, this message earned a 3.0 rating.

Although this message also calls upon fairness, the highest-rated message was simpler. This message also draws attention to the issue of inefficient cars, but it does not distinguish between low-income residents who drive older cars for financial reasons and residents who may choose to purchase large, inefficient vehicles for other reasons. Rather than framing fairness as something all residents engage in, it singles out electric and hybrid vehicles. These factors are possible reasons participants rated this message as the least compelling.

Future communications about the pilot should inform the public about the cause of declining revenues to demonstrate need and build trust. While fairness is likely a strong motivator for residents, information

should remain simple. Otherwise, they may raise too many questions about details of the program that may distract potential recruits or muddy the waters.

4.5 Road Usage Charge Research Project

Despite questions about the details, nearly all focus group participants expressed interest in participating in a research project on road usage charging.

Of the 45 participants, 40 said they were very interested (29) or somewhat interested (11) in joining a *research project on road usage charging to test an alternative to the gas tax*. Participants were overwhelmingly interested, despite asking many questions about the research project and how it would be conducted.

Perhaps the most critical question was whether participants would be allowed to choose their reporting method. It was clear from participants' responses that they like to be able to choose the method that best fits their values and lifestyle. The recruitment process for the research project should highlight this option for residents to maximize the number of volunteers.

It was also critical that participants knew up front how much time it would take to participate and whether participation would be in person or online. Residents guessed that they might need to meet quarterly for an hour long, in-person discussion. Others thought they might need to spend a few minutes per week reporting their miles or filling out an online survey.

Some questions considered finer details and reflected earlier questions about road usage charging generally. These questions included whether driving behavior or vehicle ownership would be limited in any way by participating, what would happen in the event of car trouble or the sale of a car, and whether certain cars or participants would be ineligible. Participants also wanted to know how privacy would be protected if they used a device to track their miles.

Other questions were specific to the research project, rather than the concept of road usage charging. Participants' interest was piqued by the mention of an incentive, but they wanted to know specifically what it would be before they were ready to participate. Some participants thought incentives of \$100 per in-person discussion, while others thought they might receive gas cards, reimbursement of gas taxes, or free road usage charge fees in the future.

"It depends what you get. I'm sorry. How much money, or what is the incentive?"

–Seattle

Participants also wanted to know whether they would pay for a gas tax, road usage charge, or both during the project. It would also be helpful for potential recruits to know exactly how their feedback would be used. Messages that explain the purpose of the project should use the opportunity to inform residents that the state does not have plans to roll out a road usage charge, but is merely studying the issue. This information may build trust among more skeptical residents, who are inclined to believe the state is pushing for a specific policy.

It is also worth noting that focus group participants may have expressed a level of interest in the pilot project that exceeds that of the general public. These participants all share one trait in common: they already chose to spend some of their free time participating in research. Furthermore, when asked to share their interest in participating in a research project about road usage charging, they had already discussed

the issue for over an hour. They may have felt more invested in the concept than the average resident, and they had the benefit of learning additional details that the average resident may not have before them when they learn the state is recruiting participants.

Participants show interest in a research project because they want to share their experiences and values with state leaders and learn more about road usage charging.

Although participants cited many reasons for their interest in joining a state-led research project on road usage charging, the most common theme was that they simply wanted to know their opinions mattered to the state in its decision-making.

Of course, there were many nuances to this. Participants spoke about the importance of civic engagement, that it is a prime opportunity to “beta test” the technology before any decisions are made, and that they believed their own experiences could help round out the state’s collection of diverse perspectives.

“It’s a very interesting subject. It’s just like voting. I mean, you can sit around and complain all you want to, but if you have an opportunity to do something, you should do it.”

–Seattle

“It’s important to get as many viewpoints as you can. If it’s talking about guiding the state’s future funding policy, everybody should have a voice. There’s many variables.”

–Bellingham

Some residents were interested because of their driving behavior and interest in cars and the transportation system. These participants noted that they were heavy users of the roads. In addition to providing feedback from the perspective of someone who drives a lot, they would be able to test a road usage charge for themselves and uncover their preferences before any such system was, if ever, put in place.

“I think it would be helpful to know what all the options are and how they are going to work beforehand and to be able to get a feel for them.”

–Spokane

“I own a lot of vehicles and I drive a lot. Good roads, it’s enough to have an interest in roads being maintained well. I’m interested in it. I’ve followed it in the news. I read about it a little bit when it’s a headline.”

–Bellingham

At least one participant who balked at the concept of a road usage charge expressed deep interest in a research project.

“I’m just saying I am highly interested in participating, but for the completely opposite reason. I don’t like the idea of this. It’s more that I want to be convinced as to why this would be a good thing and how it would work because I don’t like it.”

–Spokane

Meanwhile, others saw transportation funding as reason enough to participate. One participant assumed the road usage charge would benefit all types of transportation funding, spurring interest in the project.

“The funding for improving our roads that goes to the DOT also goes for public transportation. Presumably, this is all for DOT, not just road maintenance. As a result, having some efficient method for increasing revenue for transportation, period, whether it’s roads or public transportation, mass transit, bikeways. It’s all integrated. That’s why I’m interested in it.”

–Bellingham

Some potential participants may respond well to this notion of multi-modal investment, particularly in urban areas where transit and biking are more common.

A successful recruit for a research project will almost certainly need the option of choosing their own reporting method.

Participants were clear from the moment they learned about a road usage charge generally that the reporting method would have a sizable impact on how they viewed the concept. As previously mentioned, there were those who preferred the ease of automatically self-reporting their miles, and those who said privacy was paramount and that they would rather purchase a permit or self-report their miles in person or by photograph.

When participants were presented with the idea of a research project, whether they could choose their method was a top question. Some assumed they would be able to do so; others were less sure and thought that perhaps the state would want an equal number of users for each reporting style and, accordingly, would assign volunteers to a method.

These disparate opinions were borne out in participants’ comments about why they may not want to join a research project. Their comments made clear that the wrong pilot design could immediately kill their interest.

“I absolutely hate going to the DMV. I hate sitting there for hours for sometimes the simplest of things. This would not have to be like that. If this was like that, forget it.”

–Bellingham

“Really strong opinions about the power of that information and how terrible our government is about protecting their own and our information. The metadata would be a gold mine if I were a nefarious character.”

–Vancouver

Interest in a research project could wane if potential recruits are not provided specifics about the required time commitment and incentive.

Participants also asked repeatedly for how much time the project would take, and the amount and type of the incentive they would receive. These concerns should be addressed in messages attempting to recruit participants. If such details are not revealed until participants have already expressed interest, it could lead to a large gap between those who say they are interested and those who ultimately sign up.

In addition to the time per month it would take to participate, potential recruits will also want to know how long the project lasts, whether they will need to participate in person or online, and whether in-person dates are flexible. For example, letting potential recruits know that in-person events will be planned

months in advance, with several dates to choose from, would go a long way in assuring them that they will remain eligible to participate.

One participant also wanted some assurance that they would be testing the concept of a road usage charge, not testing the device used to track miles.

“How far along is the development of the device? Are there going to be any glitches with that we’re going to have to work out? I don’t want to be burdened with anything else.”

–Bellingham

Recruiting materials should highlight the opportunity for residents to shape policy and the future of the state.

Participants were provided with a series of messages designed to recruit volunteers to a road usage charge research project. In addition to ranking the messages, participants also pointed to words and phrases they liked, and did not like.

In line with participants’ previous comments about the importance of civic engagement and sharing their opinions, they responded positively to phrases like *shape our state’s future and guide future funding policy*. Some participants appreciated the call-out to *urban, suburban, and rural participants*—a phrase that many Eastern Washingtonians may find encouraging. Several participants also said they liked knowing that *volunteers will receive an incentive*, although the message about incentives was ranked only average overall.

The top-rated recruitment message was: *“The research project is a unique opportunity for Washington drivers to “test-drive” a road usage charge and share their experiences. Your preferences can help shape future funding policy.”* This message was rated 1.9 on a scale of 1 to 6, where 1 was the most compelling reason to join a research project and 6 was the least compelling. It fared better than other messages about the importance of resident feedback.

Four of the six messages earned average scores of 3.0 to 3.8, although one message fell flat. *The pilot is being sponsored and implemented by the State of Washington* did not entice participants to the recruit. However, as discussed in **Error! Reference source not found.** Final Remarks, some participants made clear that receiving messages from the state about the project would be helpful—it just was not a reason to join the project.

There were only a few questions about these messages. One participant wanted clarity about the meaning of a “pilot”, and a few asked again what incentive the state would provide.

4.6 Final Remarks

Many residents are responsive to official information from the Department of Transportation or the Department of Licensing, but they do not want to hear about it from politicians.

Many participants mentioned they would read and respect communications from official state agencies, like DOT and DOL, regarding a road usage charge research project. However, these agencies were not trusted by participants across the board.

“Department of Licensing I would pay attention to because it has to do with my car.”

–Seattle

“I like the DOT. Some type of PSA flyer or mailing. Some really good, descriptive flyer that would talk about the research project.”

–Bellingham

Several participants mentioned that they wanted to hear from “customers who have used it” already. If it is possible to incorporate the experiences of users in other states, such messages may be helpful in building confidence among Washingtonians.

Some participants simply listed media outlets such as local papers, news broadcasts, and radio programs as credible sources of information. These avenues provide a good platform for agency leaders or commission members to share information about the program. A question-and-answer format can provide potential recruits with assurances about the purpose of the project, time commitments, and incentives. Based on participant feedback, the spokespeople in the media should be officials—but not politicians.

Universities and other independent research entities were also cited by some participants as a good source of unbiased information. Partnering with such organizations may boost interest during the recruitment phase if the organizations represent both Western and Eastern Washington.

A few participants also expressed concern about the involvement of private businesses, such as the device and app creators, in the process. These concerns related primarily to fears about the use of their data, and whether the motivation for the project would really be to collect data, or to make money from the technology.

“It would have to be something official, and I’m thinking like an official ‘wa.gov.’ Because, I think if some independent company that I’ve never heard of says, ‘We’re the ones running this test,’ I would kind of go, ‘Who are you, and what is your motive?’ As much as we might doubt the motives of politicians, nevertheless, if it was couched in an official statement or official printed matter, I’d be more likely to trust that.”

–Tri-Cities

“I’m not sure that I would trust anymore. I’m more likely to trust the state government than the manufacturers of the equipment that are just trying to do something new and make more money on new technology.”

–Bellingham

On the other hand, other participants thought a third-party could ensure an appropriate firewall between personal data and state government. These differing concerns emphasize the opportunity to provide a variety of reporting methods to potential recruits and let them choose their favorite.

“I think having a third party who is just completely unbiased, there’s no corruption there, no reason to dillydally with the system.”

–Seattle

Ultimately, participants want to ensure that their state leaders consider all viewpoints when making decisions about revenue so that residents are treated fairly.

Participants had a lot of advice for state leaders as they move forward in their research about a road usage charge. Many comments related to aspects of fairness—which, again, meant different things to different people. Most comments provided feedback on how an ultimate road usage charge should be implemented,

if at all. For example, one noted that a road usage charge’s billing system should be fair to low-income residents. Another noted that it’s important to retain incentives for people to reduce their carbon footprint.

Others reiterated their concern as to whether a road usage charge would net more revenue than it would cost to implement and maintain or whether it would cost more than the current gas tax.

“Basically, [I want to know] how the cost of implementing the project and maintaining it would weigh against the monies gained by the project. Would there be incentives for economically disadvantaged individuals, or is it just going to be across the board for everybody?”

–Spokane

“I’d like to see a comparison of the gas tax now and about how much you pay per mile with the gas tax the way it is now, and then what it’s going to be. If it’s a little more, it’d be great, but if it’s a lot more, forget it.”

–Seattle

Some participants used the opportunity to ask questions about the broader goals of a road usage charge, illuminating the importance of information that shows participants exactly what the state is trying to achieve—beyond simply “more revenue.”

“How does it fit into the larger picture? How does it make Washington more competitive in the national and global stage? How would it improve the quality of life for all residents of Washington? Is it fair? Does it increase or decrease income inequality?”

–Tri-Cities

In moving forward with communications, it will be a challenge to address all residents’ concerns about fairness at the same time—because residents have unique and nuanced interpretations of fairness. As such, a variety of messages that speak to different elements of fairness may help increase interest during the recruitment phase.

“It seems like a very fair way to go. It seems those that use the roads should pay to contribute the revenue to maintain it, to improve it. The one thing that did come to mind [is the impact on] low-income households.”

–Vancouver

“It’s not about ‘fair.’ Fair is a family being able to cross a bridge without it falling down. Fair is the owner/operator of a semi-trailer getting home on time. Fair is the commuter being safe as they head home. Fair is options for everyone to enjoy the beauty and opportunities in the state. Fair is not making everything equal. Fair is a safer, transparent, and focused vision for transportation.”

–Bellingham

5.0 APPENDICES

Appendix A. Annotated Phone Survey

Washington State Transportation Commission Telephone Survey

June 2017

Washington State Residents

N=602; ±4.0% margin of error

17 minutes

DHM Research

Project #00583

INTRODUCTION

Hi, my name is _____ and I'm calling with DHM Research, a public opinion research firm in Oregon. I'm calling about important issues in your community. May I please speak to _____ **(Must speak to name on list. If unavailable, schedule call back).**

If necessary: The State of Washington wants to hear from residents; your feedback will help to inform decisions. /DHM has locations in Seattle and Portland.

WARM UP

1. Do you feel things in the State of Washington are generally going in the right direction, or do you feel that things are headed down the wrong track?

Response Category	n=602
Right direction	47%
Wrong track	40%
(DON'T READ) Don't know	13%

2. What is the most important issue in Washington that you would like your elected officials to address?
(OPEN)

Response Category	n=602
Transportation (NET)	17%
Roads/Infrastructure	7%
Traffic	5%
Transportation—general	4%
Rapid transit issues	1%
Education	16%
Reduce taxes	9%
Healthcare	5%
Homelessness	5%
Political issues/Corruption	5%
Affordable housing	4%
Resist Trump	4%
Jobs/Economy	3%
Crime	3%
Environment/Clean energy	3%
Budget/Spending	3%
All other responses	2% or less in each category
Nothing	2%
Don't know/No answer	5%

3. Do you think you pay more than your fair share, less than your fair share, or about the right amount for public services in Washington?

Response Category	n=602
More than my fair share	42%
Less than my fair share	3%
About the right amount	50%
(DON'T READ) Don't know	5%

4. Is traffic congestion in your local community a very big problem, moderate problem, small problem, or not a problem at all?

Response Category	n=602
Very big problem	36%
Moderate problem	31%
Small problem	13%
Not a problem at all	19%
(DON'T READ) Don't know	1%

5. How would you rate the quality of state highways in your area? Are they excellent, good, poor, very poor

Response Category	n=602
Excellent	5%
Good	59%
Poor	26%
Very poor	8%
(DON'T READ) Don't know	2%

6. About how many total miles do you drive each year? (OPEN)

Response Category	n=602
Less than 10,000 miles	41%
10,000-19,999 miles	32%
20,000 or more miles	20%
Mean	12,652
Don't know	7%

7. About what percentage of those miles are driven in Washington? (OPEN)

Response Category	n=602
0%	7%
1-80%	14%
81-90%	18%
91-99%	16%
100%	42%
Don't know	4%

TRANSPORTATION PRIORITIES AND FUNDING

8. Thinking about transportation improvements in Washington, I'd like to read a list of transportation priorities over the next 10 years. Which one of these options do you think should be the highest priority, second highest, and third highest priority for making improvements in the state?

Response Category	First n=602	Second n=602	Third n=602	Combined n=602
Maintain/Preserve Washington's existing roads, highways, and bridges	50%	26%	11%	87%
Build new roads, highways, and bridges	15%	24%	21%	60%
Promote alternative fuel vehicles like hybrids and electric vehicles	6%	16%	19%	41%
Invest in public transportation, such as transit	22%	23%	22%	67%
Promote active modes of transportation like bicycling or walking	5%	8%	20%	33%
Don't know	2%	3%	7%	2%

In Washington, gasoline taxes are about 49 cents per gallon. At the rate of 49 cents per gallon, a typical driver pays about \$370 per year.

9. Is this tax: More than you thought you were paying, about the amount you thought were paying, less than you thought you were paying, or you were not aware you were paying?

Response Category	n=602
More than thought paying	27%
About the amount thought paying	45%
Less than the amount thought paying	8%
I was not aware I was paying	16%
(DON'T READ) Don't know	4%

10. Is this tax too much, about the right amount, or too little?

Response Category	n=602
Too much	52%
About the right amount	35%
Too little	8%
(DON'T READ) Don't know	6%

11. How familiar are you with the concept of a road usage charge, where drivers pay for the miles they drive? Would you say very familiar, somewhat familiar, not too familiar, or not at all familiar?

Response Category	n=602
Very familiar	18%
Somewhat familiar	35%
Not too familiar	18%
Not at all familiar	28%
(DON'T READ) Don't know	1%

These next few questions are about a potential road charge. In road charging, drivers pay based on the miles driven on Washington roads, instead of paying a gas tax based on how many gallons of gasoline is purchased. A road charge would **replace** a gas tax.

Because of improving fuel efficiency and the increasing number of electric and hybrid vehicles, gasoline consumption is projected to decrease. As a result, revenue generated by the gas tax is also projected to decrease and is already not keeping up with the cost of repairing roads. In addition, some drivers pay far more gas tax for each mile they drive than others do. One idea, to ensure all users help pay for repairs, is to eliminate the gas tax and replace it with an equivalent charge on the number of miles you drive.

12. Do you believe that eliminating the gas tax and paying a road charge based on the number of miles you drive would be: More fair/less fair/about the same/Don't know

Response Category	n=602
More fair	23%
Less fair	41%
About the same	21%
(DON'T READ) Don't know	16%

13. Knowing that gas-tax revenues are projected to fall, do you support or oppose implementing a mileage-based road usage charge program in Washington as a way to fund transportation? Is that strongly or somewhat?

Response Category	n=602
Strongly support	10%
Somewhat support	21%
Somewhat oppose	18%
Strongly oppose	40%
(DON'T READ) Don't know	10%

14. If the state were to consider a road charge, which one of the following three options would you prefer? (Randomize responses)

Response Category	n=602
Purchase a permit to drive unlimited miles up to one year	30%
Self-report total miles driven annually	23%
Automatically report miles driven annually using a smartphone or in-vehicle technology	19%
(DON'T READ) Don't know	28%

15. Thinking about paying a road charge based on the number of miles driven instead of the gas tax, tell me which is the most important issue to you? (Randomize responses)

Response Category	n=602
Ensure that I not pay both a per-mile charge and a gas tax	26%
Having a choice in how I report and pay for miles driven	7%
Protect my personal information	20%
Everyone pays their fair share for road use	28%
Visitors from out of state pay their fair share	8%
(DON'T READ) Don't know	11%

MESSAGING TEST

[ROTATE SUPPORT VS OPPOSE BLOCKS]

Please tell me if you feel each statement is a very good reason, good, poor, or very poor reason to oppose road usage charge? [ROTATE MESSAGES]

Response Category	Very Good	Good	Poor	Very Poor	Don't know
16. People who drive more miles pay more than people who drive few miles with a road usage charge.	24%	32%	26%	10%	7%
17. A road usage charge system will collect some personal information like how many miles you drive. Some people are concerned about protecting their privacy.	32%	29%	22%	10%	6%
18. It will be too much of a hassle for drivers to report vehicle mileage data and pay for road usage.	31%	28%	26%	10%	5%
19. A road usage charge is really just another way for the Washington government to tax people more.	39%	22%	22%	12%	6%
20. The road usage charge will not properly identify those who drive across state borders or drivers from out of state who should be paying a road usage charge	29%	37%	18%	8%	8%
21. Road usage charge is unfair to people who buy fuel efficient vehicles. These people are doing the right thing for the environment and should get a break.	23%	27%	28%	15%	7%

Please tell me if you feel each statement is a very good reason, good, poor, or very poor reason to support road usage charge? [ROTATE MESSAGES]

Response Category	Very Good	Good	Poor	Very Poor	Don't know
22. The gas tax is unfair to people who can't afford newer vehicles. They pay more because they own less fuel efficient vehicles that use more gas.	15%	27%	32%	20%	7%
23. A road usage charge would provide a sustainable and long-term model for transportation funding because it is based on road use, not fuel use. Road use is a more stable funding model.	19%	34%	22%	17%	8%
24. People are driving more fuel efficient vehicles and putting wear and tear on the roads but paying less in gas tax to maintain these roads. Electric and hybrid vehicles pay very little to maintain the roads. It's only fair that every driver helps pay to maintain our roads.	31%	29%	18%	15%	7%
25. With road usage charges each driver pays their fair share based on how much they use the roads and not based on the fuel efficiency of their vehicle.	21%	36%	21%	15%	7%

ORGANIZATION IMPRESSIONS

26. Do you agree or disagree with the following statement: Government does a good job managing transportation spending in the state of Washington. Is that strongly or somewhat?

Response Category	n=602
Strongly agree	8%
Somewhat agree	26%
Somewhat disagree	23%
Strongly disagree	36%
(DON'T READ) Don't know	7%

DEMOGRAPHICS

27. How many people live in your household, including yourself? [OPEN —Record Exact]

Response Category	n=602
1	11%
2	36%
3+	50%
Refused	3%

28. Which of the following best describes your race or ethnicity? (allow for multiple responses)

Response Category	n=602
African American/Black	2%
Asian/Pacific Islander	3%
Hispanic/Latino	3%
Native American/American Indian	2%
White/Caucasian	80%
Other	6%
(DON'T READ) Refused	4%

29. In general, would you describe your political views as very conservative, conservative, moderate, liberal or very liberal?

Response Category	n=602
Very conservative	6%
Conservative	22%
Moderate	39%
Liberal	18%
Very liberal	8%
(DON'T READ) Refused	8%

30. Party (RECORD FROM SAMPLE)

Response Category	N=602
Democrat	51%
Republican	34%
Independent	2%
Other	--
Non-affiliated	13%

31. How would you describe the area that you live in?

Response Category	n=602
Rural	36%
Urban	22%
Suburban	39%
(DON'T READ) Don't know	2%

32. Age (punch from sample)

Response Category	n=602
18-24	15%
25-34	15%
35-54	24%
55-64	28%
65+	18%

33. Do you describe your gender as: (PHONEASK)

Response Category	n=602
Male	50%
Female	50%
Non-binary or gender non-conforming	--

34. Zip code (punch from sample)

35. County (punch from sample)

Response Category	n=602
King County/Pierce/Snohomish	52%
Western WA	26%
Eastern WA	22%

36. Which category best describes your 2016 gross household income, before taxes? Remember to include everyone living in your household. Your best estimate will do.

Response Category	n=602
Less than \$25,000	12%
\$25,000 to less than \$50,000	15%
\$50,000 to less than \$75,000	17%
\$75,000 to less than \$100,000	13%
\$100,000 to less than \$150,000	12%
\$150,000 or more	5%
(DON'T READ) Refused	26%

37. What is the highest level of education that you have completed?

Response Category	n=602
Less than high school	1%
High school diploma	33%
Some college / 2-year degree	36%
College degree / 4-year degree	21%
Graduate/professional school	9%
(DON'T READ) Refused	--

Appendix B. Participant Demographics

WSTC Focus Groups

DHM Research #00582

Group #1: 7/6/16; Tri-Cities; N=10

Group #2: 7/8/16; Spokane; N=10

Group #3: 7/17/17; Bellingham; N=9

Group #4: 7/18/17; Seattle; N=7

Group #5: 7/25/17; Vancouver; N=9

City and Zip Code

Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Benton City//99320	Spokane Valley //99206	Bellingham//98225	Bothell//98012	Vancouver//98661
Kennewick//99336	Spokane//99204	Bellingham//98225	Kent//98042	Vancouver//98661
Kennewick//99336	Spokane//99205	Bellingham//98225	Seatac//98198	Vancouver//98662
Kennewick//99337	Spokane//99207	Bellingham//98225	Seattle//98103	Vancouver//98665
Richland//99352	Spokane//99208	Bellingham//98226	Seattle//98104	Vancouver//98665
Richland//99352	Spokane//99216	Bellingham//98226	Seattle//98109	Vancouver//98665
Richland//99354	Spokane//99218	Bellingham//98229	Snohomish//98290	Vancouver//98682
Richland//99354	Spokane//99223	Bellingham//98229		Vancouver//98682
Richland//99354	Spokane//99223	Ferndale//98248		Vancouver//98685
No response//99301	Veradale//99037			

Where They Live

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Urban	6	5	4	4	--
Suburban	4	4	3	2	9
Rural	1	1	2	1	--

Occupation

Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Admin Assistant	Adult/Child Caregiver	Software Engineer	Bartender/Server	Accounting
Assistant Winemaker	Architect	Help Desk Technician	Distributor (Wristbands)	Accounts Payable
Lab manager	Banking	Life Coach/ Support Staff	Health Ins. Help, PA Referrals	Classification Counselor
Manufacturing Tech	Billing Specialist/ Accounting	Owner, Antique Business	Homemaker	Homemaker
Mechanical Engineer	Billing Supervisor	Production Management	Mobile Phlebotomist	Purchasing Agent
Member Service Representative	Construction Management	Professor	Non-profit Development	RN & Student
Retired Firefighter	CPA	Semi-retired, Self-employed	Sales	Sales
Self-employed Furniture Repair	Entertainment/ Event Planner	Stay-at-home Mom		Sales
Business Owner (House Cleaner)	Registered Nurse	Teacher		Sales Manager
No response	Wave Merchandising			

Miles Driven in a Year

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Less than 5K	1	2	2	3	2
5K – under 10K	2	1	5	--	--
10K – under 15K	2	3	1	2	5
15K – under 20K	1	3	--	--	2
20K – under 25K	3	1	--	2	--
25K – under 30K	1	--	--	--	--
30K or more	--	--	1	--	--

Method of Commute (Multiple responses accepted)

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Drive	7	10	8	5	9
Walk	1	--	--	1	--
Bike	--	--	--	--	1
Someone else drives me	--	--	--	--	--
Taxi/Uber/Lyft	--	--	--	--	--
Public Transit	1	1	--	1	2
Other: ["Motorcycle"]	1	--	1	--	--
Other: ["Retired"]	1	--	--	--	--
Other: ["Work from home"]	--	--	--	1	--

Education

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Less than high school graduate	--	--	1	--	--
High school graduate	1	1	--	--	1
Some college; technical school; community college; 2-year degree	6	4	2	4	2
College degree; 4-year degree	2	4	4	2	4
Graduate degree	1	1	2	1	2
No response	--	--	--	--	--

Household Income

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Less than \$25,000	1	2	1	1	1
\$25,000 – \$49,999	2	4	3	3	3
\$50,000 – \$74,999	2	1	3	2	3
\$75,000 – \$99,999	4	1	1	--	2
\$100,000 – \$150,000	1	1	--	--	--
More than \$150,000	--	1	1	1	--
No response	--	--	--	--	--

Political Party

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Democrat	2	3	4	4	4
Republican	4	3	2	2	1
Other ["Conservative"]	--	1	--	--	--
Other ["Independent"]	3	--	2	--	--
Other ["Independent, lean Democrat"]	--	1	--	--	--
Other ["Libertarian"]	--	--	1	--	--
Other ["Moderate/Independent"]	1	--	--	--	--
Other ["Unaffiliated/Nonpartisan/ No party"]	--	1	--	--	2
Other [Nothing specified]	--	1	--	1	--

Age

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
18 – 24	1	--	1	--	--
25 – 34	2	2	1	1	3
35 – 44	1	3	2	1	2
45 – 54	4	--	2	1	2
55 – 64	1	3	1	4	--
65 – 74	1	1	2	--	2
75+	--	--	--	--	--
No response	--	1	--	--	--

Gender Identity (Multiple responses accepted)

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
Male	4	4	5	2	3
Female	6	6	4	5	6
Non-Binary or Gender Non-Conforming	--	--	--	--	--
Other	--	--	--	--	--

Race/Ethnicity (Multiple response accepted)

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver
White/Caucasian	9	9	8	6	6
Black/African American	--	1	--	2	1
Spanish/Hispanic/Latino	--	--	1	--	2
Asian Pacific Islander	--	--	1	1	--
Native American	1	1	1	1	--
Other:	--	--	1	--	--

Appendix C. Written Exercise 1

Make a list of issues in Washington that you would like to see improved. Place a star (*) by the one that is most important to you

Tri-Cities

- *Agriculture; Employment; Wates; Infrastructure
- *Cleanup at Hanford; Less division in the state; Politicians more evenly represent the state; Get rid of Bob Ferguson
- *Education; Homeless; Drug addiction; Social services
- *Fishing— warm water and walleye, not salmon or trout; Parks; Infrastructure, roads, bridges; Parks
- *Healthcare; Education; Income inequality; Living wage; Infrastructure
- *Justice system; Community engagement; Equality of rights; Confidentiality of our personal lives/more open to events
- *King County not being the deciding factor for eastern Washington or all of Washington total; Wasteful spending (west side); Taxes; Game management
- *Make a balanced budget that works for everyone. Cut out a lot of the fluff; Don't allow pot stores near schools or parks.
- *School curriculum; Roads; Education/Resources available to others.
- *Transportation/roads— fix; Schools— better.

Spokane

- *Care of homeless; Like to see legislature address issues important to more rural, less populated areas; Minimum wage
- *Education reform; Health care; Road improvement
- *Guaranteed maternity leave; Homeless population downtown; Minimum wage hike
- *Housing availability; Work standards enforcement
- *Less invasive tax of business; Improved road maintenance program; Fewer government programs
- *More representation for Eastern Washington (tax revenues etc.); Better funding for education; Better use of tax money; More competition for utilities (Avista)
- *Stricter punishments for animal abuse; Quality of the roads in the winter; Stricter punishments for DUIs
- *The treatment of people of color when it comes to law enforcement; Safer communities; More activities for kids in school, after school, trips, etc.
- *Too many liberals on west side so our votes don't matter; Road conditions in Spokane; Traffic in Seattle
- *Transportation; Health care (insurance)

Bellingham

- *Addressing the homeless/jobs; Healthcare; Infrastructure, bridges taken care of; Housing for young; Families; Support for families
- *Affordability—cost of living; Population density; Traffic
- *Education; Public transportation; Cost of Living
- *Housing; Traffic; Childcare; Healthcare; Education; Homelessness; Health of children (support for children/teens); Global (earth care)

- *I-5 corridor through Seattle Metro Area; Writing a budget
- *Incentives for sustainable organizations; Traffic in Seattle; Better mass transit; Homeless resolution
- *Land use restrictions; Public transportation, especially rural; State budget
- *Land use; Water rights; Sanctity of life
- *Thru-trails for non-motorized; Parks/open spaces; Staunch climate change support

Seattle

- *Education; Healthcare; Homelessness; Transportation; Budget
- *Fix congestion/traffic; Lower property taxes; Able to put wells on raw land for personal houses; Get a better mayor.
- *Gun violence; Homelessness; Housing costs; Schools (more arts/music programs); Rebuild Seattle/plumbing system in schools
- *Homelessness; Drug epidemic; Mental health; DUII
- *Less traffic and road construction; Better ways of transportation — like a subway; No tolls/Good to Go!
- *Roads/freeways; Healthcare; Speed limits upped in some areas
- [No star] Allocation of tax revenue; Crime; Homelessness; Education

Vancouver

- Dental care availability; Mental healthcare coverage/approach; Sex trafficking
- Healthcare
- *Increase speed limits
- *Infrastructure improvement required for further developments; Education funding for K-12; Concentration of family wage jobs
- *Plans for public transit between Vancouver and Portland. Improve; Homeless children given a place for school; Traffic on freeway, Clark County, especially
- *Prison reform; Education fully funded; Focus more on environmental issues; Government accountability/transparency
- *Public transportation; More activities (ex: zoo big attractions); Bike lanes
- *Traffic; Housing; Meth problem (in Vancouver); I would like to see some of the issues with traffic improved. The bridges into Oregon are too congested.
- *Traffic; Quality of roads

Why is this the most important issue to you? How would you like state leaders to address it?

Tri-Cities

- [Agriculture] Work in agriculture industry as well as many friends and family. Ensure that there is adequate farmland, keep development at bay. Offer programs that keep ag land competitive with development land.
- [Cleanup at Hanford] I feel the entire area has/is in danger due to the state of Hanford. Thyroid cancer, MS
- [Education] Trying to continue on with my education is impossible at times. I want my son to be able to go to school.

- [Fishing—warm water and walleye, not salmon or trout] Recognize the value of the fishery. Manage to keep the world-class fishery for walleye that we have. Don't just worry about trout and steelhead.
- [Healthcare] Medicare for all, like California; Helps level the playing field.
- [Justice system] I believe the justice system is making it illegal to lie/alternate stores/cases. But will do themselves.
- [King County not being the deciding factor for eastern Washington or all of Washington total] It affects all of us!
- [Make a balanced budget that works for everyone. Cut out a lot of the fluff; Don't allow pot stores near schools or parks] Go through all expenses line by line and eliminate stuff that we don't need or is not beneficial for everyone.
- [School curriculum] Curriculum has been very slow to advance. We should invest in our youth as they are the leaders of tomorrow. Some schools have curriculum from the 1990s. That is too old!
- [Transportation/roads—fix] I travel around the state a lot— would like travel to be easy/safe as possible.

Spokane

- [Care of homeless] Many of our homeless are there by choice, not wishing to comply with rules associated with certain types of assistance —many have mental health issues which are unaddressed—homeless housing.
- [Education reform] Better pay for educators.
- [Guaranteed maternity leave] Because I intend to start my family soon and leave to start life with children is important for bonding etc. Make some sort of guarantee plan in place.
- [Housing availability] largest and most scarce expense; Public works projects
- [Less invasive tax of business] Growth of jobs
- [More representation for Eastern Washington] I feel like with gas or transportation tax money Western Washington gets most of it. Spokane and areas have street/infrastructure issues.
- [Stricter punishments for animal abuse] Because animals need to be protected
- [The treatment of people of color when it comes to law enforcement] There is always something in the news about the mistreatment of people of color by officers. Some by people that I know.
- [Too many liberals on west side so our votes don't matter] Unfortunately, it is what it is. The only option would be to move to a less liberal state.
- [Transportation] There are several aspects to this: (1) congestion, (2) infrastructure needing repair, (3) coal and oil trains through metro areas, (4) public transportation improvement.

Bellingham

- [Addressing the homeless/jobs] Homeless situation contributed to the decline of the local businesses in the downtown area. We have services, but it seems like jobs? Mental health services?
- [Affordability—cost of living] Because I am an educated professional that can barely get ahead. I don't know how they can address it.
- [Education] All other issues/problems can be more easily worked on with a well-educated population; Funding, etc.
- [Housing] Prices and space are ridiculous in Washington. Spaces are priced too high for anyone to be able to afford something. I'm not really sure how they could fix it — but lots of ways.

- [I-5 corridor through Seattle Metro Area] It impacts my ability to travel to see family or do business. I would like to see improvements to the infrastructure and perhaps a through-lane
- [Incentives for sustainable organizations] Sustainability encompasses all aspects of society. I don't know how state leaders can address this issue.
- [Land use restrictions] Living in a rural setting and being restricted as to what/when we can build on farmland—state leaders need to visit family farms and understand they can't stay farms forever.
- [Land use rights] More emphasis on owner rights, but with significant effort to encourage farming and ranching.
- [Thru-trails for non-motorized] Ability for non-motorized (cycles, predominantly) to travel through urban and rural areas for recreation and basic transportation will help contribute to greater quality of life and reduced emissions—hence, helping the climate issue.

Seattle

- [Education] Education is the foundation of a society. It is the way we can address all the other issues.
- [Fix congestion/traffic] Lower the commuter lanes to 2 people with lower costs since lanes are already paid for.
- [Gun violence] We need our children to become productive members of society. Gun buyback programs (no questions asked), perhaps in conjunction with productivity programs.
- [Homelessness] Homelessness affects not only the homeless but others as well. Also trickles down to healthcare.
- [Less traffic and road construction] I'd like state leaders to get rid of toll roads.
- [Roads/freeways] Roads and freeways are too congested. Some roads do not have same speed limit.
- [No star] No response

Vancouver

- [Dental care availability] Dental coverage/care impacts every area of a person's life! I would like to see the utilization of dental therapists.
- [Healthcare] I have a relative on Medicaid who would not survive without medical coverage. I wonder how many people have no health insurance due to affordability.
- [Increase speed limits] Moved from an area that operated at a faster pace. Wouldn't necessarily want this addressed to state leaders.
- [Infrastructure improvement required for further developments] Traffic nightmares
- [Plans for public transit between Vancouver and Portland. Improve] Very carefully, dates for trail or implementation
- [Prison reform] There are too many people in our prisons who have needs that are not being addressed.
- [Public transportation] Because we should have longer/earlier bus hours, and more places they go. It would be great if we had a tram from Vancouver to Portland
- [Traffic] Commuting; Traveling; Need more access to Interstate and alternate routes
- [Traffic] The traffic affects my time and money and work opportunities.

Appendix D. Written Exercise 2

Thinking about roads and transportation issues, what are the most important things that need to be addressed in Washington?

Tri-Cities

- Congestion in the Seattle area; Winter road damage; Smoother traffic flow
- Get trucks off the freeway as much as possible. Money spent to properly maintain bridges.
- Keep up on repaving; Stoplights; More lanes in urban areas; Slower speed limits in neighborhood; More public transportation
- Public transportation; Potholes; Road conditions after winter weather; Have sidewalks
- Safety of bridges/infrastructure upkeep; Better public transportation; Bike lanes; Sidewalks
- Salary/payments of workers; Important areas/main areas needing repairs.
- Spending state funding on roads that actually need repair instead of roads that get repaired to spend the budget; Gas prices
- The roads in Eastern Washington are not kept up as well as Western Washington or North part of Washington; Don't like the roundabouts.
- The roads in TriCities are not bad, but the entire Spokane area needs repair. In town and city streets are the worst.
- There are a lot of roads that you can barely drive on because of the potholes. There are also places that some roads are falling apart.

Spokane

- Actually, same as WE1 [*“Too many liberals on west side so our votes don't matter; Road conditions in Spokane; Traffic in Seattle”*]. The problem in Seattle is with all the bridges. There are no real viable alternatives for where to drive.
- Better maintenance program; Bridge upkeep and repair
- Condition of pavement after winter; De-icing and snow removal; Continued building of swales; Freeway congestion
- Congestion; Infrastructure crumbling; Public transportation improvement; Coal and oil trains through metro areas
- I don't personally have transportation issues here.
- More public transportation—buses and light rail; Update of bridges/freeways
- Quality of roads in winter; Speed of road construction—faster work time
- Road improvement; Expansion of highways
- The fixing of potholes on a much faster timeline; Doing away with some of these huge one-way streets; Quicker service in snow plowing on residential streets
- Train reliability (always late); Bus route design and extended hours; Road safety (bike lanes and potholes); Eco-friendly options?

Bellingham

- Better control of traffic and road upkeep in some areas; Bridge/road safety; Dumb drivers; Nature overpasses for animals; Too many cars! Carpool!; Other reasons (transportation system); Parking lots/not changing the roads with housing
- Better traffic flow in large cities (Seattle, for example) and safety of roads, bridges, etc.

- I-5 corridor in Seattle/Tacoma/JBLM/Olympia Too many places where an on-ramp turns into an exit.
- Infrastructure—bridge collapsed; Road repair; Snow removal/efficient; Use of resources for energy alternative
- Infrastructure—bridges, pavement, availability; alternative methods that do NOT involve one person/one car; Congestion
- Public transportation—high speed train across the state. East-West, North-South and otherwise, especially the I-90 corridor. AND for trains to accommodate cyclists, have good regular schedules.
- Safe bridges and overpasses; High volume of traffic in metropolitan area.
- Transportation problems on I-5 from Seattle. Massive traffic both ways from 7am to 8pm daily.
- Urban housing plans and sprawl; Proper planning of housing developments and more mass transit options.

Seattle

- Congestion; Potholes; Toll prices; Light rail
- Carpooling—more bus (transit) availability; Trains/light rail (more) across the state
- Already covered these concerns on page 1 [*Fix congestion/traffic; Lower the commuter lanes to 2 people with lower costs since lanes are already paid for.*]
- Too many roads and congested and backed up. The speed limits should make sense. One neighborhood 20 mph, next on 35 mph. What is up with that??
- Road improvement; Expansion of public transportation
- They keep building more houses, but do nothing about improving the roads. I think taking the bus is too complicated.
- Traffic congestion in Puget Sound; Quality of bridges and highways

Vancouver

- Better access east and west; Better public transit; Quicker north
- Congestion on the highway, but I don't think anything can be done.
- New roads or improved arterials keeping up with new development
- Road improvements and parkways with fewer lights and more overpasses
- Safer, more environmentally friendly transportation systems
- Speed limits are set too low; Clarify street signs—I just moved here and find the signs unclear
- Traffic congestion is pretty bad along the I-5. Getting into Seattle or across the river to Oregon is really bad.
- Travel ability—road conditions and traffic
- Wider lanes, bigger bridges, possibly create a Max commute to Portland (Cheaper cost, too)

What about in your area?

Tri-Cities

- Bridge from Rd 68 to Edison
- Duportail Bridge to Queensgate area will relieve *a lot* of traffic congestion. Make roundabouts—easier.
- Incentives to use public transportation and car pools

- Potholes are not as bad. Our transportation is getting updated, but we have limited hours of running buses, than other places.
- Public transportation can be expensive. I know that you can get reduced tickets, but if you don't have money to ride the bus, you walk.
- Public transportation options to Hanford area. Train or light rail? Not big route needed, as most population works out there; Slower speed limits near houses.
- Road coming from Prosser to here has the same "bump" signs that they had 30 years ago when I moved here.
- Road control. Needs to be addressed because we have more freedom for pedestrians than drivers. Making it hard to commute on time.
- Same as above [*"Spending state funding on roads that actually need repair instead of roads that get repaired to spend the budget; Gas prices"*]
- There is a lot of "patch" repair here. Several areas, (Steptoe and Keene area) that need to be addressed. Too congested.

Spokane

- Bus route and design to reach farther in to suburban areas and extend hours so night and swing shifters can still ride.
- Development without infrastructure improvement to meet increased congestion; Fix dilapidated infrastructure (potholes, bridges, etc.); Improve public transport
- Freeway congestion in particular areas; Drivers education; De-icing chemicals contribute to poor water quality
- Potholes in city of Spokane
- Potholes—quality of roads; Better materials so roads don't fall apart in winter; Snow plowing more often
- Potholes; Better light signals
- Potholes; Bus routes
- Road improvement; Better road planning
- The repair of potholes in my area
- We have a HUGE pothole problem We seem unable to patch the holes in a timely manner. By the time they are all fixed, it's winter and we start all over.

Bellingham

- Alternative methods that do NOT involve one person, one car
- Controlling population density and thinking ahead for planning.
- Guide Meridian at Telegraph; Guide at Cornwall Park
- Likewise, better train (or bus) transportation to more people off the highways and roads. Better meaning, more regular and frequent.
- Mass transit to accommodate growth; Safer merging lanes on the interstate.
- Need public transportation available in county, not just city. People living on farms.
- People need to fill in holes, upkeep!
- Repair of roads and bridges; Flow of traffic/timed lights; Trails/room on road for bicyclists
- Road conditions; Traffic flow; Equality of focus on safety of all (cars, bikes, pedestrians)

Seattle

- Congestion; Parking prices are expensive; Better transit
- Carpooling. Bus fare decreased or some incentive for people to ride the bus if they buy a yearly pass (major reductions).
- 522 to 405 is a nightmare. Every morning the commuter lanes add into 405 too far south.
- Some roads need expanding to let more cars travel them.
- The same [*Road improvement; Expansion of public transportation*]
- I'd like better public transportation in Snohomish (county)
- Public transit and road upgrades; Moving people efficiently from north to sound, as well as across the lake.

Vancouver

- Both (3) [Better access east and west; Better public transit; Quicker north]
- Congestion to get downtown; Lack of adequate funding for cleaner streets
- I-5 crossing—Interstate Bridge First!
- More focus on distracted drivers
- More options!
- Portland traffic—getting to the city.
- Road conditions
- School zone safety! The reduced speed limit begins after kids have already started eating breakfast.
- Too many traffic areas with heavy traffic in the afternoon.

Appendix E. Written Exercise 3

How are road and highways, and maintenance of those systems, funded in Washington? List all the different sources you are aware of.

Tri-Cities

- Each county/cities are budgeting differently. Some wealthy areas fund together a separate bill of repairs for repairs in the future.
- Gas tax; Sales tax?; Car tabs
- Gas taxes, corporate taxes, some federal sources for interstates
- State budgets—how?? Lottery? City budgets??
- Taxes; Grants; Bonds; Private; Levels
- Taxes; Sales tax; Gas tax; Property tax
- Taxes; vehicles tabs
- Taxes: tabs, gas, sales
- The state budget; Gas tax; \$20 license plate add-on
- Tolls; Property taxes; Gas/oil taxes; LIDs; Sales Tax

Spokane

- Car tabs, federal grants
- Gas tax; Federal funding; License fees
- Gas tax; Sales tax
- Gas tax; Tabs (vehicle registration)
- Gas taxes; License fees—special; Property tax (local); Tolls—west side
- Gas taxes; Sometimes developers; PUDs
- Grants?; Tabs; Taxes
- I don't know besides taxes
- M&O taxes; Sales tax; Special levies; Line items in budget
- Taxpayers; The government budget

Bellingham

- Federal and state taxes; Lottery?
- Gas tax; Car tabs; Some other sort of revenue??
- Gas tax; Licensing and registration; Vehicle sales; General sales tax
- I'm not really sure, taxpayers? The state? But they get their money from us?
- Just a guess. Gas tax; Property tax, etc.; Depends on what type of road—Interstate, Washington Highway
- Sales tax; Gas tax; Cargo weight; Property tax
- State taxes; Local taxes; Federal grants, etc. (taxes)
- Taxes on gasoline? I am not entirely sure, but definitely taxes. Licenses
- Taxes? Grants? Car tabs?

Seattle

- Gas tax; Sales tax; Lottery; Fees; Federal government
- Taxes; Tolls; Good to Go! Pass
- Taxes; Levies and bonds
- Gas tax; Property tax?; Sales tax?; B&O tax?
- Taxes—state and local; Property taxes?
- Our tax money; drivers license fees; traffic tickets
- Tolls; Taxes; DOL fees

Vancouver

- Gas tax; General fund; Construction tax
- Gas tax; Sales tax; Car registration
- Gas taxes; taxes
- Gas taxes; Vehicle license fees; Property taxes
- I am not sure
- I would assume they are funded through taxes, and/or government
- Taxes; Tolls; Tickets
- Taxes? Not sure which ones specifically; Vehicle licensing
- Voter referendum; Taxes, county; City taxes; Licenses and impri nt fees

Is funding for roads and highways increasing, staying the same, or decreasing?

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver	Total
Increasing	5	4	4	5	5	23
Staying the same	1	1	1	--	1	4
Decreasing	2	1	1	--	1	5
Other	--	1	--	1	--	2
Don't know	2	3	3	1	2	11

Comments

Tri-Cities

- [Increasing] \$20 license plate add on.
- [Increasing] Gas tax goes up; Car tabs go up.
- [Increasing] I believe increasing. Taxes are higher and seeing the road work being done.
- [Increasing] Increasing in some areas, mostly staying the same. More tolls in Western Washington, not so many here.
- [Increasing] Tabs go up. Taxes go up.
- [Staying the same] Taxes are going up, but not necessarily enough to cover increased costs — staying the same. Why? We don't always see results.
- [Decreasing] Increasing, but decreasing as a percentage of the budget. Why? Corporate tax cuts: Boeing, Microsoft, Amazon, Starbucks
- [Decreasing] Not following the economy curve = decreasing ÷ staying. I don't know. Prices of things are costing more, but budgets seem to not change much.
- [Don't know] Gas tax—higher?
- [Don't know] Hard to say with the fact that they are separated out in each area.

Spokane

- [Increasing] Funding increasing in overall dollars but likely decreasing per number of cars and drivers.
- [Increasing] Higher gas tax etc.! But is it being used in the most efficient way.
- [Increasing] Higher licensing fees, higher gas tax
- [Increasing] I would assume increasing, but the market price of the work is increasing faster.
- [Staying the same] I don't know but probably saying the same since we seem to have less money to spend but maybe it's just we have more roads to divide money between.
- [Decreasing] Remember hearing on the news that the city was over budget in repair money.
- [Other] Increasing per gallon; Decreasing by miles per gallon by cars
- [Don't know] I haven't watched those numbers. When I was younger the places I lived in Washington seemed more likely to vote for taxes paying for road maintenance.
- [Don't know] No comment
- [Don't know] No idea

Bellingham

- [Increasing] I'm guessing it's increasing to maintain population density, but don't know
- [Increasing] Only way to maintain our aging roads that see more and more use is to increase maintenance.
- [Increasing] Probably increasing, but enough to keep up needs. Why? Conflating needs for tax money.
- [Increasing] Taxes get higher. It's like death, a sure thing.
- [Staying the same] Focus is on large projects, so funding may increase, but that just means more projects or bigger ones.
- [Decreasing] I'd guess its decreasing relative to the population growth, but I don't know why. Just assuming because revenue for road improvements is in the news more and more.
- [Don't know] I don't know, but it's probably increasing—so where's our money going?
- [Don't know] No idea
- [Don't know] Not sure

Seattle

- [Increasing] Increasing in Seattle—cost of digging the tunnel
- [Increasing] Inflation
- [Increasing] Taxes have gone up but roads have not improved.
- [Increasing] the cost of living always keeps going up.
- [Increasing] Toll prices are increasing.
- [Other] It should be increasing when gas is more expensive. Saying the same or decreasing when gas price is down.
- [Don't know] Have not been here long enough to make a decision.

Vancouver

- [Increasing] Because with more people moving to the area there are more funds being used.
- [Increasing] I would have to guess it's increasing due to more people. Should equal more tax dollars.
- [Increasing] Increasing—gas and property tax

- [Increasing] Increasing, but I don't actually know, I just see some improvements.
- [Increasing] More work on streets and highways and increase exits and entrances to freeways
- [Staying the same] No comment
- [Decreasing] Cheaper fuel costs and more efficient mileage or alternative fuel vehicles.
- [Don't know] Not sure
- [Don't know] Student/mom brain :)

Appendix F. Written Exercise 4

What guiding principles should state leaders consider when developing policies to fund transportation

Tri-Cities

- Assess need, assess timeline, assess money needed, tax/budget enough to cover it. Make sure we are staying ahead and not falling behind.
- Does it really need done? Are there other areas of need greater? Life safety.
- I think a specific fund shouldn't be separate. All funds for Washington State should be together.
- Impact on everyone; Actual budget
- Needs of all communities
- Population; Public transportation vs. commuters; Where the main sources of jobs are located.
- Safety; Access; Population size
- The committee that they live in, or that will be affected by it, or by the people who will be affected.
- Those who use it the most—or who make a profit by using state highways—should pay the most.
- What the people in the area want. What is best for the area. Budget for project.

Spokane

- Areas not served currently by public transportation; Seasonal effects and conditions vs. safety; enforcement of approved traction device usage period
- Funding should be driven by region. Taxes collected on this side of the state should be used for improvements here.
- I don't feel qualified to address this.
- Is it going to help the big picture congestion? Worth it? Is it going to affect the average person's budget too much?
- Long-term solutions; Cost vs. benefit; Equitable disbursement to different areas of the state; fix the bridges/roads that have deteriorated the most
- Look at the census in how many people use public transportation, buses and trains.
- Traffic in that area; Previous costs to maintain roads; Congestion; Cost of tabs
- What is the best way to effectively move people and products on the public roadways.
- Who is mainly using the road (local vs. statewide like I-90); What roads have most impact on flow and level of traffic
- No response

Bellingham

- Cost vs. Value; Best practice; Sustainability
- Costs and where funds come from, who uses transit the most. Disruption to current transportation or roads.
- Everyone benefits from road and transportation whether they use it or not.
- I don't know?
- Moving toward mass public transit in order to retire use of cars and decrease carbon emissions. How to support efficient and carbon-less auto use, or non-use while somehow getting revenue. Return the higher car tab money for newer cars, higher carbon-use cars.
- Population density; Growth rate; Recent building; How many people use the roads/buses; Flow of traffic safety; Tax—property? Reward for using lighter impact

- The more you use it, the more you pay; Reward people that drive smaller, eco-friendly vehicles.
- Users pay; All benefit so all should pay.
- Where is the demand/growth?; Expense; How it will benefit the state/community, and perhaps who it will benefit.

Seattle

- What do the voters want?
- The median income of the population; Our state budget weighed against other necessities
- The principals of honesty—use the money collected for exactly what it was proposed for, not to line some person’s pockets.
- Use the money they get more wisely; Gas tax for roads; Don’t rob Peter to pay Paul; Use tax; No tolls
- The amount of growth expected for a particular area; Who will be affected most by construction
- I think they should use the money that they take from taxes for what they say they’re going to use it for—no mismanaging money (taxes)
- Use; Safety; Economics (moving freight); Population (focus on larger metros)

Vancouver

- ?
- Current taxes; Comparative states; Growth; Environment
- Don’t cut from necessary programs that benefit the community such as education systems.
- Focus more on user-type fees, funding for mass transit.
- Funding should be divided exactly to county projects that are important to growth and transformation. Contractors and building
- Guiding principles: The population and the anticipated growth and development in the current area; Fund: Average income of most working-class workers
- Is the portion of those benefiting from transit resources paying the most, or the best fair share?
- Personal incomes due to taxes and increases
- Reduction in congestion; Reducing the impact on the environment; Cost benefit analysis; How many jobs will be created?

Who should pay for road maintenance? // What about new roads?

Tri-Cities

- City = city roads; State = Highways/freeways; Cities/Communities should fund their new roads. Maintenance and new roads.
- Counties should pay for their own maintenance. The state, if Interstate. The county is local.
- Everyone and every business
- Everyone—traffic fines, etc.
- Everyone. Maybe proportionally more for those who drive/use it more. Incentive for people to use public transport.
- Everyone. Roads for new development should be paid for in part by developers.
- I believe any/every registered owner of a vehicle (current) should be able to see a deduction in registering a car in Washington.
- Maintenance—Washington State residents // New roads: same.

- New: state; Counties: main (combination)
- Trucks—they do the most damage // Who will benefit from them?

Spokane

- 50/50 state and public // State
- All people // Those that benefit the most—developers should play a significant role; All people should play a smaller role
- All users, heavy use/commercial=higher percentage, out of state visitor/tourist through sales/other tax // % of taxes statewide, % from municipality benefitting most
- Citizen taxes and/or city budget // Government
- Citizens who use roads // New roads for local developments, the developers through fees on property sold and generally cities how use roads.
- Everyone—even people who ride buses use the road // Drivers can pay a bit more in gas tax/tab costs
- Some of our taxes and our city funding budget // Some of our taxes and our city funding budget
- Taxes—community members taxes need to be for that purpose // Grants—state allowance
- The city/state by means of taxes. Should plan/pay for road maintenance and new roads.
- The state should pay for road maintenance, as well as local government with tax money // New roads should be at least partly paid by developers—Regal corridor for examples.

Bellingham

- >50% by already present folks // 50% by those who will be moving in to use. Depends on type of road: Interstate, Washington Highway, city streets.
- All citizens through taxes // Developers
- All taxpayers // All taxpayers
- Everyone should pitch in; Who uses the roads the most? // Semi companies should pay, NOT the driver
- Taxpayers; People who use the roads in part; State // Taxpayers; State-funded from federal
- The folks that partake in the use of said roads should help fund maintenance and new roads.
- The people who use the roads the most. So a per-mile tax in addition to a basic tax on fuel?
- Those that use them, commercial traffic should pay more; heavier vehicles // the communities they serve.
- Those who use them the most, i.e. tolls. New roads—everyone (taxes)

Seattle

- Everyone that lives here in Washington.
- I think that instead of using all this money for their political campaign they should use it for roads.
- Money from state road fund // State, county, and city—individually or possibly combined depending on where the road is.
- Taxpayers
- Taxpayers—need transportation // Same—split up the funds. Reserves (if any)
- The state // Business owners who tend to make money from new roads.
- Users statewide // Users in that area

Vancouver

- All should pay, but heavy vehicles and/or high-density travel pay a bit more.
- City budget (both)
- Counties/cities (taxes) // State (taxes)
- Department of Transportation // Companies building new roads for access
- Drivers via taxes
- Governments // Taxes
- People who use roads statewide for both
- State government department of Transportation; Contractors who build new subdivisions; County taxes
- State Highway: Others; City Streets: city // Highway: state; City streets: Cities

Appendix G. Written Exercise 5

The Washington fuel tax is 49 cents per gallon and is the primary funding source for our roads. Motorists are switching to more fuel-efficient vehicles, which means the amount of fuel it takes to drive a mile is dropping. This is projected to cause a decrease in the funds available to repair and maintain our roads or build new roads.

The State of Washington has considered changes to the way transportation is funded in the state that reduces reliance on the gas tax. It is researching many ideas, one of which is a “road usage charge,” which is a system where all drivers pay to maintain roads based on the miles they drive, rather than how much gas their vehicle uses.

What is your first impression of a road usage charge?

Positive impressions	
Tri-Cities	<ul style="list-style-type: none"> Overall a good idea, some questions below. Need to balance with gas tax because I like the incentives to carpool and get more fuel-efficient cars. Fairer if it takes into account the wear and tear of the load hauled. I personally <i>like</i> it. You don't want to pay for something you're not using. In theory, I think it sounds like a good, fair idea.
Spokane	<ul style="list-style-type: none"> Better system because it would focus more on your local roads and not the ones that you don't use. First impression is that it sounds ideal/fair except the feasibility of it is not realistic at first glance. I like the idea but who's to say that the person will be honest in their reporting how much they truly pay. It sounds good in theory. Logical—the number of miles driven and the impact of the vehicle type on the road surface are important factors in cost of maintenance.
Bellingham	<ul style="list-style-type: none"> I agree I think it is a step in the right direction. Makes sense as long as it is really appropriate to the user. I would likely cycle to work more often to avoid charge. My first impression is that it sounds more fair. Gas usage doesn't make sense for primary funding. My first impression is, “damn, I'd spend a lot.” But it makes sense. People will bike more! Makes sense to switch given the need; People with short commute; Disincentive for people to use hybrid vehicles? Sounds good to me, but is it a sustainable model for the long term?
Seattle	<ul style="list-style-type: none"> There could be a charge for electric vehicles too. Not all vehicles use gas, so I think a road usage charge is a good idea.
Vancouver	<ul style="list-style-type: none"> Interesting idea. Seems to make sense, but I have questions. Would be fair.
Neutral impressions	
Tri-Cities	<ul style="list-style-type: none"> Depending how many miles per year driven
Spokane	<ul style="list-style-type: none"> Could be an okay idea, how will it be implemented? I could see it as another source of tax dollars in conjunction with the gas tax.

	<ul style="list-style-type: none"> It would depend on how much the charge is. It's feasible. I don't drive much so it wouldn't impact me as much.
Bellingham	<ul style="list-style-type: none"> Possibly good idea—not certain.
Seattle	<ul style="list-style-type: none"> That would be something I'd have to think about for a while.
Vancouver	<ul style="list-style-type: none"> It seems the exact same results as the gas tax, more or less Toll fees instead of proper use of funding

Negative impressions	
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Tri-Cities	<ul style="list-style-type: none"> Highly disagree. The public roads in city limits don't get/need maintenance as much as highways/freeways, which are used more by bigger company vehicles. Something to think about, but doubt it's the answer I believe that the cost to maintain this outweighs the loss of revenue that is lost. Terrible
Spokane & Bellingham	[No responses]
Seattle	<ul style="list-style-type: none"> Unfair Don't like it? Would they still keep the 49 cents per gallon for roads and add a "Road usage charge?" That would not be fair. Unfair/too diverse, not enough consistency. Should be straightforward. Absolutely not! Some people commute for their jobs.
Vancouver	<ul style="list-style-type: none"> Not fair to low-income families Unfair and unnecessary

Skeptical impressions	
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Tri-Cities	<ul style="list-style-type: none"> Seems fair at first. But does not address higher fees for heavier/more damaging vehicles, and does not account for full benefits users derive from road usage
Spokane	<ul style="list-style-type: none"> Weight would be a concern. Passengers? Hauling? What about out-of-state miles? What system will track miles that is not invasive of privacy? How to bill—monthly, yearly, etc.?
Bellingham	<ul style="list-style-type: none"> Will it replace the gas tax? i.e. gas tax is eliminated.
Seattle	<ul style="list-style-type: none"> Good idea, impractical to enforce
Vancouver	<ul style="list-style-type: none"> OMG—How would they determine that and when would it be paid? Unsure of how practical What is the formula used to develop this tax and increases?

What questions do you have about a road usage charge?

Tri-Cities

- [Positive] Do we know the way it will be monitored? How much will it be? Will it be \$/mile, or what?
- [Positive] How do you enforce or track the usage? How is it paid/collected?
- [Positive] How to keep people honest about it? Do we have to take car in to record mileage? Can't do it on calculated miles to work because you might carpool, or drive less depending on the time of year.
- [Positive] How would road usage be monitored? Who would monitor? Are private citizens, businesses and corporate America all equal?

- [Neutral] The smaller business owners who drive more than others, but won't really make money to cover it.
- [Negative] At what rate? Rural areas the same? How will it be monitored?
- [Negative] How will they do this that guarantees equality?
- [Negative] If drivers are being charged just to commute, do big vehicle drivers get the same, less, or more charges.
- [Negative] Impedes innovation. Unfairly punishes workers who can't afford to live near where they work.
- [Skeptical] See above [*“Seems fair at first. But does not address higher fees for heavier/more damaging vehicles, and does not account for full benefits users derive from road usage.”*] How does it account for weight of vehicle?

Spokane

- [Positive] How can the state truly know if the driver is reporting his yearly mileage truthfully to pay less of a road usage charge?
- [Positive] How is this implemented?
- [Positive] How would the funds be delegated?
- [Positive] How would you tally how much people drive? How to keep people honest? What about people that have multiple car changes through the year and multiple drivers in household, kids, etc.
- [Positive] Will there be a simultaneous reduction in gas tax? How will this be reported and paid? Some form of limited state tax? Honor system?
- [Neutral] Does the amount of mileage of person/vehicle drives translate into the amount of impact a vehicle has on the roads it is using? Is a semi-truck the same as a mini?
- [Neutral] How are the miles tracked? Will this encourage people to drive less (bus, trains) and will that still cause a drop in revenue? Will DOT enforce (Have employees check when people come in to renew?)
- [Neutral] How much will it be? How often will it increase? How will they track it?
- [Skeptical] See above [*What about out-of-state miles? What system will track miles that is not invasive of privacy? How to bill—monthly, yearly, etc.?*]
- [Skeptical] When/how is it collected? Will new infrastructure be needed?

Bellingham

- [Positive] But heavy trucks, bigger vehicles, should pay a higher amount, both in the per-mile as well as a weight surcharge. How to calculate? Especially for older vehicles. How to make equal between low-impact, like motorcycles and smaller cars vs. big SUVs or trucks?
- [Positive] Different for different vehicles? Do out-of-state drivers pay? Will other mass transit options be available? Are we paying two taxes then? Will tolls go away?
- [Positive] How is it calculated. And how do you report your usage?
- [Positive] How will this be determined? Honor system? Why not just use tolls? Tier structure based on vehicle weight light-use, commercial, commuter. Why not increase the gas tax?
- [Positive] How would they keep track of our miles? Would we be required to legally track and report them? Meters on the road? Vehicles?
- [Positive] So, same charge for one driver/car vs. someone who carools with more than two people? Is it fair for those who are rural vs. urban?
- [Positive] What mechanism? Tollways work, but cause delays. How to avoid them?

- [Neutral] How will lawmakers influence people’s choices if these are equity?
- [Skeptical] How much does it cost to administer? Would a new bureaucracy be created? When would it be collected?

Seattle

- [Positive] How much would a road usage charge be?
- [Neutral] How would it be figured out to be fair?
- [Negative] Do people that commute for their job get a tax break?
- [Negative] For work, recreation? Do we have a choice? A lot of people would stop driving or set gauge back in their car.
- [Negative] How much? Will it keep rising or have a limit? How do they know how much you drive ?
- [Negative] Who oversees the disbursement of the revenue from these charges?
- [Skeptical] How? How will usage be determined, how will it be billed, how will it be enforced, what are non-compliance penalties?

Vancouver

- [Positive] How would it be determine, measured?
- [Positive] What about public transportation use? How will this be measured? Self-reporting, cameras?; What about those who work longer distances because there aren’t jobs close by?
- [Neutral] How is this monitored? What would it be? Comparable to gas tax?
- [Neutral] What would prevent these charges from being used elsewhere? Mileage vs. Weight; What happens to jobs in trucking? Would jobs be lost due to charge?
- [Negative] How would it be implemented/broken down in fees? How would this be collected/tracked? Would extra equipment be necessary—if so, who pays? Would this be a private company like the toll roads in Southern California?
- [Negative] How would it work to help?
- [Skeptical] How will this funding increase road maintenance in the future?
- [Skeptical] How would they determine that and when would it be paid? How much per mile would you be charging?
- [Skeptical] Same charge per mile on all vehicles or all locations?

Appendix H. Written Exercise 6

Do you believe a road usage charge is a very good idea, good, poor, or very poor idea to fund transportation improvements in the state?

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver	Total
Very good	--	1	1	--	--	2
Good	6	6	3	2	2	19
Poor	1	1	2	2	1	7
Very poor	3	--	1	3	2	9
Don't know	--	2	2	--	4	8

Comments:

Very good; Total n=2	
Spokane	<ul style="list-style-type: none"> One factor not mentioned is out of state/tourist impact. How this is implemented should address ALL drivers.
Bellingham	<ul style="list-style-type: none"> Sure makes it difficult for people who have to live further away from their jobs because of the cost of living where jobs tend to be, so they get dinged for living where they can afford, but have to work further.
Tri-Cities, Seattle, and Vancouver	[No responses]
Good; Total n=19	
Tri-Cities	<ul style="list-style-type: none"> Again, need a good way to monitor mileage and need to keep incentivizing using roads less. How do you figure it to make it fair for all? No breaks for business. I would like more detail before standing firm. It could affect small business owners negatively Step in the right direction, but more details needed. You use it, you pay for it. You get what you pay for.
Spokane	<ul style="list-style-type: none"> Depending on how it would be implemented. Good but doesn't see easily executable. Fair though. I feel there are many variables that would need to be accounted for. I think it might be a good supplement, but not as a total replacement of a gas tax. The combination of the two would be better. Only if each person is honest in reporting their mileage. The people who use the roadways would be responsible for maintaining them.
Bellingham	<ul style="list-style-type: none"> Good, maybe very good, better than having a Washington state income tax. Have not heard details, so unfamiliar with pros and cons. No comment
Seattle	<ul style="list-style-type: none"> No comment No comment
Vancouver	<ul style="list-style-type: none"> I think it would be the fairest way to collect revenue for roads. I would have to see what other states are doing to fund their roads. It seems very similar to the gas tax in the end.

Poor; Total n=7	
Tri-Cities	<ul style="list-style-type: none"> GPS?
Spokane	<ul style="list-style-type: none"> It depends on how much it will cost.
Bellingham	<ul style="list-style-type: none"> I worry about the implementation of the tax; adding another tax burden, more red tape, more burden on drivers. It would be difficult to track each person's usage of the road.
Seattle	<ul style="list-style-type: none"> Drivers shouldn't Some people drive a lot for work. They may have to use their own car. That would not be fair.
Vancouver	<ul style="list-style-type: none"> Some will pay while others won't be able to due to income
Very poor; Total n=9	
Tri-Cities	<ul style="list-style-type: none"> With all the tax, gas, oil changes as is, I believe the companies that deploy big vehicles should take that responsibility. The cost of record keeping is expensive. No way for accuracy. Innovation; Climate change; Reliance on foreign fuel
Spokane	[No responses]
Bellingham	<ul style="list-style-type: none"> Will potentially increase funding for roads/bridges and make our state better. Create a new paradigm for tax.
Seattle	<ul style="list-style-type: none"> Can't enforce it or enact it. See page 5 [Unfair/too diverse, not enough consistency] Unfair for those that commute during their job.
Vancouver	<ul style="list-style-type: none"> If raising the fuel tax does not increase funds for maintenance/build new road after an audit of how funds are used, there is a bigger problem. No comment
Don't know; Total n=8	
Tri-Cities and Seattle	[No responses]
Spokane	<ul style="list-style-type: none"> Depends on implementation, lots of questions on how it will play out. Need details.
Bellingham	<ul style="list-style-type: none"> I'm not sure. It's a decent idea, but I want more info on how they think they're going to track "us" or "miles" and monitor said usage charge first. Would need more details on how it would be implemented.
Vancouver	<ul style="list-style-type: none"> Depends on how it is structured. Is there a basic number of miles/year at no charge (for retirees, etc.)? How will this affect transportation in the next 20 years when auto driving (driverless)? The future of roads impacted. I feel indifferently about it because I would assume you'd have to pay a one-lump sum fee like state taxes for property and that scares me. I need more information about the specifics of this method

Appendix I. Written Exercise 7

There are many different ways to charge drivers for the miles they drive. Three possible ways are described below. Below each, write down any questions you might have about such a method. Put a star (*) next to your preferred method.

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver	Total
Purchase permit	6	2	5	4	5	22
Self-report	2	4	4	1	2	13
Automatically report	1	3	--	2	--	6
No response	1	1	--	--	2	4

Purchase an annual permit

Drivers who choose this method would pay an annual fee for a permit. Permits could be purchased online.

Tri-Cities

- \$/mile or straight fee across the board? How to monitor, how many miles it goes off?
- Cost; How many miles driven; Average cost
- Could this be included into registering a vehicle?
- Could this be sold like tabs?
- Covers all miles? License fee changes? Ends gas tax?
- Fixed? More than one car? Like car tabs, (Hahaha)
- How does this monitor miles driven? What are consequences if no permit?
- How much per mile/how is mileage determined, how are rates set. One size fits all? Consequences?
- People who drive more pay the same as people who don't
- No response

Spokane

- Basis for permit fee.
- Fee structure tiered based on number of miles driven? Penalty reward for over/under purchased miles? How are miles tracked?
- How would it be tracked? Is there a penalty for overages? What if you drive less?
- How would this work? What if you go over your allotted miles?
- Is the permit based on something other than just mileage (like car type) which impacts roads?
- Pre-paid? Good for state, bad for people. "Forever stamps" scam.
- What about people with multiple vehicles or kids? Can the permit be used for various vehicles? Penalty for going over? Tier structure?
- Would there be a tiered pricing structure depending on range of miles driven? What if you go over? Who monitors?
- Would there be different levels? i.e. 0-1000, 2000-3000
- No response

Bellingham

- Are the permits tired or scalable? What about averages? How to police? Rollover minutes?
- Assume high enough tax not encourage everyone to use.
- Based on estimated miles—daily commute? How much is the annual permit? Is there a discount for fuel-efficient vehicles? Transfer with driver?
- How is the cost of the permit determined? Require some sticker, or other such ID?
- How much? How does this equal gas tax?
- How much? Unlimited miles per car?
- If you go more than XX miles, an annual fee would be worth it, but what if you went less? Maybe get some money back at the end of the year? Because they're still not going by miles. A permit. But I'd want it to be very well calculated to know I'm paying a fair amount. How much? Refund? Miles limit? Maybe a different price? Or self-report? But need info. What if someone else uses your car? Town miles vs. Freeway miles?
- Seems least costly/logistical. Costs? How many allowable miles? What if you use more or less than the allowable miles? Different cost for state roads vs. city or county?
- Would the permit cost the same for everyone?

Seattle

- Honestly forecasting miles?
- Would it be similar to tabs/you'd have to renew your permit annually?
- The cost. What the formula would be.
- How much? How would be price compare to using gas?
- How much would it cost? How would the cost be determined?
- Cost—parameters/rules of declaring mileage
- Cost; Is there a mileage limit?

Vancouver

- Depends on miles permitted and permit fee
- How about poor people?
- How equitable would that be? How is fee determined?
- How much would this permit? Is there a certain amount of mileage per permit?
- How much?
- Limitation on miles/cap with the permit
- Mile limits? Different levels? (Standard vs. premium)
- Permit cost/per yearly miles
- What prevents excessive mileage and cost balance

Self-report total miles driven

Drivers would be responsible for periodically reporting the number of miles they drove. They could do this by taking a photo of their odometer with their smartphone, or by having the Department of Licensing record their odometer reading at a local office. Drivers would receive a bill for the miles driven.

Tri-Cities

- DOL could do this each year for tab renewal
- Hard to track honest with smartphone option
- How do we prevent fraud? What if you can't pay the bill?
- How would this be monitored fairly?
- Odometer fraud, out of state miles, out of state workers.
- Out of state cars
- Out of state driving? Pictures not honest. Can be Photoshopped.
- Out of state miles? Out of state drivers? Commercial vehicles?
- Self-reporting is totally a terrible idea. I would be honest.
- Some odometers don't work

Spokane

- Again, multiple vehicles, bring them all at once?
- How would they know the photo is of your car's odometer? Is a mile a mile?
- No response
- What about miles driven outside of WA? How would we charge vehicles driven here from outside the state?
- What about miles driven outside the state?
- What about odometer fraud? How do you know when they took the picture if done themselves?
- What about out-of-state miles? Sounds pretty easy to manipulate.
- Who do you prevent Photoshop/old photos
- Would be more accurate using a log book to track areas of use for interstate and intrastate miles.
- Would there be a disadvantage to lower-income individuals?

Bellingham

- Are all miles equal in impact? What if odometer is broken or inaccurate? (e.g. tire size)
- Big Brother!
- How do you know that is their car? What if I loan my car to someone? What if I drive out of state?
- How much per mile? How does this compare to the gas tax? Who collects the data? And who pays for the system to collect and track data?
- How would I? Why couldn't pay?
- If it takes 30 minutes to do something at the DOL, how could this be done quickly? How to police? Avoid fraud?
- Lots of ways for people to cheat the system. Takes more time, more steps for error.
- People less than XXX miles. How would they really monitor this?
- Who polices this? Is this trustworthy? People might hack/or do work arounds. Local office option could be very costly to run, so defeats the purpose.

Seattle

- Ethical
- How do they monitor the odometer matches the right vehicle? What if you have multiple cars?
- I'm sure there would be a way to cheat this. Not saying I would, but others might.
- Isn't this too unorganized? Should it be a clear system that is the same for everyone?

- It might be easier to pay for if they did this every six month? How much would they charge per mile?
- Penalty? Nightmare of Department of Licensing enforcement?
- This would have lots of people trying to figure out how to make those miles less. Honesty of people—probably lots of fraud.

Vancouver

- Are there discounts if under certain milage ?
- Honesty issues. It would be very easy to cheat. I don't want to be at the DMV for another reason
- How do they determine the miles were driven in Washington?
- How do you know the odometer is mine? (Picture method)
- How often and what if you refused to pay?
- How often? Any exempting? Out-of-state travel?
- How to determine out-of-state miles?
- Impact could cause jobs to be lost. What is to stop it?
- Who will be honest?

Automatically report miles driven using smartphone or in-vehicle technology

Drivers could install a small device in their vehicle that automatically reports the number of miles they drive, or they could use an app on their smartphone to keep track of how many miles they drive. Drivers would receive a bill for miles driven.

Tri-Cities

- “Invasion of privacy”
- Again, don't trust accuracy of a smartphone app.
- Bill how often? GPS? Again, out of state miles?
- GPS? App can just be turned off.
- How would these not be fudged? (Honesty) Out of state drivers?
- I don't believe it would be convenient. Some may forget when and how to start it.
- If this happens, I would stop driving and sell my car.
- Most fair, but most invasive to personal freedoms? Again, what if you can't pay the bill?
- Privacy!!!
- No questions

Spokane

- Certainly feasible. Again, out-of-state miles.
- How is it billed?
- I actually have an in-vehicle device through my insurance company.
- Privacy, would there be protection on that information?
- Same issues as above [*“What about miles driven outside of WA? How would we charge vehicles driven here from outside the state?”*]. Also sounds a little too “Big Brother.”
- States/police authority to use data?
- Tech could solve all of these issues by tracking fuel usage, vehicle impact on road surface, areas of miles traveled inter/intrastate.
- What about older cars? What about miles out of state?

- What if you don't have a smartphone?
- Would this geo track? If so, stop at state line?

Bellingham

- Avoid fraud? How to police? How do you dispute? Hacking?
- Bigger Brother!
- Drive out of state?
- GPS? How does it communicate?
- How much per mile? Who pays for the device and data collection
- How to implement on old cars?
- Not everyone has a smartphone. Another way to make us all puppets and on our phones all the time? Just another way to control us and what we do in our vehicles?
- Small device that tracks you is like Big Brother. Not everyone has a smartphone.
- Who pays for in-vehicle device? Can one use one device across all vehicles? What if smartphone doesn't have service? Cost of two or three devices?

Seattle

- Ethical
- How often? How high could bill get at one billing time? People will forget. I would not like to— maybe too complicated for older person.
- Isn't there room for error? Some people (seniors etc.) may not be able to do that.
- Multiple cars?
- Seems like this infringes on privacy.
- These are available already. Tech challenged...
- What if they refuse? Or don't pay?

Vancouver

- Accuracy? Honesty?
- How invasive would the app/in-vehicle technology be?
- How much? Out of state miles?
- If it can be installed, it can be uninstalled. What prevents it and does it prevent the ability to track it?
- Information protection. Security is already a big issue and this would be worth a fortune.
- Is this a track on location?
- Not all have smartphones. Cost of device?
- Not good for travelers
- Who would pay for device? Does everyone have a smartphone?

Do you have other ideas about how you might like to keep track of the miles you drive?

Tri-Cities

- [No responses]

Spokane

- Cars have a yearly reset on the odometer— so mileage can be calculated.
- It was mentioned earlier—toll roads. This would be simplest, least invasive, keep local.

- Record them when paying for tabs.

Bellingham

- Like new toll system, computer tracking.

Seattle

- GPS tracking device.
- I don't want a new tax. Instead add to a current tax.
- New/used car dealers must install automatic devices in vehicle.
- When tabs are purchased or perhaps at emissions reporting testing—would be every other year.
- Why don't they use the miles driven reported on your taxes?

Vancouver

- Increase fuel tax and tab fees?
- Monthly permit?
- No clue
- None
- Purchase a permit

Appendix J. Written Exercise 8

Below are several reasons some people might support a road usage charge. Rank the reasons from 1 to 4, where 1 is the most compelling reason to support a road usage charge, and 4 is the least compelling reason to support it.

Response Category	Mean Tri-Cities	Mean Spokane	Mean Bellingham	Mean Seattle	Mean Vancouver	Mean Total
Road usage charges ensure each driver pays their fair share based on how much they use the roads.	1.8	2.3	1.7	2.0	1.9	1.9
Electric and hybrid cars pay very little per mile to maintain the roads because they use less gas, but people with inefficient cars pay a lot more per mile because they use more gas. It's only fair that every driver helps pay to maintain our roads	3.2	3.3	2.8	3.4	2.6	3.0
It's not fair that people who can afford new cars and trucks with better gas mileage get to pay less in gas tax, while low-income residents pay more in gas tax if they drive an older, less efficient vehicle. A road usage charge means everyone pays the same for what they use.	2.9	2.8	3.2	2.1	2.8	2.8
Transportation funding is projected to decrease because people are buying less gas due to more fuel-efficient vehicles. A road usage charge would provide a more stable funding stream to maintain our roadways because it is based on road usage, not fuel.	2.1	1.6	2.3	2.4	2.8	2.2

Appendix K. Written Exercise 9

The State of Washington will soon begin a research project on road usage charging. The project will recruit volunteers from all over Washington to test an alternative to the gas tax. Volunteers will select a mileage-reporting method (annual permit, self-report, or use technology), report their mileage for one year, and participate in surveys and focus groups to provide feedback about their experiences. Volunteering in the research project will not cost any money, and volunteers will receive incentives for providing feedback.

Response Category	Tri-Cities	Spokane	Bellingham	Seattle	Vancouver	Total
Very interested	8	9	5	3	4	29
Somewhat interested	1	1	2	3	4	11
Not too interested	--	--	1	--	1	2
Not at all interested	--	--	--	1	--	1
Unsure	1	--	1	--	--	2

What questions do you have about the research project?

Tri-Cities

- [Very interested] Would volunteers select their method?
- [Very interested] Would I be disqualified if I had a sudden car issue? Having to change to public transportation, or even other means of transportation. What if life changes occur that would make forfeiting an option?
- [Very interested] Why have incentive if it is by volunteer? How will the volunteers be monitored? What about out-of-state drivers?
- [Very interested] How would they conduct it? What's the process?
- [Very interested] How would privacy be protected by using tracking devices? How would it be conducted?
- [Very interested] How much time would it take? How would they results be used?
- [Very interested] How much time does it involve?
- [Very interested] How much is the incentive? LOL. Can I try to "defeat" the system to help identity fraud? How do you guarantee a good cross-section of inputs from volunteers?
- [Somewhat interested] Report how often? Time commitment? What are incentives?
- [Unsure] What incentives?

Spokane

- [Very interested] How long is the program; Do you get to choose test method? What is incentive?
- [Very interested] How much time is involved?
- [Very interested] How much time will it take?
- [Very interested] How often meeting? Incentives?
- [Very interested] Would there be restrictions on various things such as # miles projected driving, age of vehicle?
- [Very interested] No comment [x4]
- [Somewhat interested] How often would the focus groups meet?

Bellingham

- [Very interested] How often and how much time would be need to be committed to the research?
- [Very interested] How time consuming will it be to participate?
- [Very interested] No comment
- [Very interested] Tracking per vehicle, or across all vehicles owned? What about rental car use? (In state); Project focus groups, where located.
- [Very interested] Where to I sign up?
- [Somewhat interested] Do I need a smartphone? Am I compensated for the extra time required of me?
- [Somewhat interested] Do we pick the method? Are the groups close, or need to drive?
- [Not too interested] No comment
- [Unsure] No comment

Seattle

- [Very interested] How will my feedback impact overall and truly make a difference? (which would be my goal in helping with the project)
- [Very interested] What are the incentives and what is the length?
- [Very interested] What method would be used? The annual permit, self report, or use technology? How would they choose who participates in this research project? Would I still have to pay gas tax? How involved would I have to be in this project?
- [Somewhat interested] Do we still have to pay the gas tax also? How much time would it take?
- [Somewhat interested] No comment
- [Somewhat interested] When would it start?
- [Not at all interested] No comment

Vancouver

- [Very interested] No comment
- [Very interested] How is reporting conducted?
- [Very interested] How much time would this require daily, weekly, monthly?
- [Very interested] What are the incentives and who would pay and receive the information collected?
- [Somewhat interested] Information security?
- [Somewhat interested] None
- [Somewhat interested] Would you get to choose what method?
- [Somewhat interested] How often report system is required?
- [Not too interested] No comment

Appendix L. Written Exercise 10

List any reasons you may be interested in volunteering for the research project.

Tri-Cities

- A chance to provide input; An opportunity to educate myself about the issue; Providing a service to my community.
- Curiosity; Possible benefits for myself; Insights from others; Knowing what could hit the market before it's just put right out
- Curious about the results
- Desire to participate in the decision process; Curiosity; Incentive
- I enjoy learning and participating in new projects/ideas; I am a "sponge" for new information
- Interested in project; Find ways for improvement; Be kept current/informed
- Know the process
- Learn more about it. Have input.
- Like sharing; Like being involved; Like helping in research; Science background so I believe all research is good no matter what the outcome; Incentive
- To get a better understanding of the process

Spokane

- Better understand options and program.
- Help determine outcome; Can see what works best for me before program goes into place.
- Helping move my community forward; Kickback incentive
- I am slightly against the idea of a road usage fee. So I want to be convinced as to why it might be a good idea and how feasible it might be.
- I like to participate in research projects and be a part of decisions. I like my opinion to matter.
- I think it would be interesting to be part of a solution to the dilemma of transportation funding.
- I would like to participate to understand better how they propose to structure and implement this program; to be aware of the possibilities of the implementation of, restrictions, other specific considerations whether or not this will be imposed or voted on.
- Like to participate in focus groups as long as there is enough incentive.
- So this would help in developing a fair way of deciding on the fee to charge in our [unintelligible] if this becomes a mandatory law.
- Would be interesting to follow this through and discover exactly how much we are driving and what these new structures would look and feel like; It's a good idea and I think once kinks are worked out it will be good for our state; Job satisfaction so to speak. I like the idea of contributing to something more, offer diverse perspective.

Bellingham

- Curious to see how it works; Want to see first-hand benefits/detractors; Like the idea of experiencing a different way for what we do now.
- Generally, I am a curious person; My participation could be valuable to all of us.
- Helping the community; Interested in the process; Improving before rollout

- I find this topic incredibly important for the state of Washington, because the maintenance and development of our roads is critical, as is the development of major transportation options as a result of the new funding.
- None.
- Research is a valuable tool to determine. Feasibility of new systems.
- Sounds interesting and driving is something I am passionate about and pay a lot of attention to.
- To get an insight on how it would be done; See the mile reports and make a logical choice for yourself when you have to pay for it.
- To help in coming up with a new type of fund/revenue stream

Seattle

- Curious to see outcomes
- I already keep track of my mileage for my own business so it would be easier for me to help gather the info than someone who doesn't keep track.
- I am a driver and should be part of the decision-making process.
- I'd be interested because I like to be a part of new changes that are being made in my community; I like to volunteer and give back to my community.
- Incentives; Money for doing it
- Your input could affect the outcome of the study.
- No response

Vancouver

- Curiosity; Participation and understanding of this method; Better understand how I feel/think about it
- Finding new ways to source needed funding and comparisons
- Get an advanced idea of monthly/annual cash flow expense; Curious to see how this idea could work.
- I think it would be interesting to know how much one spends driving and the costs
- I travel Washington State Roads a lot during the spring and summer months; It sounds interesting; I drive a hybrid vehicle
- I would like to see if this is a feasible plan to increase funds to repair roads.
- It could be helpful to work out the kinks and troubleshoot
- My current job involves extensive driving, so I am very interested in seeing how, as a person who drives more than the norm would be affected.
- No response

List any reasons you may not be interested in volunteering.

Tri-Cities

- Amount of time involved; Dates of meetings
- Excessive time commitment.
- If it took too much time
- If possible, could be time consuming
- Liberal state, government is going to do what they want regardless.
- None
- Possibly time consuming

- Time consuming; Worth the payment; Possible personal invasion
- Too much time/hassle
- No response

Spokane

- If it would take too much time or insufficient incentive.
- May not get to choose method.
- None
- Time commitment
- Time constraints depending on how intrusive it is.
- Too much time; Do we get to pick our own tracking reporting method or is it assigned?
- Would need advance notice for meetings due to work constraints, Need to have enough notice to switch shifts at work if necessary, etc.
- No response [x3]

Bellingham

- Difficulty/time consuming.
- How much time outside of my “normal” life will be required for the surveys and focus groups.
- Impacting my lifestyle; Intrusive; Time and effort
- None.
- None.
- Not wanting to spend my free time on a project of this scope.
- Too much effort for something experimental?
- Where it meets, how often, time. How it tracks.
- No response

Seattle

- Don’t have the time with zero incentive to participate—free gas for a year?
- If I have to self-report, I want to ensure I don’t forget.
- Privacy; I feel like I’d be tracked wherever I drove.
- Time consuming? Maybe...Would be compensated?
- Will it take a lot of time? If so I may not have that time. Do you get restrictions put on you when you do this?
- N/A
- None.

Vancouver

- Concern about forgetting (ha ha)
- If my name and address/family members would be disclosed to the wrong people. Confidentiality.
- Information security for digital options. Hassle to report if it is time consuming
- My spouse would be unhappy about personal information given
- Not convenient in tracking and/or reporting
- Takes too much time for my schedule with reporting, compared to compensation
- Time it takes to report and I wouldn’t want to be monitored with a type of device.
- Too much effort
- Too much reporting; Having to attend meetings

Appendix M. Written Exercise 11

Below are several reasons someone might want to volunteer for the road usage charge research project. Rank the reasons from 1 to 6, where 1 is the most compelling reason to volunteer and 6 is the least compelling reason.

As you read each message, circle any words or phrases you like. Cross out any words or phrases you don't like.

Response Category	Mean Tri-Cities	Mean Spokane	Mean Bellingham	Mean Seattle	Mean Vancouver	Mean Total
All participants will receive an incentive in appreciation for their time. The incentives will be timely and easy to redeem	4.2	2.9	3.9	2.3	3.4	3.7
The research project is a unique opportunity for Washington drivers to “test-drive” a road usage charge and share their experiences. Your preferences can help shape future funding policy.	2.1	1.6	1.4	2.9	2.8	1.9
We need people from all across Washington to help us test a road usage charge. The experiences of all types of drivers—urban, suburban, and rural—are important to help guide future funding policy.	2.7	3.7	3.4	3.7	2.7	3.1
The pilot is being sponsored and implemented by the State of Washington.	5.2	6.0	5.3	5.4	5.0	5.4
Volunteers in the research project have flexibility. They will get to choose how to report their miles each month for the duration of the test—an electronic mileage meter, a smartphone app, or the readings from their own odometer	4.2	3.5	3.4	3.4	4.1	3.8
Volunteers in the research project are providing a public service. The feedback from participants in this research project will help shape our state's future.	2.6	3.3	3.4	3.3	2.6	3.0

Words or phrases liked

Tri-Cities

- Incentive; unique opportunity; share their experience; preferences can help shape future funding policy; flexibility; public service
- Participants will receive; preferences can; from all across Washington

Spokane

- “Test-drive”; shape future funding policy; flexibility; shape our state's future
- Incentive; easy to redeem; help shape future funding policy; help guide future funding policy; flexibility; choose; providing a public service; the feedback from participants in this research project will help shape our state's future

- Incentive; for their time; timely; easy to redeem; “test-drive” a road usage charge; your preferences can help shape future funding policy; all types of drivers—urban, suburban, and rural; guide future funding policy; flexibility; choose how to report their miles; providing a public service; shape our state’s future
- Your preferences can help shape future funding policy

Bellingham

- All participants will receive an incentive in appreciation for their time; Your preferences can help shape future funding policy.
- Help shape future funding policy; urban, suburban and rural; sponsored; implemented; by the State of Washington; flexibility; providing a public service.
- Incentive in appreciation for their time
- Unique opportunity; experiences; future funding policy; state’s future

Seattle

- Appreciation; timely; easy to redeem; unique opportunity; “test-drive”; share their experiences; shape future funding policy; we need people from all across Washington to help us; all types of drivers—urban, suburban, and rural; State of Washington; they will get to choose how to report their miles; Volunteers in the research project are providing a public service.
- Incentive; shape future funding policy; need; important; guide; flexibility; providing a public service; shape our state’s future
- Share their experiences; types of drivers; pilot is being sponsored; flexibility; public service

Vancouver

- [No responses]

Words or phrases disliked

Tri-Cities

- Urban, suburban and rural
- No response [x9]

Groups 2, 3 & 5

- No responses

Seattle

- An incentive [comment: “state what it is”]
- Pilot [comment: “what do you mean pilot?”]

Appendix N. Written Exercise 12

What sources of information would you trust to learn more about a road usage charge research project?

Tri-Cities

- A state poll from peers
- Family and friends; Statistics from the Department of Transportation; Truckers
- News; State website; Independent research (nonpartisan)
- Nonpartisan, non-government related person
- Official website; official person explaining details; official written materials
- Peers vs. politician
- Peers; Friends; Family
- State, city, county employees—actual workers; The school doing the research
- The people who actually did [...]
- WSDOT; WSU/UW/CWU; PBS; Independent bipartisan commission

Spokane

- Department of transportation personnel perhaps; People without an agenda other than fairness, equality, and quality of transportation; Perhaps legislators who are wrestling with this
- DOT; Newspaper; Newscast; Public forum
- From customers who have used it. Non-biased, state citizens
- Good question! With the current political climate, it has become very difficult to trust anything you hear or read in the media. For example, I wouldn't trust anything Jay Inslee said.
- Government pamphlets and websites; Local and state leaders
- Independent consulting firm; University-based research team
- Local community members; City planners; Local representatives; Other states that have implemented it
- Someone who would be monitoring the organization who is developing this program.
- The people running the project; State of Washington
- WA DOT—they are the most knowledgeable and most directly involved; Universities

Bellingham

- DOT; State of Washington; Oil companies
- Flyer/report/PSA from state DOT; Washington State Legislature?
- Local news (paper, radio, TV); Washington Government site (DOL/DOT, Sunshine committee); Local reps
- Logical statistics; I'm not sure
- People who have used it; Would be interested in seeing data about where the state is with current sales tax paradigm and how this is going to bring more funding to work and how much. And report independent; Has this been done in other states? To what success?
- *Properly* vetted independent agent; Bipartisan folk from Olympia
- State of Washington—as project sponsor. Governor? Representatives? DOT head. Project facilitator, with backing of Washington.
- Trust state department to inform; Results of project—I want to hear debate—pros/cons, issues I have not considered.

- WSDOT; Local news

Seattle

- DOT
- DOT; State government in charge of planning and maintaining roads
- I like organizations like the Young Turks because they are unbiased and unaffiliated with mainstream media; A notice in the mail—it's legit and office; DOT or DOL; A website
- Notice in mail; Flier/billboards (on this they could have a phone number to call in questions, or call in if interested. Or an address to write into); A pullout of your own in the paper; Department of Transportation or State Planning Department
- Reps from states that already have this or something similar.
- State of Washington officials appointed to comprise this project.
- Wash DOT Q&As

Vancouver

- A state ombudsman or the Secretary of State
- Department of Motor Vehicles
- State government website; Mailer; DMV
- State sponsored website such as Washington Department of Transportation
- The state of Washington; Local government
- Third party; Multiple
- University policy study groups if NOT paid for study
- What formula is used to determine and track project? Data; Research; Past history; How this system has benefited the residents
- Who is in charge of conducting it? Who is our information shared with? Will this be public information?

What sources of information would you not trust to learn more?

Tri-Cities

- Anybody who didn't know anything about how it's done, or only care about the money we pay
- Corporate interests; Lobbying groups
- Hearsay from peers
- Local news channels
- Media
- Politician
- Politicians
- Politicians, state workers
- Politicians; King County; West side
- The news station or newspapers

Spokane

- Facebook; News; Car manufacturers
- I would take anyone's info (besides researchers) with a grain of salt because everyone has their own agendas and biases.

- Mainstream media
- PACs or people with vested interests or agenda
- Politically motivated entities; Standard news sources; Blogs or general internet
- Politicians
- Politicians and people trying to implement it. Government officials
- Politicians; Anyone that could personally gain from the change
- State DMV or other agency
- The people doing this study

Bellingham

- Executive branch of the US Government.
- Facebook; Private for-profit companies
- Manufacturer of devices.
- Mystery independent agent. ?DOT?
- National news; Oil company, third party backed; Renewable resources; Environmental advocates; Anyone from California
- Oil companies, sponsored by Exxon Mobile; Anyone who could benefit other than the state of Washington
- Oil companies; Car makers
- Politicians
- The workers who would directly benefit from the road usage charge; Whoever those “leaders” are; Some random third party

Seattle

- Mainstream media; Trump
- Oil companies/auto industry
- People not associated with the project, but who want to give their opinion
- Politician article in the newspaper
- Politicians
- State government or lobbyists
- The mayor

Vancouver

- Advertisements
- Any groups tied to fuel industries, auto manufacturers, politicians
- Basic search engines/random sites. Certain news outlets.
- Insurance companies
- Media; Local government
- Most everything else
- None, I want to know as much as I can
- No response [x2]

Appendix O. Written Exercise 13

What message or advice would you give leaders in Washington as they research road usage charging to improve roads in the state?

Tri-Cities

- Be honest about how you are researching. Do not use it as a way to keep taxing Washington residents to put the money elsewhere. Try to make it as fool/fudge-proof as possible.
- Be honest; Be accurate; Be fair; Use money for transportation purposes only; Research fully and completely; How to handle tourists/truckers/folks in rural areas; Use company that is in the forefront of the public for accuracy and honesty; Independent company; Don't use 'use it or lose it'; I drive a hybrid because I wanted to help the environment.
- Don't use this just to make new taxes without removing others; Don't use revenue for something else; Don't waste funds on non-essential projects.
- Fix the budget instead of adding more crap. Use the budget's money for its intended purpose
- Focus on people who do or don't use it as often, or more often; Use the funds available in each household as a primary factor.
- How does it fit into the larger picture? How does it make Washington more competitive in the national and global stage? How would it improve the quality of life for all residents of Washington? Is it fair? Does it increase or decrease income inequality?
- I would suggest to think about everybody who it could potentially affect negatively or positively. There are other people.
- Make sure it truly is fair for all state residents. No input from "special interests." Maintain transparency.
- Please be honest/transparent with us about how/why you are spending our tax dollars. Quit "shuffling" money to other areas that we were told was for roads. Be honest!
- To me, the gas tax works, so make sure this is researched and studied thoroughly. Make sure it makes sense and really good sense at that. People hate seeing a new tax, even if it is for the better.

Spokane

- Budgets for creation of new roads, maintenance of current road surfaces, and other expenses should be drawn from regional use instead of a general state fund parceled out inequitably by population density.
- How would the funds be delegated, locally or statewide? How would the costs of implementing the project and maintaining it weight against the moneys gained? Would there be incentives for economically disadvantaged individuals? It should be voted on.
- It needs to be tested on all different community members. All discussed concerns need to be addressed. It needs to remain fair and not based on greed. Both sides of the state need to be treated fairly in terms of disbursement.
- It seems to me that you are on the right track by including volunteers in the testing to make sure whatever option is ultimately chosen is implemented correctly; Charging truckers and other heavier users more makes sense.
- It should be a plan that ensures honesty from drivers; It should not punish lower-income drivers or hybrid/electric drivers unfairly; Get input from all areas of the state
- Keep the public informed; No surprises; Provide regular updates as information is accumulated

- Listen to their constituents; Work towards quality and fairness of our transportation policy; Recognize we have a problem that we have to solve —so be a part of a solution regardless of politics; Don't kick the can down the road for future legislators
- Make sure the funding/details stay transparent to the public. People want facts, not rhetoric.
- Really look at comparable gains from gas tax vs. road usage charge so that the difference in type of payment isn't that much. For instance, relatively same amount of money for average gas user to road user, that way the average person is going to be okay with the new charge and not feel like they are losing.
- To take the time to look at all the data and information turned in to make and implement fair road usage charges across the board. Even looking at the demographics so low-income commuters would be charged fairly. So the charge wouldn't be a burden to them and cause them to use the buses and park their cars.

Bellingham

- Be sure to maintain an incentive for people to buy cars that produce less of a carbon footprint; Use the money to think beyond maintain and thinking ahead to what our state would benefit from decades from now. Solar panel roads? We need long-term answers.
- Don't make the permit out of reach for low-income people as some need to be able to commute more miles. Maybe a different "permit price" that allow different mile ranges; Care fully structure how to track those miles; Make it fair; I kind of think they'd screw low-income people, because I pay my tax in gas.
- If it's implemented, it can't be more of a hassle than the present system; Must be as fair as possible; No Big Brother data collection/data mining. i.e. earn the trust of the public.
- Improve on existing system. Find a solution that has the highest cost vs value —within existing system. Take some of the funds from marijuana tax.
- It's not about fair, fair is a family being able to cross a bridge without it falling down. Fair is the owner/operator of a semi-trailer getting home on time. Fair is the commuter being safe as they head home. Fair is options for everyone to enjoy the beauty and opportunities in the state. Fair is not making everything equal. Fair is a safer, transparent and focused vision for transportation.
- Keep it simple—the more steps involved, the more margin for error. Listen to the people who use the roads. Keep your budget reasonable, hire a few people to make this work, as necessary.
- Make it fair for all involved. If people are charged the same they should receive the same benefits. Likewise, those that use it more should pay more. Keep the money for all transportation needs.
- The transportation issues the state of Washington faces encompasses so much more than roads, I think. Assuming that by replacing the gas tax, which funds public transportation, ferries, roads, bikeways, currently—a new road usage charging program would and should go to improve roads, but our Washington leaders need to think forward, always, to further down the line what our transportation needs are.; Charges to visitors who use roads? RVs, Trailers, hmmm.
- Very complicated new idea. Provide us with pros/cons. Concerned about wasting limited government funds. Important things need attention, so I want to know there is a real benefit and minimal drawbacks.

Seattle

- Please take public opinions and feedback. There needs to be transparency with how money is spent and what changes are made.
- Median income > “actuary tables” on who is already paying for fees —i.e. driving records—high level of traffic/parking tickets. Perhaps a penalty for those folks who may abuse driving privileges.
- Look into alternative road base that allows water to go through it and the roads last longer (like the ones in England) And they don’t puddle, causing hydroplaning during the rainy season. As far as charging people for road usage, find some way to make it fair and valuable so everyone is willing.
- I really don’t like a new tax. But I would like to see the comparison of current system we pay (gas tax) vs. the mileage price I’d have to pay. Depending how much more it is, would depend whether I’d be for or against it. See that the implementation is honest, and money used appropriately.
- I think they should choose one or the other: gas tax or road usage change. Both are too much. Also what charges would bicyclists pay? They use the roads too. There should be break for low -income families.
- Not to leave any stone unturned when considering this. Gather as much information as possible from all sources available.
- Make it simple to implement; make it completely transparent and fair; enforce it strongly, and evenly across the state; get the rate high enough to *eliminate* the gas tax.

Vancouver

- Be proactive in the causes of road usage and destructive and determine the amount it will cost annually. Then, be mindful of the fees and how you develop the program.
- Consider all levels of income; Consider builders and heavy freight trucks; Consider all roads of usage
- Consider the following: City community; Rural community; Poor community; Vehicles/commercial; Implementation
- Do not implement an expense that would be difficult for low-income households to pay in lump sums. Do not mandate GPS-style technology for mileage reporting purposes.
- Don’t bow to partisan pressure or special interests. This issue has to do with PUBLIC infrastructure. Do NOT let our roads and bridges be privatized.
- Is there a better way to improve our current situation? Is there a way to add this road usage charge to our current system to reduce the impact to residents?
- Make it fair, base off employment types and income ratio. Provide flexible payment option and/or incentives to the residents.
- Privacy and equality are important. Transparency re: the process and who’s getting the information is highly important.
- Provide better security for our information if a digital option is available; How much is this going to cost to implement?



A-6

**MODEL PRIVACY POLICY FOR
ROAD USAGE CHARGING**

 **WA RUC**



Model Privacy Policy for Road Usage Charging



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EXECUTIVE SUMMARY

The purpose of this report is to summarize the issue of privacy protection in distance-based road usage charge systems (RUC), explore the major applicable privacy policies and present a model privacy policy for road usage charge systems in the United States.

Background. When a government proposes a public policy initiative that would require the use of personal information and data from a broad expanse of the population, the privacy issue comes to the forefront as a major issue. The idea of collection of a distance-based road usage charge calculated on personal travel data to fund the public road system is just such an initiative.

To obtain the distance-traveled data for an individual vehicle, the owner or lessee of the vehicle must report the required travel data, or in some cases an estimation of such, to a billing entity. The billing entity will apply the reported distance-traveled data to calculate the charge and present the amount to the responsible person (the RUC payer) as an obligation for payment. During the course of assessing the amount owed, various persons and entities related to collection of the distance-based road usage charge will necessarily collect sensitive information and data from responsible persons and their vehicles, including identifiers, financials, mileage totals and travel time and location.

Protection of personal privacy is important to many and some are impassioned about it. In the public survey conducted prior to the launch of the WA RUC pilot in 2017, 20% of respondents identified protection of personal information as the most important issue to them. In the first survey of pilot participants conducted in early 2018, privacy ranked as the top issue, with 83% of respondents characterizing it as “very important” to them.

Legal protections create law-based restrictions or limitations to use of such data for purposes other than collection of the charge. The United States Constitution and state constitutions are not specific about protection of privacy generally and Congress has not enacted a general privacy protection law at the federal level. For any legal certainty about the protection of privacy for a RUC program, state legislatures must enact legislation.

Recommendations. The EU GDPR and the California Consumer Privacy Act offer certain provisions that should improve the protection of personal privacy that Oregon law has in place for RUC. The following provisions should be included in a model privacy policy for Washington’s RUC program.

- **Protection of RUC information from disclosure.** The model privacy policy should protect from disclosure any personal information identifying or nominally related to a RUC payer and should only protect RUC information rather than information not accumulated for the road usage charge system.
- **Responsibility for privacy protection.** The obligation to comply with the model privacy policy falls to whoever holds the information provided there is imposition of adequate oversight.
- **Establishment of specific privacy protections.** The model privacy policy should apply specific requirements, limitations and prohibitions directly related to protection of personal information collected for a road usage charge program and direct service providers and the authorized agency to establish, publish and adhere to an organizational usage and privacy policy available in writing.
- **Exemptions.** The model privacy policy should exempt from the requirement for non-disclosure of personal information persons and entities operating the road usage charge system and facilitating payment to the extent necessary to fulfill their duties. Other exemption should include the RUC payer with regard to his or her own personal information and entities for whom the RUC payer has given express approval to receive specific personal information. A state should consider other exceptions for law enforcement activities with probable cause for use of the personal information.
- **Rights of RUC payer.** A RUC payer should have the right to access, the right to inquire and the right to examine personal information as well as the right to rectify errors or inaccuracies in personal information and the right to erasure of location and metered use data after it is no longer needed following a specified period. Exceptions to erasure may include consent of the RUC payer, retention of anonymized aggregated information used for traffic management and research and monthly summaries of metered use for accounting purposes. At the outset of the engagement, service provider for a road usage charge system should provide road charge payers information of their rights pertaining to personal information and specifically how to exercise them.
- **Exercise of rights.** The specific requirements for responding to a request for exercise of rights—transparency, intelligible, easily accessible, clear and plain

language—should be described in law. A service provider must never refuse a request for exercise of rights.

- **Prohibition from discriminatory behavior.** A model privacy policy should prohibit service providers from engaging in discriminatory behavior against RUC payers for exercising their rights. A service provider may offer a different price to RUC payers for services as long as the price is directly related to the value provided.
- **Security measures.** A model privacy policy should require a service provider to implement security measures to protect personal information to a level appropriate to the risk of disclosure.
- **Breaches.** A model privacy policy should require service providers to provide notice to an authorized agency when a breach happens and provide specific information about the nature of the breach and its likely impact. Service providers should provide notice to RUC payers of any breach where the service provider has not implemented appropriate security measures, has not taken subsequent measures to reduce high risk or has not made an effective public communication about the breach.
- **Designate a personal information officer.** The model privacy policy should require a service provider to designate a personal information officer with the responsibility as contact for RUC payers and to ensure compliance.
- **Certification.** The model privacy policy should require an authorized agency to establish certification mechanisms for service providers to demonstrate compliance with the privacy protection provisions. Certification bodies should issue and renew certifications on the basis of criteria set by the authorizing agency.
- **Remedies.** Each state adopting a road usage charge program should adopt an appropriate assortment of remedies to enable aggrieved RUC payers to seek redress for violation of their rights. Each state should determine the precise nature of the set of remedies and the penalty amounts.
- **Record of access.** The model privacy policy should require a service provider to maintain a record of access to personal information the service provider holds.

1 INTRODUCTION

1.1 Purpose and Context

The purpose of this report is to summarize the issue of privacy protection in distance-based road usage charge (RUC) systems, explore the major applicable privacy policies, and present a model privacy policy for RUC systems in Washington.

The desire for privacy is personal. Privacy expectations vary depending on the individual and the circumstance. Some have no concern for their personal privacy while others demand protection of complete anonymity.

When a government proposes public policy requiring the use of personal information and data from a broad expanse of the population, the privacy issue comes to the forefront as a major issue. The idea of collection of a distance-based RUC calculated on personal travel data to fund the public road system is just such a proposal.

The importance of privacy also depends upon policy applications. For example, while in most cases automobile travel is a personal endeavor with little government involvement other than obedience to traffic laws, commercial trucking is a regulated industry with driving hour limits, rest requirements, and safety rules with drivers familiar with behavior oversight. Privacy expectations under a RUC system will vary accordingly whether the owner of the vehicle is a private citizen versus a commercial trucking company.

1.2 Objectives

The objectives of this paper are as follows:

- ▶ Explain the general public's preferences for a privacy law covering an enacted distance-based RUC.
- ▶ Present and analyze earlier efforts to address privacy in the context of a distance-based RUC.
- ▶ Describe adopted privacy protection policies and law in the context of a distance-based RUC.
- ▶ Analyze recently enacted general privacy laws in the European Union and the State of California for additional advisable polices for inclusion in a model privacy policy.

- ▶ Discuss the key issues pertaining to privacy protection in the context of a distance-based RUC.
- ▶ Present the model privacy policy.

2 BACKGROUND

2.1 What is privacy protection in the context of a RUC program?

A distance-based RUC system is necessarily based on data directly related to measurement of the length of individual vehicle travel during a specific time period. In the United States, the unit of measurement used for this purpose is the mile; in Europe, Australia, New Zealand, Canada and many other parts of the world, the unit of measurement for this purpose is the kilometer.

To obtain the distance-traveled data for an individual vehicle, the person responsible for the vehicle (owner, lessee, or operator) must report the required travel data, or in some cases an estimation of such, to a billing entity. The billing entity will apply the reported distance-traveled data to calculate a fee, tax or charge and present the amount to the responsible person as an obligation for payment.

In assessing the amount owed, various persons and entities related to collection of the distance-based RUC will necessarily collect sensitive information and data from responsible persons and their vehicles. The information and data collected may include identifying information, financial information, distance-traveled totals, travel times, and locations.

The RUC system can protect the processing of sensitive information and data in two ways: technically and legally. Technical protections can reduce or eliminate development or access to some data used in collection of a road usage charge. Legal protections create law-based restrictions or limitations to use of such data for purposes other than collection of the charge and impose fines or other enforcement consequences for violations.

The privacy issue for collection of distance charges was not a major issue while the idea was mere theory. The use of GPS technology in pilot tests, however, raised suspicions¹. Negative public reactions to the first distance charge pilot test revealed that a technology-

¹ Appendix A describes a history of the privacy issue in early RUC investigations.

solution alone would not mollify generally held privacy concerns over use of GPS data². The emphasis shifted away from a technology solution to administrative and legal solutions³.

To this day, public concerns about RUC often center on privacy, including in Washington. In the public survey conducted prior to the launch of the WA RUC pilot in 2017, 20% of respondents identified protection of personal information as the most important issue to them. In the first survey of pilot participants conducted in early 2018, privacy ranked as the top issue, with 83% of respondents characterizing it as “very important” to them.

2.2 Data and information accessed and used in a RUC program

There are nine essential functions for operating a RUC system.

- ▶ Identify the vehicle subject to the program
- ▶ Identify the owner or lessee of the vehicle subject to the program
- ▶ Calculate distance driven during a specific time period
- ▶ Assign distance traveled allotments to various geographic locations, if the program requires it
- ▶ Access the travel data
- ▶ Apply road usage charge rates to the data
- ▶ Present a billing to the payer of the charge
- ▶ Collect payment
- ▶ Enforce payment

To perform each of the essential functions, the system must acquire particular information and data. Among the data accessed and acquired includes the following.

- ▶ Vehicle registration plate number
- ▶ Vehicle identification number (VIN)
- ▶ Name of owner or lessee of the vehicle
- ▶ Access information of owner or lessee of the vehicle (address, email address, telephone number)

² Recent experiments with Blockchain may have begun to change the view of the general public with regard to protection of sensitive data. Application of the decentralized nature of Blockchain to a RUC system, however, is not even in its infancy.

³ For a more thorough discussion of the development of privacy protection in RUC systems and programs, see Appendix C.

- ▶ Distance traveled data, which may include one or more of the following:
 - > Periodic odometer readings
 - > Metered use of data by latitude and longitude or summaries of the same
 - > Travel pattern data
- ▶ Travel data record
- ▶ Billing and payment record
- ▶ Payment information, which may include:
 - > Bank account information
 - > Credit card number
- ▶ Enforcement record

The administrator or service provider for a RUC system will also acquire other personal information merely by participation in the program:

- ▶ RUC account identification number
- ▶ Identification code for the mileage meter installed in the vehicle

All of this information can identify a person and the person's behavior. As such, this information should be considered sensitive and protected as personal information subject to the Model Privacy Policy.

2.3 The legal basis for privacy protection in the United States

The United States does not have any general privacy protection law at the federal level except for an inference in the U.S. Constitution stated in case law of the Supreme Court determined on a case-by-case basis. Residents of a state cannot rely upon Supreme Court case law to understand how information and data obtained during collection of a RUC will be protected. For specificity and assurance of privacy protections in a RUC system, a state legislature or Congress must enact a statute.

Without federal direction on general protection of privacy data and information, policy enactments protecting privacy for road usage charge data must come from the states. According to the National Conference of State Legislatures, only ten states (Alaska, Arizona, California, Florida, Hawaii, Illinois, Louisiana, Montana, South Carolina, Washington) have privacy protection provisions in their state constitutions. These constitutional provisions apply to government action but not necessarily private actions.

For legal certainty about the protection of privacy, state legislatures must enact legislation⁴.

2.4 Recent privacy law enactments

Recently, the California Legislative Assembly enacted the California Consumer Privacy Act which primarily focuses on imposing requirements on businesses and rights to consumers with respect to consumer data rather than restricting or directing the actions of government. The European Union implemented the General Data Protection Regulation (GDPR) earlier this year with the stated purposes of protecting fundamental rights and freedoms of natural persons regarding the processing of their personal data and their right to protection of personal data, and free movement of personal data within the European Union. The comprehensiveness and reach of the EU's GDPR and the California privacy law renders them relevant for consideration in development of a model privacy policy framework for distance charging in the United States⁵.

⁴ For a more information on the legal basis for privacy protection in the United States, see Appendices B and D.

⁵ For a more information on the European Union's General Data Protection Regulations, see Appendix D.

3 THE CENTRAL ISSUES FOR A MODEL PRIVACY POLICY

3.1 Heavy versus light vehicles

While some privacy issues for operators and owners of heavy and light vehicles may be similar—such as integrity and accuracy of the data, responding to requests for exercise of rights, nondisclosure of personal information and security—concerns about government access to vehicle location and travel patterns tend to be less of a concern for heavy vehicles because commercial traffic is a regulated industry with minimal expectations for personal privacy. Accordingly, a model privacy policy for light vehicles, where the expectations of privacy are higher, may be more stringent than a privacy policy for heavy vehicles.

The model privacy policy for light vehicles is presented in section 8. A model privacy policy for heavy vehicles is not presented in this paper.

3.2 Central issues

The central issues for structuring the model privacy policy were determined through cross-analysis of three privacy laws of relevant to its development: the European Union’s General Data Protection Regulation (2018), the California Consumer Privacy Act of 2018, and the privacy protection provisions of the Oregon Road Usage Charge Program (OReGO), the only light vehicle privacy protection statute enacted into law.

3.2.1 Fundamentals: purpose, protected information, material scope, territorial scope

3.2.1.1 Stated purpose

The purpose of the model privacy policy will establish a central focus. It should directly relate to the essential function of the program for which the privacy policy is developed; that is protection of personal information of those participating in a RUC program.

For this purpose, personal information should identify a person or relate to a person in a way necessary for collection of travel data or payment of a RUC.

Recommendation: The model privacy policy should protect personal information collected under a RUC program from disclosure.

3.2.1.2 Definition of personal information: What is protected from disclosure?

The model privacy policy should protect from disclosure information identifying or nominally related to a person. Should the definition of personal information, however, include anonymized information collected from a RUC payer after a service provider has anonymized it? Information that comes from or relates to a person, even if the person can no longer be identified or related to it, could be treated as personal information. Such information should hold the status as a property right even though the owner is no longer apparent. The policy basis for protection of anonymized information is unclear.

In creating an exception from treating anonymized information as personal information, it may prove necessary to condition such an exception upon a service provider's implementation of technical safeguards and processes that prohibit re-identification or prevention of inadvertent release of the information. Otherwise, information that is anonymized may not stay that way thus undercutting any purpose for the exemption.

Recommendation: The model privacy policy should protect from disclosure any information identifying or nominally related to a RUC payer. There should be an exception for anonymized information provided the exception is conditioned upon the authorized agency or a service provider implementing technical safeguards and processes that prohibit re-identification or prevention of inadvertent release of the information.

3.2.1.3 Material scope: Which information should be protected under a model privacy policy?

The essential purpose of a RUC system is to collect travel data related to a particular vehicle to enable application of a charge rate to determine the charges due for a period of time. The system will also collect identifying information to associate the vehicle with its owner or lessee and financial information provided by the RUC payer to enable payment. This RUC information is necessary for the RUC program to collect; therefore, all of it should be considered personal information subject to the specific requirements, limitations, and prohibitions of a model privacy policy.

The question remains whether information collected beyond RUC information by a service provider should also be subject to the model privacy policy for a RUC program. This would include information used by the service provider to apply value-added services upon the request of a subject vehicle owner or lessee (RUC payer). The typical data used for value-added services will come from vehicle information accessed through the OBD-II port or other telematics. This may include driving behavior (speed, hard braking), maintenance (battery life, pollution control devices), travel location (ring fencing), among other vehicle and travel information.

Requiring a service provider to protect information acquired other than for the purpose of collecting a RUC will increase the cost of collection and impede formation of a private sector market in an account-based, open system. Reducing the operating costs to an affordable level is one of the principal challenges of implementing a RUC program into law. Taking advantage of an open, competitive market will put downward pressure on operating costs. Therefore, adding cost items or disadvantaging formation of an open market for RUC should be avoided unless it is part of a broader social policy applied to all businesses collecting online data.

Enactment of legislation applying a model privacy policy to “other than RUC” information should prove difficult politically. In the United States, only the state of California has enacted a broad-ranged privacy protection law for online, consumer data. Protecting the privacy of only RUC information should prove much easier to enact since broader societal issues would not come forward into the debate.

Recommendation: The model privacy policy should only protect RUC information.

3.2.1.4 Territorial scope: Who should protect personal information, the government or whoever holds the information?

In a RUC system, all elements of the data and RUC collection process flow from actions undertaken by the authorized agency. Forming an open market for collection of RUC will require the affirmation and actions of the authorized agency designated the responsibility to collect RUC in the authorizing legislation. The authorized agency will initiate and operate the procurement process for attracting and engaging service providers. With such authority, the authorized agency could impose its obligation to protect RUC information onto service providers as part of the contractual arrangement to perform services for the RUC program.

Alternatively, the model privacy policy could apply directly to RUC service providers alone and not the authorized agency. This is the approach undertaken in the European Union, California and Oregon laws. Such an approach requires adequate oversight and enforcement capabilities and all three laws do albeit differently.

Recommendation: The obligation to comply with the model privacy policy falls to whoever holds the information provided there is imposition of adequate oversight.

3.2.2 The basics: responsible agency, nature of protection, public records

3.2.2.1 Identifying the responsible agency

Whether a state adopting a RUC program authorizes an existing agency as the authorized agency to enforce protection of personal information accessed for the program or creates a new agency for this purpose will be determined by the traditions and culture for governmental institutions in that state. Examples of an existing agency charged with this responsibility include a department of transportation (per OReGO), vehicle registry agency, or a department of revenue. Creating a new agency for this purpose would have the advantage of establishment of a new agency culture around privacy protection but this outcome will likely depend upon the size of the program at the outset.

Recommendation: Designate an existing agency as the authorized agency responsible for protecting personal information in a RUC program.

3.2.2.2 Whether the authorized agency can operate as a service provider

While it is not necessary for a government agency to provide RUC services similar to a service provider certified to provide the same services, a state may prefer to have a government option to collect RUC and data rather than have only an open commercial market available for these services. Oregon's RUC Program (OReGO) is just such a program. California tested only an open commercial market in its pilot tests, and Washington is following suit. Opinions vary on this point. The model privacy policy allows for the option to go either way.

Recommendation: Appoint a state government agency to engage in road usage charge collection services similar to those provided by a service provider so that a RUC payer may have the choice of either collection of road usage charges by a contracted service provider or a government agency.

3.2.2.3 Nature of protection

A service provider of services related to collection of travel information and collection of a RUC from payers must have a designated responsibility to comply with a model privacy protection policy. In establishing Oregon's RUC program, the legislature applied specific requirements, limitations, and prohibitions directly related to protection of personal information collected for the program. In the Model California Road Charge Privacy Legislation, the California Technical Advisory Committee chose to recommend that a service provider and the authorized agency each should have assigned an affirmative public duty to protect the confidentiality of personal information and maintain reasonable security procedures and practices to protect against unauthorized access.

These two approaches can equally accomplish the same protection but interpretation of each will yield distinct results. The specificity of the Oregon approach can offer greater certainty to service providers and authorized agencies while the California approach offers a way for protection to grow as new situations arise.

Either way, the model privacy policy could direct service providers and the authorized agency to establish, publish and adhere to an organizational usage and privacy policy available in writing. While this is an added burden to the service providers and the authorize agency, establishing such a policy and committing to its application will put the privacy issue strongly before these entities with greater likelihood of adherence.

Recommendation: The model privacy policy should apply specific requirements, limitations and prohibitions directly related to protection of personal information collected for a RUC program and direct service providers and the authorized agency to establish, publish and adhere to an organizational usage and privacy policy available in writing.

3.2.2.4 RUC personal information as a public record

Many states have comprehensive public records laws to ensure transparency for government actions. Transparency for public information, of course, is a policy directly opposed to privacy for public information. There are exemptions to public records laws for certain types of sensitive information obtained by the government. Travel data and identity and financial information are certainly sensitive to most people and an exemption would be in order.

Recommendation: Personal information obtained for purposes of collecting a RUC should be designated a public record under public records laws but exempted from disclosure to protect the privacy of the RUC payer.

3.2.2.5 Exceptions to nondisclosure

Persons and entities necessary to operating the RUC system and facilitating payment must have access to and use personal information to fulfill their duties. The model privacy policy should provide an exception from non-disclosure for those participating in system operations and for the RUC payer. Other potential exceptions may include an entity for whom a RUC payer has given express approval to receive specific personal information and police officers who have a valid court order based on probable cause. A state may find reasonable other exceptions for other law enforcement activities.

Recommendation: The model privacy policy should exempt from the requirement for non-disclosure of personal information persons and entities operating the RUC system and facilitating payment to the extent necessary to fulfill their duties. Other exemption should include the RUC payer with regard to his or her own personal information and entities for whom the RUC payer has given express approval to receive specific personal information. Washington should consider other exceptions for law enforcement activities with probable cause for use of the personal information.

3.2.3 Rights of RUC payers

3.2.3.1 Which rights should a RUC payer have?

Rather than rely entirely on a government watchdog agency for oversight or self-monitored service providers to protect personal information, providing RUC payers certain rights and remedies can add another layer of protection.

First and foremost, an added layer of protection requires that the RUC payer can learn about the personal information held by an authorizing agency or service provider. This compels establishment of a right to access to personal information for RUC payers and to inquire about the nature, accuracy, status and use of their information and the right to examine it.

Should a RUC payer find errors or inaccuracies in the personal information, the RUC payer should have an ability to correct them. A RUC payer with a right to rectification of

errors or inaccuracies in personal information would enable an effective oversight mechanism from those with the best information.

To ensure a service provider cannot retain personal travel information for an unlimited period, RUC payers should have the right to erasure of location or daily metered use data no longer necessary for the purpose for which it was created, provided or accessed. This would include a time limit based on events such as payment, dispute resolution or noncompliance investigation.

If while exercising the right to examine personal information a RUC payer discovers that a service provider has not complied with a requirement to erase location and daily metered use data by mandated deadlines, the RUC payer should be able to demand erasure of that information by their own action.

A service provider should not be able to retain the location and daily metered use data beyond the time limit where the RUC payer consents to retention.

A second exception to erasure may include retention of records accumulated as anonymized aggregated information and used for purposes of traffic management and research. There is a valuable public purpose for transportation planning agencies to have access and use this information provided the information is managed in a way that there is no ability to identify individual RUC payers.

A third exception to erasure may include monthly summaries of metered use of subject vehicles but not location information. With specific travel information removed, these monthly summaries are necessary for proper accounting of the RUC accounts of RUC payers.

Finally, a state may decide that the obligation for erasure should not apply to the extent the location and daily metered use data is necessary to comply with legal obligations or actions taken with regard to legal claims.

A RUC payer with multiple options for service providers should be able to move their RUC account and services easily from one service provider to another. This right to portability is essential to an open, commercial market for providing RUC services.

Recommendation: A RUC payer should have the right to access, the right to inquire, and the right to examine personal information as well as the right to rectify errors or

inaccuracies in personal information and the right to erasure of location and metered use data after it is no longer needed following a specified period. Exceptions to erasure may include consent of the RUC payer, retention of anonymized aggregated information used for traffic management and research, and monthly summaries of metered use for accounting purposes.

3.2.3.2 Informing RUC payers of their rights

If a state establishes certain rights for RUC payers pertaining to their RUC information, the rights will only have import and proper effect if the persons affected have knowledge of them and specifically how to exercise them.

Recommendation: At the outset of the engagement, service providers for a RUC system should provide payers information of their rights pertaining to personal information and specifically how to exercise them.

3.2.3.3 Responding to a request for exercise of rights

The manner of response to the RUC payer's request for exercise of rights should not be left to the discretion of the service provider. To enable a response empowering the RUC payer's ability to exercise their rights, the specific requirements for the response should be described in law and a service provider must never refuse a request for exercise of rights.

To ensure transparency, a service provider should inform a RUC payer when the service provider decides not to comply with a request and the reasons for the noncompliance. A non-response would leave the RUC payer with no information upon which to seek remedies.

Recommendation: The specific requirements for responding to a request for exercise of rights—transparency, intelligible, easily accessible, clear and plain language—should be described in law. A service provider must never refuse a request for exercise of rights. Nevertheless, a service provider should inform a RUC payer when the service provider does not to comply with a request and the reasons for the noncompliance.

3.2.4 Consent

A privacy policy for a RUC program may include two types of consent should the policy allow for exceptions to protection of privacy for personal information. Generally, consent

means any freely given, specific, informed, unambiguous indication of the RUC payer's wishes. Another, and more specific, type of request is express approval of the entity with which personal information will be shared. It is important for RUC payers to approve precisely to whom and where their personal information goes. The OReGO program uses express approval in this manner to enable service providers to sell value-added services to RUC payers. This has the potential to reduce the cost of administration for a RUC program by allowing service providers to bundle services.

Not all consent requires the specificity of express approval. For example, approval of a service provider's retention of location and daily metered use data beyond the time limit would not require identification of an entity for sharing.

A RUC payer may change his or her mind about granting consent or express approval. In these case, a RUC payer should have the ability to withdraw consent or express approval.

Recommendation: The model privacy policy should define consent as any freely given, specific, informed, unambiguous indication of the RUC payer's wishes. The model privacy policy should provide for express approval for sharing of personal information with a specific entity. A RUC payer should be able to withdraw consent of express approval.

3.2.5 Treatment of RUC payers

Service providers may desire to treat RUC payers who exercise their rights differently than other RUC payers, either by charging fees or whether to provide services at all. For example, a service provider may refuse to provide service to a RUC payer who refuses to give express approval to sharing of personal information with a specific entity. In a fully-competitive, open, commercial market, such refusal may not prove impactful to RUC payers if they have an assortment of choices for service provision that offer an alternative. Until a fully-competitive, open, commercial RUC market develops, such refusal could be considered a discriminatory action reducing or even eliminating the rights of RUC payers. On the other hand, a service provider may be allowed to offer a different price to RUC payers for services as long as the price is directly related to the value provided.

Recommendation: A model privacy policy should prohibit service providers from engaging in discriminatory behavior against RUC payers for exercising their rights. A service provider may offer a different price to RUC payers for services as long as the price is directly related to the value provided.

3.2.6 Security

3.2.6.1 Security measures

Given the frequency and significance of data breaches in recent years, any new tax collection program that bases its calculation on sensitive information must have effective security measures. The integrity of, and public regard for, a RUC program will depend upon it. The security of RUC information held by service providers must be assured by application of appropriate technical and organizational security measures that ensure a level of security appropriate to the risk of disclosure.

Recommendation: A model privacy policy should require a service provider to implement security measures to protect personal information to a level appropriate to the risk of disclosure.

3.2.6.2 Security breach notices

Data breaches happen and they will happen, eventually, in a RUC system. To maintain positive public regard, a RUC system must assure the transparency of any data breach that occurs. This will require service providers to provide notice and details of the breach to the authorized agency as the oversight authority with responsibility to manage service provider performance. Service providers should provide notice of the breach to RUC payers if the service provider has not implemented appropriate security measures or managed the breach appropriately.

Recommendation: A model privacy policy should require a service provider to provide notice to the authorized agency when a breach happens and provide specific information to the authorized agency about the nature of the breach and its likely impact. Service providers should provide notice to RUC payers of any breach where the service provider has not implemented appropriate security measures, has not taken subsequent measures to reduce high risk or has not made an effective public communication about the breach.

3.2.7 Compliance

The GDPR in the European Union requires appointment of a data protection officer with defined tasks and responsibilities to ensure compliance with that privacy regulation. Such a person designated as contact for RUC payers exercising their rights and ensuring compliance with the requirements to protect personal information would enable similar assurance for a RUC system.

Recommendation: The model privacy policy should require a service provider to designate a personal information officer with the responsibility as contact for RUC payers and to ensure compliance.

3.2.8 Certification

Service providers for a RUC system should prove they can perform the required services before they get approval from the authorized agency to provide the services. This requires the authorized agency to establish certification mechanisms for service providers to demonstrate compliance with the model privacy policy.

An authorized agency may develop and apply the certification process for service providers to achieve accreditation. OReGO uses such a certification process for its service providers. Alternatively, the authorized agency may rely upon certification bodies to provide the process for service providers. Rather than develop individual certification processes from scratch and at significant cost to maintain this capability, it would behoove states to rely upon independent certification bodies to certify the service providers according to criteria set by the authorizing agency, especially if the states work together to select the appropriate certification bodies to apply common criteria. Certification bodies should be accredited by a competent supervisory authority or a national accreditation body.

Recommendation: The model privacy policy should require an authorized agency to establish certification mechanisms for service providers to demonstrate compliance with the privacy protection provisions. Certification bodies should issue and renew certifications on the basis of criteria set by the authorizing agency.

3.2.9 Remedies

A privacy protection program will only be as effective as the remedies available to enforce violations. General privacy protection laws in California and the European Union apply the following remedies, among others.

- ▶ The right to lodge a complaint with the authorizing agency;
- ▶ The right to an effective judicial remedy against a decision of an authorizing agency;
- ▶ The right to an effective judicial remedy against a service provider;
- ▶ The right to compensation for damages on account of behavior of service providers;
- ▶ Civil penalties for service providers who fail to cure violations of this policy;
- ▶ Specific civil penalties paid to aggrieved persons for security provision violations by service providers;
- ▶ The right for a public interest organization to present a claim or rights of an aggrieved person.

Recommendation: Washington should adopt an appropriate assortment of remedies to enable aggrieved RUC payers to seek redress for violation of their rights. The legislature should determine the precise nature of the set of remedies and the penalty amounts.

3.2.10 Choice of reporting methods

Oregon's RUC program offers motorists the choice of reporting method from at least two mileage reporting methods at least one of which does not require use of locational information, including specific origins or destinations, travel patterns or times of travel. This allows the RUC payer to assure that his or her preferences to use or not use location-aware reporting devices will be honored by personal preference.

This method of privacy-by-design may not be appropriate for states not allowing choices of mileage reporting options. Whether providing choice of reporting method can prove effective privacy-by-design will be determined by the type of reporting adopted in each state. This provision should therefore form part of the substantive portion of the authorizing legislation rather than as part of the model privacy protection provisions.

Recommendation: The model privacy policy need not include requirements for motorist choice of reporting method; rather such a provision should form part of the substantive portion of the authorizing legislation for a road usage charge program.

3.2.11 Preemption

State laws often preempt local governments from enacting law that conflicts with the state's laws. In most states, the state's constitution automatically preempts local laws that conflicts with state laws unless an exception is enacted.

Recommendation: In most states, a preemption clause is unnecessary and therefore not included in the model privacy policy.

3.2.12 Anonymization of information and data

The Model California Road Charge Privacy Legislation suggests an anonymization requirement for RUC information and data held by a service provider. This may add cost for no real benefit since the broader model privacy policy requires erasure of the location and metered use data within 30 days after this information is no longer needed for payment, dispute resolution or noncompliance investigation. When RUC payer has consented to a retention of location and metered use data for longer than the 30-day period, the data should be anonymized to protect a possibly indefinite retention period.

Recommendation: The model privacy policy should require anonymization of location and daily metered use data if a RUC payer consents to retention of the data beyond the 30-day erasure period following the later of payment, dispute resolution or noncompliance investigation.

3.2.13 Record of access

The Model California Road Charge Privacy Legislation suggests a requirement for a service provider to maintain a record of access to personal information in its possession. This requirement provides transparency for any audit, investigation pertaining to a data breach or exercise of the right of examination.

Recommendation: The model privacy policy should require a service provider to maintain a record of access to personal information the service provider holds.

3.3 European Union GDPR additional topics

The European Union's General Data Protection Regulation protects general consumer data on the Internet rather than specific data like data required for a RUC program. Some of the privacy protections provisions of the EU GDPR will not be appropriate or necessary for a RUC program. An assortment of these provisions are as follows.

- ▶ Right to restriction of, or object to, processing of personal data. Under the EU GDPR, this right applies to persons whose personal data ends up in a processor's possession without having given express consent. The location and/or daily metered use data provided for a road usage charge program is fundamental to participation in the program. If participants in a road usage charge program were to have the right to restrict or stop processing of this data, it is essentially the same as withdrawing from the program. The right to withdraw from the program is already available for a volunteer road usage charge program. There would be no right to withdraw from a mandatory road usage charge program. Therefore, the right to restrict processing or the right to object to processing personal travel data is unnecessary for a voluntary program and inappropriate for a mandatory program.
- ▶ Right to decision-making not based solely on automated processing. How to look at this issue depends on the type of road usage charge program enacted by a state's legislature. If a road usage charge program requires electronic reporting of vehicle travel data to calculate the charge, automatic processing is a fait accompli. If a road usage charge program offers motorists a choice between electronic reporting and manual reporting of vehicle travel data, then offering an alternative to automated processing makes this provision unnecessary.
- ▶ Broad requirements for controllers and processors of personal data. Service providers for a road usage charge program have specific functions approved by the authorized agency that are replete with performance standards and contractual requirements. Imposing broad regulatory requirements to these already-regulated functions is unnecessary.
- ▶ Requirements for a data protection and impact assessment and prior consultation. It will be necessary for road usage charge programs that use nongovernmental service providers to certify them as meeting criteria approved by the authorizing agency. During this certification process,

service providers who become certified will have successfully undertaken a data protection and impact assessment appropriate for providing road usage charge services. Undergoing an additional general data protection and impact assessment is unnecessary.

- ▶ Codes of conduct and monitoring of compliance thereto. The EU's GDPR requires establishment of codes of conduct and monitoring of compliance related to general data protection. A certification process for a road usage charge program should have performance standards that include codes of conduct directly related to services pertaining to collection of vehicle travel data. Additionally, the authorized agency's contracts with service providers should contain oversight provisions specifically related to road usage charge services. Imposing codes of conduct for general data protection and associated monitoring of compliance is unnecessary.
- ▶ Independent supervisory authorities. The EU's GDPR requires each member state to establish at least one independent supervisory authorities to monitor application of the regulations. The model privacy policy assumes that state legislatures will bestow similar authority on the authorized agency in a road usage charge program.

3.4 California Consumer Privacy Law additional topics

The California Consumer Privacy Law protects general consumer data on the Internet rather than specific data like data required for a road usage charge program. Some of the privacy protections provisions of the California Consumer Privacy Law will not be appropriate or necessary for a RUC program. An assortment of these provisions are as follows.

- ▶ Statutory restriction on sale of personal data. The model privacy policy for road usage charge programs places the RUC payer in the position of making the decision whether to expressly approve any sharing of personal information with another entity whether or not a sale of personal information is involved. If the RUC payer decides not to expressly approve of a service provider sharing personal information with another entity, then the sharing will be barred. Giving the RUC payer the decision-making authority over any sharing of personal information is much stronger than merely restricting sale.

- ▶ Right to opt out and opt in. Road usage charge programs that are voluntary in nature, like OReGO, already have opt-in, opt-out built into them. For mandatory road usage charge programs, the ability to opt-in or opt-out would be inappropriate.
- ▶ Civil action brought by Attorney General. Some states may decide to involve the state's attorney general in the enforcement regime of a road usage charge program. Whether to make the attorney general central to enforcement for a road usage charge program is up to the individual state.

4 EXISTING PRIVACY LAWS FOR MOTORIST INFORMATION IN WASHINGTON

4.1 Department of Licensing collection of personal information

The state of Washington's Department of Licensing (DOL) collects and protects discovery of sensitive personal information contained in the vehicle registry and driver identity records required by state law. The DOL uses information from the vehicle registry to apply laws requiring vehicle licensing, registration and titling. The DOL uses driver licensing and identification records to apply laws requiring licensing of drivers and permit holders and providing an identification card opportunity for non-drivers.

To perform these functions, DOL maintains records identifying residents of the state, identifying their vehicles and some of their characteristics and behaviors that are of a personal nature. Existing federal and state laws require DOL to implement protective measures against disclosure and inappropriate use of this sensitive information.

4.2 Privately-operated vehicle licensing offices

The DOL appoints several privately-operated vehicle licensing offices for each county as subagents to perform vehicle licensing-related services for drivers in Washington. A subagent is a private business which enters into a contract with a county auditor to perform vehicle title and licensing services. The DOL may approve an entity as a subagent for this purpose following a request by a county for an additional subagent provided the county conducts an open, competitive process for the opportunity.

Subagents perform the following vehicle-related functions on behalf of DOL,

- Renewal of vehicle tabs
- Obtaining new license plates
- Reporting vehicle sales or transfers of ownership
- Registering vehicles

- Purchasing trip permits
- Obtaining replacement titles
- Obtaining disabled parking placards or tabs

Necessarily, private sector entities operating as subagents collect sensitive personal information while servicing vehicle owners on behalf of the Department of Licensing.

4.3 Data retained by vehicle licensing offices for Washington RUC pilot

In the Washington Road Usage Charge Pilot Project, Washington's vehicle licensing offices (VLOs) tested various methods to gather mileage data used to calculate a per-mile road usage charge for participating motorists. Specifically, these offices collected personal information such as participant identity, vehicle information and total mileage driven during a reporting period.

For the pilot, the state's VLOs collected mileage data through a manual reporting method that does not involve wireless reporting nor collection of vehicle location data. To report mileage driven, participating motorists visited one of several designated VLOs for this purpose. These motorists accessed a smartphone provided by the VLO, took pictures of their vehicle's odometer and license plate and submitted the two photographs to the project team using a web application. The VLOs retained a log that the submission occurred, the date of submission and the driver's name and vehicle identification. The VLOs did not have access to or ability to retain submitted mileage data.

4.4 Privacy laws for management and protection of driver and vehicle-related personal information in Washington

4.4.1 The Driver's Privacy Protection Act of 1994

The Department of Licensing complies with the federal Driver's Privacy Protection Act of 1994 which prohibits the disclosure of personal information of motorists without their express consent. This obligation also applies to authorized recipients of personal information such as subagents for vehicle licensing services.

Under the law, the DOL and subagents may use personal information to perform their duties pertaining to driver and vehicles licensing. There are exceptions for use of personal information for production of statistical reports and research, bulk distribution of surveys and in court and by insurance companies, licensed private investigations and private toll facilities, among a few other transportation and business-related exceptions. This law allows individual states to allow other uses of this personal information.

Not simply applicable to distributors of personal information, this law also applies to receivers of driver's personal information for unlawful purposes. This law proscribes these receivers from making false statements to obtain personal information.

Criminal fines apply for noncompliance with this law. Drivers have a civil cause of action against those who unlawfully obtain their personal information.

Under the federal Driver's Privacy Protection Act, "personal information" means information that identifies an individual, including an individual's photograph, social security number, driver identification number, name, address, telephone number, and medical or disability information, but does not include information on vehicular accidents, driving violations, and driver's status. Thus, the information protected by the federal Driver's Privacy Protection Act applies only to a portion of the information gathered by the Department of Licensing. Further protection of sensitive information comes under Washington state law, as discussed in subsection 4.4.2.

4.4.2 [Washington statutory law for protection of driver information](#)

The Revised Code of Washington (RCW 46.12.630) protects from unauthorized disclosure lists of registered and legal owners of motor vehicles held by the Department of Licensing and other authorized entities and persons. This statute directs the DOL to provide owners lists to the manufacturer of the vehicles and permits DOL to provide lists only to the following other entities for the purposes specified,

- Manufacturers of motor vehicles, legitimate businesses, or their authorized agents to conduct research activities and production of statistical reports provided the information is not used for publishing, re-disclosure or contacting individuals;

- Any governmental agency of the United States or Canada, including political subdivisions, or its authorized agents, for enforcement of traffic laws;
- Insurers for purposes of claims investigation activities, antifraud activities, rating or underwriting;
- Any local government agency, or its agents for notification relating to towed or impounded vehicles;
- A government agency, commercial parking company, or its agents for notifications relating to outstanding parking violations;
- An authorized agent or contractor of the DOL for providing motor vehicle excise tax, licensing, title, and registration information to motor vehicle dealers;
- Any business regularly making loans to finance purchases of motor vehicles;
- A company or its agents operating a toll facility to identify toll violators.

Before DOL may release any lists of motor vehicle owners to any of these entities, DOL must enter into a contract with the entity. The contract must include requirements for the conduct of regular permissible use and data security audits demonstrating compliance with data security standards adopted by the Office of the Chief Information Officer.

This statute prohibits all the approved entities from releasing personal information for direct marketing purposes. The statute defines “personal information” in the same terms as the federal Driver’s Privacy Protection Act of 1994. The statute specifically proscribes release of an individual’s photograph, social security number or any medical or disability-related information for any purpose, describing this information as *highly restricted personal information*.

The penalty for using a list of registered and legal owners of motor vehicles for nonauthorized purposes is denial of further access to the information. The Washington Administrative Code (WAC 308-10-075(8)) requires assurance from receivers of information from DOL that the information is not used for a purpose contrary to the access agreement entered into with DOL. If this assurance is violated, the rule indicates the violator will be charged under the perjury laws of the state of Washington.

4.5 Comparison of information collected for RUC and DOL systems

The information collected by a road usage charge system and DOL is similar but *not* identical. The table below compares the information collected for both systems.

Table 4-1		
Comparison of Personal Information Collected in RUC and DOL Systems	RUC System	DOL System
Name	Yes	Yes
Access information	Yes	Yes
Driver ID number	Yes	Yes
Vehicle ID number	Yes	Yes
Vehicle plate number	Yes	Yes
Vehicle registration	Yes	Yes
Financial information	Yes	Potentially
Payment record	Yes	Yes
Date of Birth	No	Yes
Sex	No	Yes
Marital status	No	Yes
Organ donor status	No	Yes
Social security number	No	Yes
Permit number	No	Yes
ID card number	No	Yes
Vehicle title	No	Yes
Photograph	No	Yes
Proof of identity	No	Yes
Driving record	No	Yes
Vision exam report	No	Yes
Medical exam report	No	Yes
Hazardous materials endorsement	No	Yes
Penalties imposed	No	Yes
Alcohol or drug violations	No	Yes
Driving test results	No	Yes
Liability insurance	No	Yes
Veteran designation	No	Yes
Disabled parking eligibility	No	Yes
Vehicle report of sale	No	Yes
License suspensions	No	Yes
RUC Account ID number	Yes	No
ID code for mileage meter	Yes	No
Distance traveled data	Yes	No
Travel data record	Yes	No
RUC enforcement record	Yes	No

5 MODEL RUC PRIVACY POLICY FOR STATES

The model privacy policy was developed to guide legislative activity for Washington (and prospectively other states) on the issue of privacy protection in the context of a RUC program. This model privacy policy examined recent privacy policy law enactments in Oregon and the European Union and the state of California to compile a comprehensive policy proposal.

GENERAL PROVISIONS	
Stated Purpose	<p>This policy protects personal information collected pursuant to a Road Usage Charge Program from disclosure.</p> <p>A Road Usage Charge Program is a statutory program, supported by administrative rules, for collecting road usage charges for metered use of a subject vehicle on the highways of the state.</p>
Protected information	<p>Personal information means information or data that identifies, relates to or describes a person or entity that is obtained or developed in the course of reporting metered use by a subject vehicle, including but not limited to travel pattern data, or for providing administrative services related to the collection of road usage charges. Personal information does not include anonymized information or anonymized aggregated information.</p> <p>Anonymized information means information that cannot reasonably identify, relate to, describe, be capable of being associated with, or be linked, directly or indirectly, to a particular person, provided a service provider has implemented technical safeguards and processes that prohibit re-identification of the person, processes that prevent inadvertent release of the information and makes no attempt to re-identify the information.</p> <p>Anonymized aggregated information means aggregated information accumulated in a way that preserves the anonymity of the persons reporting metered use by a subject vehicle related to collection of a road usage charge and cannot create travel pattern data nor reasonably identify, relate to, describe, be capable of being associated with, or be linked, directly or indirectly, to a particular person.</p> <p>Travel pattern data means location and daily metered use data of a subject vehicle and data that describes a person’s travel habits in sufficient detail that the person becomes identifiable either through the data itself or by combining publicly available information, or information available to the service provider, with the data.</p>
Material Scope	<p>This policy applies to processing of personal information reported by a road usage charge payer for a subject vehicle wholly or partly by automated or other means for purposes of paying a road usage charge for metered use by a subject vehicle of the highways of the state.</p> <p>Processing means any operation or set of operations that are performed on personal information or on sets of personal information, whether or not by automated means.</p> <p>A road usage charge payer means a registered owner or lessee of a subject vehicle.</p>

Registered owner means a person, other than a vehicle dealer, that is required to register a motor vehicle in the state.

Lessee means a person that leases a motor vehicle that is required to be registered in the state.

Subject vehicle means a motor vehicle that is subject to the Road Usage Charge Program.

Territorial Scope This policy applies to the processing of personal information by a commercial or government entity, whether established in the state or not, where activities relate to collection of a road usage charge irrespective of payment.

PRINCIPLES

Principles for lawful processing of personal information

An authorized agency shall ensure protection of the confidentiality of personal information used for reporting metered use by a subject vehicle or for administrative services related to the collection of the road usage charge under its authority.

[If a state’s public records laws grant public access to driving records,] personal information used for reporting metered use by a subject vehicle or for administrative services related to the collection of the road usage charge is a public record exempt from disclosure.

Information collected for use in a Road Usage Charge Program shall be accurate, relevant and collected and processed in a transparent manner only for use in collecting a road usage charge from a road usage charge payer for a subject vehicle. The personal information shall be kept in a form which permits identification of the subject vehicle and its registered owner or lessee no longer than necessary and processed in a manner that ensures appropriate security, using appropriate technical or organizational measures.

No person or entity involved with collection of a road usage charge may disclose personal information used or developed for reporting metered use by a subject vehicle or for administrative services related to collection of road usage charges to any person, except to the following recipients limited to the information necessary to the respective recipient’s function in collecting road usage charges:

- the road usage charge payer;
- a financial institution, for the purpose of collecting road usage chargers owed;
- employees of the authorized agency;
- a service provider;
- a contractor for a service provider, but only to the extent the contractor provides services directly related to an agreement with the authorized agency;
- an entity expressly approved to receive the information by the road usage charge payer for the subject vehicle;
- 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 the person to who the requested information pertains.

An authorized agency or service provider that accesses or provides access to personal information shall maintain a record of that access. The access control log shall include:

- Date and time the information is accessed;
- The data elements used to query the road usage charge database or system;
- The person accessing the personal information;
- The purpose for accessing the information.

A **service provider** means an entity that has entered into an agreement with the authorized agency for reporting metered use by a subject vehicle or for administrative services related to the collection of road usage charges, and authorized employees and contracted entities of the entity. The state may appoint a state agency to act as a service provider as an alternative to a contracted service provider.

Authorized agency means a government agency assigned the responsibility and given the authority by authorizing legislation to implement and operate the Road Usage Charge Program.

Express approval means active approval, either electronic or on paper, by a road usage charge payer that identifies the entity with which personal information will be shared. The request for express approval must be clearly distinguishable, intelligible and easily accessible in clear and plain language. If this provision is infringed, the express approval will not be binding.

The person providing personal information has right to withdraw express approval at any time. Withdrawal of express approval shall not affect lawfulness of express approval given before withdrawal provided the person was informed thereof. It shall be as easy to withdraw as give express approval.

RIGHTS

Right to transparency and modalities

The service provider shall provide information related to rights pertaining to personal information in writing, or where appropriate, by electronic means, in a concise, transparent, intelligible and easily accessible form, using clear and plain language. The information may be provided orally if requested by the road usage charge payer.

The service provider shall post the information on its website and also deliver the information within 10 days of receipt of a request for this information from a road usage charge payer or a representative of the road usage charge payer.

The service provider shall facilitate the exercise of these rights and shall not refuse to act upon the request of a road usage charge payer.

The service provider shall provide information upon a request for exercise of rights pertaining to personal information without undue delay and no longer than 15 days of receipt of a request. Where request is made by electronic means, the information can be provided by electronic means. The time period for compliance may only be extended for a reasonable time period in order to confirm the identity of the road usage charge payer or the legal status of the road usage charge payer's representative.

If service provider does not take action on the request of the road usage charge payer, the service provider shall inform the road usage charge payer, without delay, but no later than one month after receipt of the request of the reasons for not taking action and the possibility for lodging a complaint with the authorizing agency and seeking judicial remedy.

<p><i>Rights to provision of information where personal information is collected from a road usage charge payer</i></p>	<p>At the time when the service provider obtains personal information from the road usage charge payer, the service provider shall provide the road usage charge payer the following information free of charge in an easily visible, intelligible and clearly legible manner, to ensure fair and transparent processing:</p> <ul style="list-style-type: none"> • identity and contact details of the service provider; • contact details of the designated personal information officer which the service provider has assigned responsibility for managing personal information protection and rights thereto; • the period of storage or criteria to determine that period; • existence of the right to request access to and rectification or erasure of personal information and the right to portability; • recipients, or categories of recipients, of the personal information, if any. • the existence of right to withdraw consent at any time without affecting the lawfulness of the processing on the prior consent or express approval; • the right to lodge a complaint with the authorized agency; • whether the provision of personal information is a statutory or contractual requirement, or necessary to enter into a contract, and whether the road usage charge payer is obliged to provide personal information and possible consequences of failure to do so.
<p><i>Right to access by road usage charge payer</i></p>	<p>A road usage charge payer has the right to inquire about the nature, accuracy, status and use of personal information and the right to examine the personal information, or a reasonable facsimile thereof.</p> <p>A road usage charge payer has the right to lodge a third-party complaint with the authorized agency.</p> <p>The service provider shall respond to requests for inquiry or examination within five business days of receipt of the request.</p> <p>The service provider shall disclose and deliver the requested personal information free of charge. The information may be provided by mail or electronically and if so portably and in a readily useable format that allows the road usage charge payer to transmit this information to another service provider or the authorizing authority without hindrance.</p>
<p><i>Right to rectification</i></p>	<p>The road usage charge payer has the right to request rectification of personal information upon provision of reasonable evidence that the information has errors or has changed.</p> <p>The service provider shall respond to requests rectification within five business days of receipt of the request.</p>

<p>Right to erasure</p>	<p>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 service provider shall erase records of the location and daily metered use of subject vehicles. The road usage charge payer has the right to erasure of personal information no longer necessary to fulfill duties under the Road Usage Charge Program without undue delay and the service provider has the obligation to erase personal information no longer necessary to fulfill duties under the Road Usage Charge Program without undue delay.</p> <p>Non-compliance investigation means an investigation by the authorized agency to determine if, and to what extent, any person, including but not limited to a road usage charge payer, is in compliance with the statutory provisions of the Road Usage Charge Program and associated administrative rules. Such investigations may include informal inquiries or a formal review of the relevant records and the mileage reporting method of the road usage charge payer or manager of accounts to ascertain the extent of non-compliance, if any.</p> <p>The road usage charge payer for a subject vehicle has the right to erasure of the location and daily metered use data that has not been destroyed within the required period of time. The service provider shall respond to requests for erasure within five business days of receipt of the request.</p> <p>Exceptions:</p> <ul style="list-style-type: none"> • Records accumulated as anonymized aggregated information may be retained and used for purposes of traffic management and research. • Monthly summaries of metered use by subject vehicles retained by the authorized agency or a service provider that include vehicle identification numbers of subject vehicles and associated total metered use during the month but not location information. • A service provider may retain and use records of location and daily metered use of subject vehicles if the road usage charge payer for the subject vehicle consents to the retention. In this context, consent means voluntary agreement given to retain location and daily metered use data beyond the period required by law. Consent does not entitle the authorized agency to obtain or use the records or the information in the records. Any records retained by authority of consent of the road usage charge payer shall be anonymized. <p>The right of erasure shall not apply to the extent processing is necessary for compliance with a legal obligation or establishment, exercise or defense of legal claims.</p> <p>The service provider shall communicate any rectification or erasure of personal information to each recipient to which personal information were disclosed and inform road usage charge payers about recipients, if requested.</p>
<p>Conditions for consent</p>	<p>Consent means any freely given, specific, informed and unambiguous indication of the road usage charge payer’s wishes signifies agreement to collection and processing of metered use data for use in assessing a road usage charge.</p> <p>A road usage charge payer has the right to withdraw consent at any time. Withdrawal of consent shall not affect lawfulness of consent given before withdrawal provided road usage charge payer was informed thereof. It shall be as easy to withdraw as give consent.</p>
<p>Right to portability</p>	<p>A road usage charge payer has right to receive personal information provided to a service provider in a secure, structured, commonly used and machine-readable format and has the right to transmit that personal information to another service provider without hindrance.</p> <p>A road usage charge payer has the right to have personal information securely transmitted directly from one service provider to another where technically feasible.</p>

<p>No discrimination for exercise of rights</p>	<p>A service provider shall not discriminate against a road usage charge payer because the road usage charge payer did not give express approval to the service provider to enable sharing of personal information.</p> <p>A service provider may offer a different price, rate, level, or quality of goods or services to the road usage charge payer if that price or difference is directly related to the value provided to the road usage charge payer by the road usage charge payer's personal information.</p> <p>A service provider shall not use financial incentive practices that are unjust, unreasonable, coercive, or usurious in nature.</p>
<p>SECURITY</p>	
<p>Security of processing</p>	<p>The service provider shall implement appropriate technical and organizational measures to ensure a level of security appropriate to the risk of destruction, loss, alteration, unauthorized disclosure of or access to personal information, including but not limited to the following:</p> <ul style="list-style-type: none"> • pseudonymization and encryption of personal information; • ability to ensure ongoing confidentiality, integrity, availability and resilience of processing systems and services; • ability to restore availability and access to personal information in a timely manner in event of an incident. <p>Pseudonymization means the processing of personal information in a manner that renders the personal information no longer attributable to a specific road usage charge payer without the use of additional information.</p>
<p>Notification of personal information breach</p>	<p>For a personal information breach, the service provider shall without undue delay and where feasible, not later than 72 hours after awareness of it, notify the breach to the authorized agency unless it is unlikely there is risk to rights and freedoms of natural persons. Where notice is not made within 72 hours, it shall contain reasons for the delay.</p> <p>The notification shall:</p> <ul style="list-style-type: none"> • describe the nature of the personal information breach, including the categories and approximate number of road usage charge payers and personal information records involved; • communicate the name and contact details of the designated personal information officer of the service provider or other contact; • describe the likely consequences; • describe the measures taken to address the personal information breach, its effects and remedial action taken, including measures to mitigate. This information may be provided in phases where this information cannot be provided at the same time.
<p>Communication of personal information breach to road usage charge payers</p>	<p>Where a personal information breach is likely to result in high risk to rights and freedoms of natural persons, the service provider shall communicate the breach in clear and plain language to the road usage charge payer without delay.</p> <p>The communication shall not be required if:</p> <ul style="list-style-type: none"> • service provider has implemented appropriate technical and organizational measures which were applied to the personal information affected by the breach; • service provider has taken subsequent measures which ensure high risk to rights and freedoms of road usage charge payers are unlikely to materialize; • it would involve a disproportionate effort and a public communication is made that is equally effective.

If the service provider makes no communication about a personal information breach, the authorized agency may require a service provider to do so.

PERSONAL INFORMATION OFFICER

Designation of personal information officer

A service provider shall designate a personal information officer to enable contact with road usage charge payers and the authorizing agency for purposes of assuring compliance with this policy.

The designated personal information officer may be a staff member of the service provider (or fulfill the tasks on the basis of a service contract) but shall be designated on the basis of professional qualities and expert knowledge of personal information protection under this policy and practices and ability to fulfill tasks.

Organizational usage and privacy policy

The authorized agency and service providers shall establish, publish and adhere to an organizational usage and privacy policy. The organizational usage and privacy policy shall be available in writing to road usage charge payers, and shall be posted conspicuously on the authorized agency's website and each service provider's website.

The organizational usage and privacy policy shall include:

- The authorize purpose for collecting personal information;
- The identity and designated tasks for the personal information officer;
- Description of the employees and contractors authorized to access and collect personal information and identification of training requirements necessary for the employees and contractors;
- Description of how the personal information shall be monitored to ensure compliance with applicable privacy laws and a process for periodic system audits;
- Description of reasonable measures that will be used to ensure the accuracy of the personal information and correction of information errors;
- Description of how compliance with security procedures and practices will be implemented and maintained;
- Description of how compliance with the rights of road usage charge payers designated by this policy will be maintained;
- The period for which the personal information will be stored or retained, by category;
- The purpose of, and process for, sharing or disseminating personal information with other persons, whether by those authorized under this policy or by consent of motorists under this policy.

CERTIFICATION

Certification

The authorized agency shall establish certification mechanisms for service providers to demonstrate compliance with the requirements of this policy. Certification bodies shall issue and renew certification on the basis of criteria approved by the authorizing agency. Certification may be withdrawn where requirements for certification are no longer met.

Certification bodies

Independent certification bodies shall be accredited by a competent supervisory authority or a national accreditation body. Certification bodies shall be accredited for a maximum of five years according to certain criteria established by a competent supervisory authority or a national accreditation body.

REMEDIES	
<i>Right to lodge complaint with authorized agency</i>	Every road usage charge payer has the right to lodge a complaint with an authorized agency which shall inform the complainant on the progress and outcome of the complaint and the possibility of judicial remedy.
<i>Right to effective judicial remedy against authorized agency</i>	Each road usage charge payer has rights to an effective judicial remedy against a legally binding decision of an authorized agency concerning them. Each road usage charge payer has a right to an effective judicial remedy where the authorized agency does not handle a complaint or does not inform the road usage charge payer within 3 months on the progress or outcome of complaint lodged.
<i>Right to effective judicial remedy against service provider</i>	Without prejudice against any other available administrative or non-judicial remedy, each road usage charge payer has the right to an effective judicial remedy where rights are considered to have been infringed by a service provider in non-compliance with this policy.
<i>Representation of road usage charge payers</i>	A road usage charge payer has the right to mandate that a properly constituted public interest organization present a claim or rights on his/her behalf.
<i>Rights to compensation and liability</i>	Road usage charge payers shall have the right to compensation for damages suffered by the actions of service providers which infringe upon rights and responsibilities contained in this policy.
<i>General conditions for imposing administrative fines / Civil actions</i>	Any service provider shall be in violation of this policy for failing to cure any alleged violation within 30 days after notification of alleged noncompliance and therefore liable for civil penalty. Any service provider that intentionally violates this policy shall be liable for a civil penalty of up to \$XXXX for each violation but may be adjusted as necessary to ensure the costs incurred by the state are covered.
<i>Civil action for security violations</i>	Any road usage charge payer whose personal information is subject to unauthorized access and exfiltration, theft or disclosure as a result of the business's violation of the duty of to implement and maintain reasonable security practices may institute a civil action to recover damages not less than \$XXX or greater than \$XXX per incident or actual damages, based on circumstances, whichever is greater, injunctive or declaratory relief, or any other relief the court deems proper.
MISCELLANEOUS	
<i>Compliance with other laws</i>	This policy does not affect compliance with other federal, state or local laws or civil, criminal, or regulatory inquiries, investigation, or subpoenas or summons issues by federal, state or local authorities or cooperation with law enforcement agencies.
<i>Regulations</i>	The authorized agency shall solicit broad public participation to adopt regulations on or before the operative date for this policy.
<i>Attempts to avoid the reach of this policy</i>	If a series of steps or transactions were component parts of a single transaction intended to avoid the reach of this policy, a court shall regard the intermediate steps or transactions.
<i>Inapplicability of waiver</i>	Any provision in a contract that purports to waive or limit road usage charge rights under this policy shall be void and unenforceable.

6 APPLICATION OF THE MODEL PRIVACY POLICY FOR A ROAD USAGE CHARGE SYSTEM IN WASHINGTON

6.1 Existing privacy law applications in Washington in context of the Model RUC Privacy Policy

Washington state applies existing state and federal law to protect sensitive personal information obtained by the Department of Licensing in the performance of its statutory duties. A road usage charge system must access similar personal information to enable collection of road usage charges. The purpose of each program differs enough, however, to indicate that a separate privacy law should be enacted simply for the protection of personal information in a RUC system albeit one aligned with the existing statutory protections for information contained in the state's vehicle registry. This section compares the existing driver privacy protections in Washington with those of the Model RUC Privacy Policy and draws a conclusion about how personal information in a RUC system could be afforded the best protection.

6.2 Protected information

As table 4-1 indicates, much of the information DOL collects to perform the agency's mandated activities is not required for collection in a road usage charge system. Information related to the ability to drive, driving record, violations, record of insurance and various statuses are simply not relevant to collection of a road usage charge. Similarly, some of the information collected by a road usage charge system is not relevant for collection by DOL, such as distance traveled data, travel data record, RUC account identification number, identification code for a mileage meter and RUC enforcement record. Therefore, to protect personal information collected in a RUC system, an application of the Model RUC Privacy Policy would require a definition of *personal information* aligned completely with RUC.

6.3 Territorial scope

The application of the Model RUC Privacy Policy to commercial or private entities will depend upon the particular RUC system adopted in the state of Washington. The Washington RUC pilot used private sector entities to collect travel data and RUC revenue

and manage a RUC account for each payer. Alternatively, a RUC system could have a government agency perform these activities. Or, there could be options for both private and public entities administering RUC accounts. Whichever RUC system is ultimately adopted, the entities performing RUC administrative activities must comply with the privacy protection provisions in a RUC law.

6.4 Principles for processing of personal information

In a road usage charge program adopted in Washington state, it will be necessary for the entities involved with collection of RUC data and revenue to be able to access the state's vehicle registry. Therefore, any RUC legislation passed must allow these entities to obtain lists of the vehicle registry and the associated registered owners or lessees and require these entities to enter into a contract with DOL in accordance with RCW 46.12.630. To align with this existing statute, this contract must include requirements for the conduct of regular permissible use and data security audits that demonstrate compliance with data security standards adopted by the Office of the Chief Information Officer.

Restrictions on disclosure of personal information in a RUC system would differ from those for DOL. The relevant statute mandating protection of DOL information, RCW 46.12.630, is less specific about who can use protected information, leaving the specifics to the contractual discretion of DOL, while the Model RUC Privacy Policy specifically names other recipients which can use personal information in the performance of their respective functions in collecting road usage charges. Nevertheless, the two policies should integrate well with DOL regulating access to the personal information it holds and manages.

6.5 Rights

The laws governing DOL do not establish statutory rights for access, rectification, erasure, portability and conditions for consent as does the Model RUC Privacy Policy. Should issues pertaining to these rights arise in the DOL system, they would be managed by establishing internal policies. Since protection of privacy is one of the leading issues for adoption of a RUC system, any legislation adopting a RUC program will likely require establishment of statutory protection of these rights.

6.6 Security

The writers of RCW 46.12.630 were certainly considering security when its provisions were drafted but they chose to allow DOL the authority to determine on a case-by-case contractual basis the nature of the security measures imposed on subject entities receiving personal information from DOL. The Model RUC Privacy Policy establishes a standard for protection of personal information collected in a RUC system and also mandates notifications of breaches. The RUC security provisions will likely be required by privacy advocates for a RUC system.

6.7 Personal information officer

The Model RUC Privacy Policy requires an entity collecting RUC data and revenues to appoint a personal information officer with specific duties relating to the payers and assurance of establishment and adherence to an internal organizational usage and privacy policy. While DOL could exercise this type of provision in a contract with recipient entities, the agency is not required to do so.

6.8 Certification

The Model RUC Privacy Policy requires certification of entities collecting RUC data and revenues to demonstrate compliance with its requirements. DOL has no certification process but could establish by contract one on a case-by-case basis.

6.9 Remedies

The only remedy RCW 46.12.630 establishes for violation of a DOL nondisclosure contractual requirement is denial of access to the lists of personal information. The Model RUC Privacy Policy's remedies are much more robust, including judicial remedies, rights to compensation, liability and administrative fines.

The federal Driver's Privacy Protection Act of 1994 is also robust as it applies to disclosure of protected information, including application of criminal fines for noncompliance with this law. Furthermore, drivers have a civil cause of action against those who unlawfully obtain their personal information.

6.10 Conclusion

While the law governing DOL's protection of personal information applies to some of the information necessary for collection of a road usage charge, it is not as robust or as

protective as the Model RUC Privacy Policy nor do the laws applicable to DOL apply to all types of personal information collected in a RUC system. Thus, protection of personal information in RUC system should occur by statutory enactment of the Model RUC Privacy Policy. Even so, because of the need for RUC collection entities to access the DOL's vehicle registry, the two public policies should be integrated to achieve that accessibility.

7 CONCLUSION

While ensuring technical protections for personal information in a road usage charge system is important to establishing integrity for road usage charge programs, agreement on specific law-based protections will be necessary to obtain enough public confidence to enable road usage charge statutory enactments. A stringent model privacy policy energized with contemporary legal protections for consumer data in Oregon, California and the European Union should help to reduce public angst over road usage charges. Further negotiation of these privacy policies with privacy advocates in a legislative process may well calm public concerns over privacy in a road usage charge system sufficient to enable enactment of the program in law.

APPENDIX A: PRIVACY EMERGING AS A CRITICAL ISSUE

I. Privacy in early RUC investigations

The theory of charging vehicle owner/operators by the amount of distance traveled emerged during the final decades of the 20th century. Practical proposals failed to develop, however, until global positioning system (GPS) technology reached commercial viability toward the end of the century. With GPS technology installed in a vehicle, travel coordinates can reveal the location, time, and amount of vehicle travel over a specific time period for purposes of imposing a charge on distance traveled within a jurisdiction.

In the early years of distance charge development, researchers and privacy advocates quickly identified privacy protection as the fundamental hurdle for enactment of RUC legislation. The potential for collectors of GPS data to know a person's precise travel history elicited a gut reaction from nearly everyone considering the concept that most people would have strong concerns about any entity possessing that information.

Minnesota

Some of the earliest research on charging by distance traveled was done during the mid-1990s for the Minnesota Department of Transportation (MnDOT) and the Metropolitan Council under the sponsorship of the U.S. Federal Highway Administration (FHWA). The privacy issue was not an official concern stated in this research, probably because the researchers proposed collecting vehicle miles traveled through an electronic odometer device read at the fuel pump or border crossings rather than through a wireless GPS device. The 1997 Minnesota report did not specifically describe how the electronic odometer would work technologically; rather, it described only the collection of an aggregation of miles traveled with an aggregate of out-of-state miles subtracted to calculate the sum due for specific period.⁶ Thus, there would be no generation or reporting of either vehicle location or travel time. A demonstration of this system was never piloted.

15-state consortium

Three years later, MnDOT and the University of Iowa formed and led a 15-state pooled fund to update the exploration of an electronically oriented distance-based RUC. This

⁶ Minnesota Department of Transportation and Metropolitan Council, Road Pricing Study: Final Report, March 1997.

time the central technology focus was on GPS technology. In a technical report entitled *A New Approach to Assessing Road User Charges*, the privacy issue took center stage⁷.

The report analyzed the privacy issue from two perspectives. First, the report examined whether the new approach to RUC constituted an invasion of motorist privacy in light of existing privacy law in torts, administrative law, and criminal law. The report concluded, “[O]ur review of legal precedent found nothing that indicates the new approach to assessing road user charges would constitute an invasion of motorists’ privacy.”⁸

Secondly, the report analyzed whether and how technical safeguards could be designed to protect the privacy of motorists. Examining the technology and methods available at the time (2002), the report’s authors concluded:

“The real issues are most likely to center around implementation. How detailed the data are that the on-board computer stores for uploading to the collection center will be a prime consideration. Steps the collection center may take to ensure anonymity of the traveler when analyzing and presenting the resulting trip data also will be highly important. Additionally, it will be advisable to assure the motoring public that the only uses of the data will be for assessing road user charges and (optionally) technical analyses associated with providing transportation services⁹.”

The report did not consider proposing legal constraints on the use of travel data in a RUC system, save for suggesting “criminal sanctions to regulate employee conduct.”¹⁰ Rather, the report’s authors viewed the protection of privacy from the technical perspective alone, presuming that sufficient technical protections—such as securely encrypted databases—would be sufficient to garner public confidence in a RUC system.

Oregon

In 2001, the Oregon Legislative Assembly formed the Road User Fee Task Force (RUFTF) to explore a new user fee for funding the road system to replace the fuel tax.

⁷ Forkenbrock, David J. and Kuhl, Jon G, *A New Approach to Assessing Road User Charges*. Transportation Policy Research. Iowa City: University of Iowa Public Policy Center; 2002.

⁸ *Ibid*, p. 89.

⁹ *Ibid*, p. 90.

¹⁰ *Ibid*, p. 89.

The Oregon legislature also directed the Oregon Department of Transportation to test the RUFTF's proposal in a pilot test.

At the first meeting of the RUFTF on November 30, 2001, the task force learned GPS technology was likely to be tested. The task force members immediately predicted the public would demand protection of personal privacy and insisted on protection of privacy under any scenario tested.

II. Privacy as a demonstrated concern of the public

When use of GPS technology to collect travel data was only theory, there was no pushback from the public or the media. Once a government agency revealed a study to explore the use of GPS technologies for collecting data for a road usage charge, the media put a bright spotlight on the concept and assumed the worst.

The RUFTF's prediction of a public outcry came to pass following the first news story in Oregon in December 2002 that GPS devices were under consideration for use in trials.¹¹ During the media storm that following, privacy concerns emerged with a fury, lasting 60 straight days. No matter the political leanings of the individual media outlets, the general tone was all negative. The first neutral news story appeared in *Wired Magazine* five months later. The use of GPS technology in pilot tests raised suspicions.

To this day, public concerns about RUC often center on privacy, including in Washington. In the public survey conducted prior to the launch of the WA RUC pilot in 2017, 20% of respondents identified protection of personal information as the most important issue to them. In the first survey of pilot participants conducted in early 2018, privacy ranked as the top issue, with 83% of respondents characterizing it as "very important" to them.

¹¹ *Albany Democrat-Herald*, December 30, 2002.

APPENDIX B: LEGAL BASIS FOR FEDERAL PRIVACY PROTECTION IN THE UNITED STATES

I. Government action

The United States Constitution, including the Bill of Rights, empowers the federal government and places limits on government actions. While the U. S. Constitution does not explicitly mention a right to privacy, the United States Supreme Court has ruled on various occasions that a right to privacy exists with respect to federal or state government actions.

U. S. Supreme Court cases

The U. S. Supreme Court first recognized a constitutional right to privacy in Griswold v. Connecticut,¹² inferred from the penumbras of other expressly stated rights to privacy such as the right of association (the 1st Amendment), the prohibition against the quartering of soldiers in any house in time of peace without consent (the 3rd Amendment), the right against unreasonable searches and seizures (the 4th Amendment), the right against self-incrimination (the 5th Amendment), and other rights retained by the people (the 9th Amendment). The Court found that taking the penumbras together the U. S. Constitution creates a *zone of privacy*.

In succeeding cases, the Supreme Court bolstered the right to privacy by deriving the right to privacy from the right to personal liberty under the Due Process Clause of the 14th Amendment.¹³ According to the Supreme Court, the Constitution protects against government action depriving persons the right of privacy. However, the Court has not inferred a government obligation to protect against access or use of private or sensitive information generally.

In Carpenter v United States,¹⁴ the Supreme Court denied a government agency unrestricted access to a wireless carrier's database of physical location information unless a warrant is obtained. In the earlier case of United States v. Jones,¹⁵ the Supreme Court limited the use of GPS devices by police officers to track the movement of

¹² Griswold v. Connecticut, 381 U.S. 479 (1965)

¹³ Eisenstadt v. Baird, 405 U.S. 438 (1972); Roe v. Wade, 410 U.S. 113 (1973); Lawrence v. Texas, 539 U.S. 558 (2003).

¹⁴ Carpenter v. United States, 585 U.S. ____ (2018)

¹⁵ United States v. Jones, 565 U.S. 400 (2012)

suspects. These rulings protect individuals from government agencies having unfettered access to their personal travel information without proving probable cause. A RUC program should not have constraints on the use of data from location-aware devices as long as the use of the information obtained from these devices is limited to calculation of a RUC and cannot, by law, be used for any other purpose, such as an investigation or surveillance, without proof of probable cause.

II. Private action

Law governing private action pertaining to personal data and information come from common law or the statutory enactments of Congress or state legislatures.

Common law

Under common law, each person has the right of freedom from invasion of privacy. This right is actionable as a tort when a person wrongfully intrudes upon the private affairs or information of another person in a manner that causes mental suffering in some form. Prior to any statutory protections, the only redress available under common law was filing a lawsuit in an appropriate jurisdiction seeking an award of damages.

US statutory protections for privacy of personal data and information

The United States Congress enacted the Privacy Act of 1974 to govern the collection, maintenance, use, and dissemination of personal records about individuals held by federal agencies. The Privacy Act prohibits disclosure of personal records about an individual to third parties without the consent of the individual. There are 12 statutory exceptions. Under the Privacy Act, individuals may access their records and have them amended.

Congress has not enacted a general privacy law to protect from disclosure personal data and information held by private persons or entities. All congressional enactments protecting personal data and information held by private persons or entities are specific to certain categories of information. The following are an assortment of federal privacy protection laws for specific information in the United States:

- ▶ Children’s Privacy
 - > Children’s Online Privacy Protection Act ([online personal information of children](#))
- ▶ Communications

- > The Electronic Communications Privacy Act, 1986 (communications interception)
- > Telephone Consumer Protection Act of 1991 (telephone solicitations)
- ▶ Financial
 - > Fair Credit Reporting Act, 1970 (credit records)
 - > Right to Financial Privacy Act, 1978 (financial records)
 - > Taxpayer Browsing Protection Act, 1997 (tax returns)
 - > Gramm Leach Bliley Act (1999) (financial records)
 - > Fair and Accurate Credit Transactions Act, 2003 (identity theft prevention)
- ▶ Medical
 - > Health Insurance Portability and Accountability Act of 1996 (medical records)

APPENDIX C: DEVELOPMENT OF PRIVACY PROTECTION POLICIES FOR U.S. ROAD USAGE CHARGE PROGRAMS

I. Policy task forces and pilot programs of the states

Beginning with Oregon in 2001 followed by Washington in 2012 and California in 2014, state legislatures directed state agencies to work with independently-appointed bodies to adopt policies for a distance-based charge followed by demonstration in a pilot program. Protection of privacy was among the top issues for analysis and development of solutions in each state.

Oregon

Road User Fee Task Force (RUFTF). In a March 2003 report laying out recommendations for a distance charge pilot program, Oregon's Road User Fee Task Force recognized that much of the public was "uncomfortable with a government or other entity having the ability to follow vehicle movement either in real time or from travel history." The task force adopted a policy of assurance for those paying a distance-based charge that technology would not be used to violate their expectations of privacy.

The RUFTF focused on a two-track solution. One track focused solely on technology-based solutions, with focus on data transmission limitations so there would be only transfers of summary data from the vehicle rather than detailed travel coordinates. For the second track, the RUFTF proposed a law-based solution whereby the task force recommended the state legislature enact legislation prohibiting anyone connected with a state agency from accessing a GPS device to locate passenger vehicles either in real-time or by their travel history.

Oregon's first stage (2001-2007). The first Oregon distance charge pilot program deployed the RUFTF recommendation for the technology-based privacy solution by using a "thick client" device to travel data transmission. The deployed thick client device used GPS coordinates to identify a pre-defined zone for travel and used the vehicle's speed sensor to produce the total miles driven during a period for purposes of calculating the distance charge. After making the calculation, the specific travel data were erased. Thus, there was neither transmission nor storage of vehicle travel locations. With this

technology, Oregon DOT hoped to obviate, by design, the system's ability to track a vehicle.

By all accounts, ODOT's technology solution worked as desired by effectively limiting exposure of precise travel information. The public, however, was not persuaded. As the 2007 pilot program report observes, "Many opponents of using GPS signals for road user charging argue that this is the first step towards complete government acquisition of private travel data." In its 2007 pilot report, ODOT noticed a trust issue: "When ODOT explains its efforts to protect citizen privacy, most citizens release their anxiety but with the caveat, 'As long as it's true.'"

Oregon's second stage (2010-2015). ODOT and the RUFTF learned from the negative public and media reactions to its first distance charge pilot that a technology-solution alone would not mollify generally held privacy concerns over use of GPS data. The emphasis shifted away from a technology solution to administrative and legal solutions.

During deliberations on RUC legislation in 2010, RUFTF proposed a two-pronged strategy. First, the payers of a RUC should have the option to choose non-location-aware technology for reporting travel data, thus removing the functional ability to collect location information. Secondly, the legislature should enact legal prohibitions and data management requirements to protect personally-identifiable information held by a government agency or a private entity for the purpose of collecting a RUC.

In a second, smaller demonstration in 2012-13, with eight state legislators participating, ODOT offered the choice of location-based reporting or non-location-based reporting. The success of the second pilot led to the passage of Senate Bill 810 in 2013 enacting a voluntary, operational per-mile RUC program that included not only a non-location reporting option but also privacy protection provisions negotiated with the American Civil Liberties Union, a privacy watchdog group.

Privacy provisions of Oregon's RUC Program. Oregon's per-mile RUC program legislation requires a non-location aware distance reporting option to allow participating motorists to elect not to have their travel patterns reported. Importantly, the legislation further declares personally identifiable information as confidential and establishes a prohibition from disclosing personally identifiable information obtained to collect a RUC to anyone other than the registered owner of a vehicle subject to the RUC or those involved with collecting travel data and the charge. The law applies the nondisclosure requirement

to the authorized agency (ODOT) and certified service providers involved in collection of travel data or administration to collect the charge and limits disclosure to information necessary to fulfill the respective recipient's function in the RUC program.

The law set forth an exception to this nondisclosure prohibition for police officers pursuant to a court order based on probable cause in a criminal investigation. Another exception is for an entity expressly approved to receive the information by the registered owner or lessee of the vehicle.

The law defines personally identifiable information as "any information that identifies or describes a person." The law then lists information and data that qualify, such as travel pattern data, but indicates that the definition is not limited to that list.

The law defines certified service providers as entities that have entered into an agreement with the authorized agency (ODOT) to collect metered use data and the per-mile RUC. There is no requirement that certified service providers must come from the private sector.

Oregon's RUC privacy law requires destruction of location and daily metered use data records, a subset of personally identifiable information, not later than 30 days after completion of the later of payment processing, dispute resolution, or a noncompliance investigation. There are exceptions allowing information stripped of its identifying qualities to be aggregated and used in traffic management and research and for monthly summaries of metered use by subject vehicles.

The law authorizes a certified service provider to retain location and daily metered use data records upon obtaining the consent of the registered owner or lessee of the subject vehicle. This consent exception does not apply to the authorized agency.

ODOT added more detail to the privacy protection law by administrative rule, including definitions for the following terms,

- ▶ Personally identifiable information does not include anonymized information or anonymized aggregated information.
- ▶ Anonymized information means information that does not identify or describe a person.

- ▶ Anonymized aggregated information means aggregated information accumulated in a way that preserves the anonymity of the persons participating in the RUC program, and does not identify or describe a person or create travel pattern data.
- ▶ Travel pattern data means location and daily metered use of a subject vehicle and data that describes a person’s travel habits in sufficient detail that the person becomes identifiable either through the data itself or by combining publicly available information with the data.
- ▶ Non-compliance investigation means an investigation by the authorized agency to determine if, and to what extent, any person, including but not limited to a RUC payer, is in compliance with the statutory provisions and associated administrative rules.
- ▶ Express approval means active approval, either electronic or on paper, by a payer of RUC that identifies the entity which personally identifiable information will be shared.
- ▶ Consent means voluntary agreement given to retain location and daily metered use beyond the period required by law.

The administrative rules created the following rights for those owning or leasing a vehicle subject to the RUC with the requirement that the authorized agency and certified service provider respond to requests for exercise of these rights within five business days.

- ▶ The right to inquire about the nature, accuracy, status and use of and the right to examine the personally identifiable information or a reasonable facsimile thereof.
- ▶ The right to request correction of personally identifiable information upon provision of reasonable evidence that the information has errors or has changed.
- ▶ The right to erasure of the location and daily metered use data that has not been destroyed within the required period of time.

The following list constitutes the potentially relevant privacy protection provisions *not* included in the Oregon privacy protection law for RUC data.

1. The form that personal information must be kept.
2. The form of express approval.

3. What happens when express approval provisions are violated.
4. The right to withdraw express approval.
5. Whether a certified service provider may condition performance of duties on receiving express approval for sharing personal data with others.
6. Providing information relating to rights pertaining to personal information.
7. Providing information upon request and how the information is provided.
8. Whether consent should be required for a certified service provider to use personally identifiable information for other services beyond collection of a RUC.
9. Prohibition of discriminatory actions against persons exercising their rights.
10. Requirements for appropriate security measures.
11. Requirements for notification of a breach of security related to personally identifiable information.
12. Requirement for a certified service provider to appoint a specific person responsible for protection of personally identifiable information.
13. Establishment of certification mechanisms for certified service providers to demonstrate compliance with this privacy protection law.
14. Judicial and administrative remedies.
15. Preemption of local law.
16. Prohibition of attempts to waive this privacy protection law.
17. Requirements for anonymization of road usage charge information and data.
18. Requirements for maintaining a record of access to personally identifiable information.
19. Requirement for certified service providers to establish, publish and adhere to an internal usage and privacy policy available in writing.

California

The California Legislature passed Senate Bill 1077 in August 2014 directing the California State Transportation Agency (CalSTA) to conduct a pilot program demonstrating a system for charging by distance traveled. The legislature placed particular focus on protecting privacy during operation of the pilot program.

Statutory protection of privacy. Senate Bill 1077 declared that any exploration of RUC must take privacy implications into account and, specifically, that travel locations or patterns shall not be required to be reported to the state and, further, that technical

safeguards must protect personal information. The legislature directed empanelment of a technical advisory committee to consider the necessity of protecting all personally identifiable information used in reporting highway use to public and private agencies with an emphasis on protecting location data, to ensure protection of individual privacy rights under the California Constitution.

The legislature directed that the pilot design itself reflect privacy protection as a policy priority. The pilot program would analyze alternative means of collecting road usage data, including at least one means not reliant on electronic vehicle location data, while also collecting a minimum amount of personal information including location-aware information. To protect data integrity and safeguard privacy, the pilot would have processes for collection, management, storage, transmission, and destruction of data. The legislature directed that for all personal information or data collected during the pilot program, the state government not disclose, distribute, make available, sell, access, or provide such information for any purpose other than the pilot program, except for certain legal purposes involving a court order, subpoena, or warrant, or aggregated information, with all personal information removed, for purposes of academic research.

TAC privacy protection principles. In early 2015, the California Transportation Commission appointed the Technical Advisory Committee (TAC) to advise the California Department of Transportation on issues pertaining to a RUC pilot program, including protection of privacy. The commission appointed two individuals of prominence in the privacy protection arena to the TAC.

The importance of the protection of personal information and data generated from pilot program arose at the TAC’s first meeting. Later, in July 2015, the TAC recommended the following privacy principles for application in the pilot but also generally if an operational program implementation occurred. The TAC used these principles to develop its Road Charge Pilot Program Privacy Policy.

1. The Road Charge system must at all time recognize and respect an individual’s interests in privacy and information use pursuant to Section 1 of Article I of the California Constitution.
2. The Road Charge system must offer motorists a time-based system of paying for road use, as an alternative payment method for individuals concerned about disclosing their mileage driven.

3. The Road Charge system must allow motorists choice in how mileage will be reported.
4. The Road Charge system must be designed, implemented and administered in a manner transparent to the public and to individual motorists.
5. The Road Charge system must comply with applicable federal and state laws governing privacy and information security.
6. Personal information required for the Road Charge system must not be disclosed to any persons or entities without motorists' consent, specific statutory authority authorizing disclosure, appropriate legal process, or emergency circumstances as defined in law.
7. The Road Charge system shall not collect information beyond what is needed to properly calculate, report and collect the road charge, unless the motorist provides his or her consent.
8. Road Charge system data retained beyond the period of time necessary to ensure proper mileage account payment must have all personal information removed, and may only be used for public purposes (i.e., improve the safety and efficiency of the traveling public).
9. Motorists who choose to release personal information must provide their consent in a clear, unambiguous and written manner.
10. The Road Charge system must not require use of specific locational information, including specific origins or destinations, travel patterns or times of travel.
11. The Road Charge system must allow motorists an opportunity to view all personal data being collected and stored to ensure only data required for proper accounting and payment of road charges is being collected and retained.
12. The Road Charge system must investigate all potential errors identified by motorists and make all corrections to ensure road charge records remain accurate.

California pilot program privacy protection

The California Road Charge Pilot Program (2016-17) operationalized the California Road Charge Privacy Principles. The state made evident its commitment to the privacy principles by declaring adherence to them in the pilot program participant agreement and

including them as an attachment. Throughout the operation of the nine-month Road Charge Pilot Program, the state adhered to the privacy protections and, at the conclusion of the pilot, destroyed data in accordance with its requirements. The authorized agency also fulfilled several requests for aggregate pilot data in accordance with both state law (Senate Bill 1077) and the adopted principles.

Washington: the WA RUC Pilot Program privacy protection

For the Washington Road Usage Charge Pilot Program (2018), the Washington Transportation Commission applied a privacy policy similar to the one applied in California but identifying the personal information that would be collected and protected as well as limiting scope for which the personal information would be applied. This privacy policy offered the right for participants to inspect their information and records and prompt corrections and provide that location-aware reporting and services are optional.

APPENDIX D: GENERAL PRIVACY PROTECTION LAWS

I. United States

As stated above, the United States does not have any general privacy protection law at the federal level except for an inference in the U.S. Constitution stated in case law of the Supreme Court determined on a case-by-case basis and therefore not specific.

Residents of a state cannot rely upon Supreme Court case law to understand how information and data obtained during collection of a RUC will be protected. To reassure residents of a state on this issue, a state legislature or Congress must enact a statute.

State law

Absent a federal directive for general protection of privacy data and information, any policy enactments protecting privacy for road usage charge data must come from the states.

According to the National Conference of State Legislatures, only ten states have provisions in their state constitutions directly protecting privacy.

- ▶ Alaska: The right of the people to privacy is recognized and shall not be infringed. Article I, section 22.
- ▶ Arizona: No person shall be disturbed in his private affairs, or his home invaded, without authority of law. Article II, section 8.
- ▶ California: All people are by nature free and independent and have inalienable rights. Among these are ... pursuing and obtaining ... privacy. Article I, section 1.
- ▶ Florida: Every natural person has the right to be let alone and free from governmental intrusion into the person's private life ... Article I, section 23.
- ▶ Hawaii: The right of the people to privacy is recognized and shall not be infringed without the showing of a compelling state interest. And further, the right of the people to be secure in their persons, houses, papers and effects against unreasonable searches, seizures and invasions of privacy shall not be violated ... Article I, sections 6 and 7.
- ▶ Illinois: The people shall have the right to be secure in their persons, houses, papers and other possessions against unreasonable searches of privacy or

interceptions of communications by eavesdropping devices or other means. Article I, section 6.

- ▶ Louisiana: Every person shall be secure in his person, property, communications, houses, papers, and effects against unreasonable searches or invasions of privacy. Article I, section 5.
- ▶ Montana: The right of individual privacy is essential to the well-being of a free society and shall not be infringed without the showing of a compelling state interest. Article II, section 10.
- ▶ South Carolina: The right of the people in their persons, houses, papers, and effects against unreasonable searches and seizures and unreasonable invasions of privacy shall not be violated ... Article I, section 10.
- ▶ **Washington: No person shall be disturbed in his private affairs, or his home invaded, without authority of law. Article I, section 7.**

These constitutional provisions apply to government action. Whether the protections in these state constitutions extend to actions of non-governmental entities holding personal data or information is unknown. Also unknown are any duties inferred from these protections. For any legal certainty about the protection of privacy, state legislatures must enact legislation.

For example, the California Legislative Assembly augmented the state’s constitutional privacy protection provision by enactment of the California Consumer Privacy Act and approval by the state’s governor on June 28, 2018. The California Consumer Privacy Law primarily focuses on imposing requirements on businesses and rights to consumers with respect to consumer data rather than restricting or directing the actions of government.

The California privacy law grants consumers a right to disclosure of personal information that a business collects about the consumer, the sources from which it came, the purposes for collecting or selling the information, and the categories of third parties with which the information is shared. Specifically, the law, among other things, does the following:

- ▶ Right to disclosure. Grants a consumer a right to request disclosure of the categories and specific pieces of personal information that a business collects about the consumer, the categories of sources from which that

information is collected and requires a business to disclose the information and the purposes for which it is used.

- ▶ Right to deletion. Grants a consumer the right to request deletion of personal information and requires the business to delete upon receipt of a verified request.
- ▶ Rights when personal information is sold. Grants a consumer a right to request that a business that sells the consumer’s personal information, or discloses it for a business purpose, disclose the categories of information that it collects and categories of information and the identity of 3rd parties to which the information was sold or disclosed and requires a business to provide this information in response to a verifiable consumer request.
- ▶ Right to opt out. Authorizes a consumer to opt out of the sale of personal information by a business and prohibits the business from discriminating against the consumer for exercising this right, including by charging the consumer who opts out a different price or providing the consumer a different quality of goods or services, except if the difference is reasonably related to value provided by the consumer’s data.
- ▶ Prohibits selling personal information of consumer under age 16. Prohibits a business from selling the personal information of a consumer under 16 years of age, unless affirmatively authorized, as specified, to be referred to as the right to opt in.
- ▶ Consumer requests. Prescribes requirements for receiving, processing, and satisfying requests from consumers.
- ▶ Personal information definition. Defines “personal information” with reference to a broad list of characteristics and behaviors, personal and commercial, as well as inferences drawn from this information.
- ▶ Prohibits restriction of compliance. Prohibits restriction of the ability of the business to comply with federal, state, or local laws, among other things.
- ▶ Enforcement. Provides for its enforcement by the Attorney General and provides a private right of action in connection with certain unauthorized access and exfiltration, theft, or disclosure of a consumer’s non-encrypted or non-redacted personal information.
- ▶ Attorney General opinion on compliance. Authorizes a business, service provider, or 3rd party to seek the Attorney General’s opinion on how to comply with its provisions.

- ▶ Voids waiver. Voids a waiver of a consumer’s rights under its provisions.
- ▶ Takes effect on January 1, 2020.

II. European Union General Data Protection Regulation (2018)

One month before the California Consumer Privacy Act was approved, the European Union implemented the General Data Protection Regulation (GDPR) on May 25, 2018. The stated purposes of the GDPR are (1) protection of fundamental rights and freedoms of natural persons regarding the processing of their personal data and their right to protection of personal data, and (2) free movement of personal data within the European Union.

The comprehensiveness and reach of the EU’s GDPR renders this regulation relevant for consideration in development of a model privacy policy framework for distance charging in the United States. The EU’s GDPR is far-reaching and covers some data processing not relevant to a distance charge enacted in the United States. As such, the following description of the essential GDPR provisions only summarizes some of the potentially relevant portions of the regulation.

Description of EU GDPR essential provisions

The GDPR protects personal data which means information related to identified or identifiable natural person. The GDPR applies to the processing of personal data by a controller or processor, wholly or partially by automated means (or, other means, if part of a filing system), where activities relate to the offering of goods or services irrespective of payment. A controller means a natural or legal person which determines the purposes and means of processing personal data. A processor means a natural or legal person which possesses personal data on behalf of the controller.

This regulation establishes principles for processing of personal data. These principles require that personal data shall be

- ▶ Processed lawfully, fairly and in a transparent manner;
- ▶ Collected and processed only for specified, explicit and legitimate purposes;
- ▶ Adequate, relevant and limited to the purposes;
- ▶ Accurate and kept up to date and, if not, erased;
- ▶ Kept in a form which permits identification of data subjects no longer than necessary for the purposes; except that personal data may be kept for

longer periods for archiving in the public interest, scientific or historical research or statistical purposes subject to storage limitation; and

- ▶ Processed in a manner that ensures appropriate security of personal data, using appropriate technical or organizational measure.

The controller is responsible for compliance with these principles.

Data processing is considered lawful when the data subject has given consent to processing of personal data for specific purpose(s) and processing is necessary for:

- ▶ performance of the agreement;
- ▶ compliance with a legal obligation;
- ▶ protect vital interests of data subject or natural person;
- ▶ performance of task in the public interest; and
- ▶ legitimate interests pursued by controller (but not public authorities), except where overridden by interests of fundamental rights and freedoms of data subject.

Consent of the data subject means any freely given, specific, informed and unambiguous indication of the data subject's wishes by a statement or clear affirmative action signifies agreement to the processing of personal data related to the data subject. If in writing, the request for consent must be clearly distinguishable, intelligible and easily accessible in clear and plain language. If this provision is infringed, the consent will not be binding.

Data subject has right to withdraw consent at any time. Withdrawal of consent shall not affect lawfulness of consent given before withdrawal provided data subject was informed thereof. It shall be as easy to withdraw as give consent.

The GDPR established many rights for the data subject.

- ▶ Transparency of information related to rights. The controller shall provide information related to rights pertaining to personal data in writing, or where appropriate, by electronic means, in a concise, transparent, intelligible and easily accessible form, using clear and plain language. The controller shall facilitate the exercise of these rights and shall not refuse to act upon the request of a data subject unless the controller demonstrates an inability to identify the data subject. The controller shall provide information upon a

request for exercise of rights pertaining to personal data without undue delay and no longer than one month or receipt of request. Where request is made by electronic means, the information can be provided by electronic means. The information may be provided orally if requested by the data subject.

- ▶ Providing information related to identity and purpose. When personal data related to a data subject are obtained, the controller shall provide the data subject with the following information free of charge:
 - > Identity and contact details of the controller;
 - > Contact details of the data protection officer;
 - > Purposes of and legal basis for the personal data processing;
 - > Any legitimate interests pursued by the controller or third parties in collecting the personal data
 - > Recipients, or categories of recipients, of the personal data, if any,
 - > Whether the controller intends to transfer personal data internationally and reference to suitable safeguards and the means to obtain copy of them.
- ▶ Providing information related to personal information. At the time when personal data are obtained from the data subject, the controller shall provide the data subject the following information free of charge and in standard icons to give in an easily visible, intelligible and clearly legible manner, to ensure fair and transparent processing:
 - > The period of storage or criteria to determine that period;
 - > Existence of the right to request access to and rectification or erasure of personal data or restriction of processing or object to processing and the right to portability;
 - > The existence of right to withdraw consent at any time without affecting the lawfulness of the processing on the prior consent;
 - > The right to lodge a complaint with a supervisory authority;
 - > Whether the provision of personal data is a statutory or contractual requirement, or necessary to enter into a contract, and whether the data subject is obliged to provide personal data and possible consequences of failure to do so;
 - > The existence of automated decision-making, including profiling, and meaningful information related to it.

- ▶ Right of access to personal information. The data subject has the right to obtain confirmation from controller as to whether his/her personal data is being processed and access to that data and the following:
 - > Purposes of the processing;
 - > Categories of personal data concerned;
 - > Recipients, or categories of recipients, of the personal data, if any,
 - > The envisaged period for which the personal data will be stored or the criteria for determining that period
 - > Existence of the right to request from the controller rectification or erasure of personal data or restriction of processing of the personal data;
 - > The right to lodge a third-party complaint with a supervising authority;
 - > Where personal data are not collected from the data subject, any available information on the source;
 - > The existence of automated decision-making, including profiling, and meaningful information related to it.
- ▶ Right to rectification. The data subject has the right to rectification of inaccurate personal data without undue delay or to have incomplete personal data completed.
- ▶ Right to erasure (right to be forgotten). The data subject has the right to erasure of personal data without undue delay and the controller has the obligation to erase personal data without undue delay where one of the following grounds applies:
 - > The personal data are no longer necessary for the purpose of the collection;
 - > The data subject withdraws consent on which processing is based;
 - > The personal data have been unlawfully processed;
 - > Compliance with a legal obligation is necessary;
 - > Personal data were collected for information society services.

The right of erasure shall not apply to the extent processing is necessary:

- ▶ For exercising right of freedom of expression and information;
- ▶ Compliance with a legal obligation;
- ▶ Reasons of public interest in public health;
- ▶ Archiving purposes in the public interest, scientific, historical or statistical purposes;

- ▶ Establishment, exercise or defense of legal claims.

Notification obligation. Controller shall communicate any rectification or erasure of personal data or restriction of processing to each recipient to which personal data were disclosed and inform data subject about recipients, if requested.

- ▶ Right to portability. The data subject has right to receive personal data provided to a controller in a structured, commonly used and machine-readable format and has the right to transmit those data to another controller without hindrance where:
 - > Processing is based on consent;
 - > Processing is carried out by automated means.
- ▶ Right to object. Data subject shall have right to object at any time to processing of personal data which is based on carrying out a task in the public interest or exercise of controller's official authority or pursuits of legitimate interests. Controller shall no longer process the personal data unless controller demonstrates compelling legitimate grounds for processing sufficient to override interests, rights and freedoms of data subject or for establishment, exercise or defense of legal claims. Data subject shall have the right at any time to object to use of personal data for direct marketing purposes, including profiling, and those data will no longer be used for those purposes.

Security. The controller shall implement appropriate technical and organizational measures to ensure a level of security appropriate to the risk of destruction, loss, alteration, unauthorized disclosure of or access to personal data, including the following:

- ▶ Pseudonymization and encryption of personal data;
- ▶ Ability to ensure ongoing confidentiality, integrity, availability and resilience of processing systems and services;
- ▶ Ability to restore availability and access to personal data in a timely manner in event of an incident.

Data Protection Officer. The GDPR established a regimen for management of data processing of personal information and rights of the data subject. Within the regimen is designation of a data protection officer by the controller and processor in any case where:

- ▶ Processing is carried out by public authority or body;
- ▶ Core activities of controller or processor consist of processing operations which, by their nature, require regular and systematic monitoring of data subjects;
- ▶ Core activities of control or processor consist of processing on a large scale of special categories of data relating to racial or ethnic origin, public opinions, religious or philosophical beliefs, trade union membership, and processing of genetic data or biometric data or uniquely identifying a person, data concerning health or data concerning a natural person's sex life or sexual orientation or personal data relating to criminal convictions or offenses.

The GDRP assigns special tasks for the data protection officer.

Remedies. The GDPR establishes many rights and remedies pertaining to violations.

- ▶ Right to lodge complaint with a supervisory authority;
- ▶ Right to effective judicial remedies;
- ▶ Representation of data subject.
- ▶ Rights to compensation and liability.
- ▶ Administrative fines.
- ▶ Penalties. Development of privacy protection policies for U.S. RUC programs

APPENDIX E: COMPARISON OF SELECTED PRIVACY LAWS WITH MODEL PRIVACY POLICY

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OREGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
I. GENERAL PROVISIONS				
Stated Purpose	Protection of fundamental rights and freedoms of natural persons with regard to processing of personal data and their right to protection of their personal data and the free movement of personal data within the EU. A1.1.2.3.	To further the right of privacy in the California Constitution and to supplement existing laws relating to consumer's personal information by giving consumers an effective way to control their personal information. Section 3, 1798.175.	A specific purpose is not stated but the statute implies that its purpose is protection of personally identifiable information related to collection of a per-mile road usage charge from disclosure. ORS 319.915.	The is law protects personal information related to collection of per-mile road usage charges from disclosure. A Road Usage Charge Program is a statutory program, supported by administrative rules, for collecting road usage charges for metered use of a subject vehicle on the highways of the state.
Protected data	Personal data means information related to an identified or identifiable natural person, a " data subject. " A4(1).	Personal information means information that identifies, relates to, describes, is capable of being associated with, or could reasonably be linked, directly or indirectly with a particular consumer or household, including the following: <ul style="list-style-type: none"> Identifiers such as a real name, alias, postal address, unique personal identifier, online identifier Internet Protocol address, email address, account name, social security number, driver's license number, passport number, or other similar identifiers; Any categories of personal information that identifies, relates to, describes, or is capable of being associated with, a particular individual, including, but not limited to, his or her name, signature, social security number, physical characteristics or description, address, telephone number, passport number, drivers license or state identification card number, insurance policy number, education, employment, employment history, bank account number, credit card 	Personally identifiable information means information that identifies or describes a person that is obtained or developed in the course of reporting metered use by a subject vehicle or for providing administrative services related to the collection of road usage charges, 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 but does not include anonymized information or anonymized aggregated information. ORS 319.915(1)(b); OAR 731-090-0010(23). Anonymized information means information that does not identify or	Personal information means information or data that identifies, relates to or describes a person that is obtained or developed in the course of reporting metered use by a subject vehicle or for providing administrative services related to the collection of road usage charges. Personal information does not include anonymized aggregated information. Anonymized information means information that cannot reasonably

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	<p>number, debit card number, or any other financial information, medical information, or health insurance information. Personal information does not include publicly available information that is lawfully made available to the general public from federal, state, or local government records;</p> <ul style="list-style-type: none"> • Characteristics of protected classification under California or federal law; • Commercial information, including records of personal property, products of services purchased, obtained, or considered, or other purchasing or consuming histories or tendencies; • Biometric information; • Internet or other electronic network activity information, including browsing history, search history, and information regarding a consumer's interaction with an Internet Web site, application, or advertisement; • Geolocation data; • Audio, electronic, visual, thermal, olfactory, or similar information; • Professional or employment-related information; • Education information, defined as information that is not publicly available personally identifiable information; • Inferences drawn from any of the information identified to create a profile about a consumer reflecting the consumer's preferences, characteristics, psychological trends, preferences, predispositions, behavior, attitudes, intelligence, abilities, and aptitudes. <p>Section 3, 1798.140(o)(1).</p> <p>Personal information does not include publicly available information that is lawfully made available from federal, state, or local government records. Information is not publicly available if,</p>	<p>describe a person. OAR 731-090-0010(2).</p> <p>Anonymized aggregated information means aggregated information accumulated in a way that preserves the anonymity of the persons participating in the Road Usage Charge Program, and does not identify or describe a person or create travel pattern data. OAR 731-090-0010(3).</p> <p>Travel pattern data means location and daily metered use of a subject vehicle and data that describes a person's travel habits in sufficient detail that the person becomes identifiable either through the data itself or by combining publicly available information with the data. OAR 731-090-0010(32).</p>	<p>identify, relate to, describe, be capable of being associated with, or be linked, directly or indirectly, to a particular person, provided a service provider has implemented technical safeguards and processes that prohibit re-identification of the person, processes that prevent inadvertent release of the information and makes no attempt to re-identify the information.</p> <p>Anonymized aggregated information means aggregated information accumulated in a way that preserves the anonymity of the persons reporting metered use by a subject vehicle related to collection of a road usage charge and does not identify or describe a person or create travel pattern data.</p> <p>Travel pattern data means location and daily metered use data of a subject vehicle and data that describes a person's travel habits in sufficient detail that the person becomes identifiable either through the data itself or by combining publicly available information with the data.</p>

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	<ul style="list-style-type: none"> • it is biometric information collected by a business about a consumer without the consumer's knowledge; • data is used for a purpose that is not compatible with the purpose for which the date is maintained and made available in the government records or for which it is publicly maintained; • consumer information that is de-identified or aggregate consumer information. Section 3, 1798.140(o)(2). <p>Aggregate consumer information means information that relates to a group or category of consumers, from which individual consumer identities have been removed, that is not linked or reasonably linkable to any consumer or household, including via a device but does not mean one or more individual consumer records that have been deidentified. Section 3, 1798.140(a).</p> <p>A device means physical object that is capable of connecting to the Internet, directly or indirectly, or to another device. Section 3, 1798.140(j).</p> <p>Deidentified means information that cannot reasonably identify, relate to, describe, be capable of being associated with, or be linked, directly or indirectly, to a particular consumer, provided a business has implemented technical safeguards and processes that prohibit reidentification of the consumer, processes that prevent inadvertent release of deidentified information and makes no attempt to reidentify the information. Section 3, 1798.140(h).</p> <p>Unique identifier or unique personal identifier means a persistent identifier that can be used to recognize a consumer, a family, or a device that is linked to a consumer or family, over time and across different services,</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	<p>including, but not limited to, a device identifier; an Internet Protocol address; cookies, beacons, pixel tags, mobile ad identifiers, or similar technology; customer number, unique pseudonym, or user alias; telephone numbers, or other forms of persistent or probabilistic identifiers that can be used to identify a particular consumer or device. Section 3, 1798.140(x).</p> <p>Probabilistic identifier means the identification of a consumer or a device to a degree of certainty of more probable than not based on any categories of personal information included in, or similar to, the categories enumerated in the definition of personal information. Section 3, 1798.140(p).</p>		
<p>Material Scope Applies to the processing of personal data wholly or partly by automated means or other means if part of a filing system. A2.1.2.3.4.</p> <p>Processing means any operation or set of operations performed on personal data or on sets of personal data, whether or not by automated means, such as collecting, recording, organization, structuring, storage, adaptation, alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment, combination, restriction, erasure or destruction. A4(2).</p> <p>A filing system means any structured set of personal data which are accessible according to specific criteria. A4(6).</p>	<p>Applies to the ability of individuals to control the use, including the sale, of their personal information. Section 2(a).</p> <p>Processing means any operation or set of operations that are performed on personal data or on sets of personal data, whether or not by automated means. Section 3, 1798.140(q).</p>	<p>The registered owner or lessee of a subject vehicle shall report the metered use by that vehicle and pay the per-mile road usage charge due for metered use of the highways in the state. ORS 319.885(1)(a)(b) & ORS 319.920(1).</p> <p>Registered owner means a person, other than a vehicle dealer, that is required to register a motor vehicle in Oregon. ORS 319.883(4).</p> <p>Lessee means a person that leases a motor vehicle that is required to be registered in Oregon. ORS 319.883(2)</p> <p>Subject vehicle means a motor vehicle that is the subject of an application to volunteer to pay the per-mile road usage charge for metered use by the vehicle. ORS 319.883(5).</p>	<p>This policy applies to processing of personal information reported by a registered owner or lessee wholly or partly by automated or other means for purposes of paying a per-mile road usage charge for metered use by a subject vehicle of the highways of the state.</p> <p>Processing means any operation or set of operations that are performed on personal data or on sets of personal data, whether or not by automated means.</p> <p>Registered owner means a person, other than a vehicle dealer, that is required to register a motor vehicle in the state.</p> <p>Lessee means a person that leases a motor vehicle that is required to be registered in the state.</p>

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Territorial Scope Applies to the processing of personal data by a controller or processor, whether established in the EU or not, where activities relate to the offering of goods or services irrespective of payment. A3.1.2.3.</p> <p>A controller means the natural or legal person, public authority, agency or other body which determines, either alone or jointly, the purposes and means of processing personal data. A4(7)</p> <p>A processor means a natural or legal person, public authority, agency or other body which processes personal data on behalf of a controller. A4(8).</p>	<p>It is the intent of the state legislature to further Californian’s right to privacy by giving consumers an effective way to control their persona information. Section 2(i).</p>	<p>Applies to personally identifiable information used for reporting metered use of subject vehicles on the highways of the state of Oregon or for administrative services related to the collection of the per-mile road usage charge established in Oregon. ORS 319.915(2).</p>	<p>Subject vehicle means a motor vehicle that is the subject of an application to volunteer to pay the per-mile road usage charge for metered use by the vehicle.</p> <p>This policy applies to the processing of personal information by a commercial or government entity, whether established in the state or not, where activities relate to collection of a per-mile road usage charge irrespective of payment.</p>
<p>II.PRINCIPLES</p>			
<p>Principles related to processing of personal data</p>	<p>Personal data shall be: a: Processed lawfully, fairly and in a transparent manner; b: Collected and processed only for specified, explicit and legitimate purposes; c: Adequate, relevant and limited to the purposes; d: Accurate and kept up to date and, if not, erased; e: Kept in a form which permits identification of data subjects no longer than necessary for the purposes; except that personal data may be kept for longer periods for archiving in the public interest,</p>	<p>Personally identifiable information used for reporting metered use or for administrative services related to the collection of the per-mile road usage charge is confidential and is a public record exempt from disclosure. ORS 319.915(2).</p> <p>The DOT or 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 collection of per-mile road usage charges to any person, except:</p>	<p><i>[If a state’s public records laws grant public access to driving records,]</i> personal information used for reporting metered use or for administrative services related to the collection of the per-mile road usage charge is confidential and is a public record exempt from disclosure.</p> <p>Information collected for use in a Road Usage Charge Program shall be accurate, relevant and collected and processed in a transparent manner only for use in collecting a per-mile road usage charge from a registered owner of lessee of a subject vehicle. The personal</p>

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>scientific or historical research or statistical purposes subject to storage limitation; f. Processed in a manner that ensures appropriate security of personal data, using appropriate technical or organizational measure. A5.1.</p> <p>The controller shall be responsible for compliance with the above principles. The controller is the natural or legal person, public authority, agency or other body which determines the purposes and means of processing personal data. A5.2; A4(7)</p>	<p>Disclosure of personally identifiable information is limited to the information necessary to the respective recipient's function in regard to collection of per-mile road usage charges. ORS 319.915(3)(b).</p>	<ul style="list-style-type: none"> • the registered owner or lessee; • a financial institution, for the purpose of collecting per-mile road usage chargers owed; • employees of the DOT; • a certified service provider; • a contractor for a certified service provider, but only to the extent the contractor provides services directly related to an agreement with the DOT; • an entity expressly approved to receive the information by the registered owner or lessee of the subject vehicle; • 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 the person to who the requested information pertains. ORS 319.915(3)(a). <p>Disclosure of personally identifiable information is limited to the information necessary to the respective recipient's function in regard to collection of per-mile road usage charges. ORS 319.915(3)(b).</p>	<p>information shall be kept in a form which permits identification of the subject vehicle and its registered owner of lessee no longer than necessary and processed in a manner that ensures appropriate security, using appropriate technical or organizational measures.</p> <p>No person or entity involved with collection of a per-mile road usage charge may disclose personal information used of developed for reporting metered use by a subject vehicle or for administrative services related to collection of per-mile road usage charges to any person, except to the following recipients limited to the information necessary to the respective recipient's function in collecting per-mile road usage charges:</p> <ul style="list-style-type: none"> • the registered owner or lessee; • a financial institution, for the purpose of collecting per-mile road usage chargers owed; • employees of the DOT; • a service provider; • a contractor for a service provider, but only to the extent the contractor provides services directly related to an agreement with the DOT; • an entity expressly approved to receive the information by the registered owner or lessee of the subject vehicle; • 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 the person to who the requested information pertains.

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
			<p>An authorized agency or service provider that accesses or provides access to personal information shall maintain a record of that access. The access control log shall include:</p> <ul style="list-style-type: none"> • Date and time the information is accessed; • The data elements used to query the road usage charge database or system; • The person accessing the personal information; • The purpose for accessing the information.
	<p>A service provider means a sole proprietorship, partnership, limited liability company, corporation, association, or other legal entity that is organized or operated for the profit or financial benefit of its shareholders or other owners, that processes information on behalf of a business and to which the business discloses a consumer's personal information for a business purpose pursuant to a written contract, provided that the contract prohibits the entity receiving the information from retaining, using, or disclosing the personal information for any purpose other than for the specific purpose of performing the services specified in the contract for the business, or as otherwise permitted by this title, including retaining, using, or disclosing the personal information for a commercial purpose other than providing the services specified in the contract with the business. Section 3, 1798.140(v).</p>	<p>A certified service provider means an entity that has entered into an agreement with the DOT 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. ORS 319.915(1)(a).</p>	<p>A service provider means an entity that has entered into an agreement with the authorized agency 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. The state should appoint a state agency to act as a service provider as an alternative to contracted service providers.</p>
		<p>Express approval means active approval, either electronic or on paper, by a payer of road usage charges that identifies the entity which personally identifiable information will be shared. OAR 731-090-0010(9).</p>	<p>Express approval means active approval, either electronic or on paper, by a payer of road usage charges that identifies the entity which personal information will be shared. The request for express approval must be clearly distinguishable, intelligible and easily accessible in clear and plain language. If</p>

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
			<p>this provision is infringed, the express approval will not be binding.</p> <p>The person providing personal information has right to withdraw express approval at any time. Withdrawal of express approval shall not affect lawfulness of express approval given before withdrawal provided the person was informed thereof. It shall be as easy to withdraw as give express approval.</p> <p>Authorized agency means a government agency assigned the responsibility and given the authority to implement and operate the Road Usage Charge Program.</p>
<p>Principles for lawful processing of data</p> <p>Data processing is lawful when the data subject has given consent to processing of personal data for specific purpose(s) and processing is necessary for:</p> <ul style="list-style-type: none"> • performance of the agreement; • compliance with a legal obligation; • protect vital interests of data subject or natural person; - performance of <i>task</i> in the public interest; • legitimate interests pursued by controller (but not public authorities), except where overridden by interests of fundamental rights and freedoms of data subject. A6.1. <p>The basis for processing shall be determined by law or by necessity in performance of a task carried out in the public interest or the exercise of official authority vested in the controller. A6.3.</p>			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Consent of the data subject means any freely given, specific, informed and unambiguous indication of the data subject’s wishes by a statement or clear affirmative action signifies agreement to the processing of personal data related to the data subject. A3(11).</p>			<p>Consent means any freely given, specific, informed and unambiguous indication by a registered owner or lessee of a subject vehicle by a clear affirmative action to select a mileage reporting method signifies agreement to collection and processing of metered use data for use in assessing a per-mile road usage charge.</p>
<p>Where processing is not based on the data subject’s consent or on EU or member state law, controller shall take into account:</p> <ul style="list-style-type: none"> (a) any link between purposes for gathering personal data and purposes for intended further processing; (b) context for collection of personal data, in particular relationship between data subjects and controller; (c) nature of personal data; (d) possible consequences of further processing; (e) existence of appropriate safeguards, including encryption or pseudonymization. A6.4. <p>Pseudonymization means processing of personal data in such a manner that the personal data can no longer be attributed to specific data subject without additional information. A3(5).</p>	<p>Pseudonymize or pseudonymization means the processing of personal information in a manner that renders the personal information no longer attributable to a specific consumer without the use of additional information, provided that the additional information is kept separately and is subject to technical and organizational measures to ensure that the personal information is not attributed to an identified or identifiable consumer. Section 3, 1798.140(r).</p>		
<p>Principles: conditions for consent</p>	<p>For processing based on consent, controller must be able to demonstrate consent to processing of personal data was granted by data subject. A7.1.</p>		
<p>If consent is written, the request for consent must be clearly distinguishable, intelligible and easily</p>			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
accessible in clear and plain language. If this provision is infringed, the consent will not be binding. A7.1.2.			
Data subject has right to withdraw consent at any time. Withdrawal of consent shall not affect lawfulness of consent given before withdrawal provided data subject was informed thereof. It shall be as easy to withdraw as give consent. A7.3.			Data subject has right to withdraw consent at any time. Withdrawal of consent shall not affect lawfulness of consent given before withdrawal provided data subject was informed thereof. It shall be as easy to withdraw as give consent.
When assessing whether consent was freely given, utmost account shall be taken of whether performance of the contract is conditional on consent to processing of personal data that is not necessary to contract performance. A7.4.			
Principles: conditions applicable to child's consent	This law applies to processing of data for children at least 16 years old. A8.1.2.3.		
Principles: processing of special categories of personal data	Prohibits processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership or genetic data, biometric data of uniquely identifying a natural person, data concerning health or data concerning a natural person's sex life or sexual orientation. A9.1.		
Exceptions: if, <ul style="list-style-type: none"> • explicit consent is given for data processing for specified purposes; • processing is necessary under employment, social security and social protection law; 			

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<ul style="list-style-type: none"> • processing is necessary to protect vital interests of data subject or natural person where physically or legally incapable of giving consent; • processing is carried out for members of political, philosophical, religious or trade union if consent is given; • processing relates to personal data manifestly made public by data subject; • processing is necessary for establishment, exercise or defense of legal claims; processing is necessary for reasons for reasons of substantial public interest proportionate to the aim pursued, provided there are safeguards of fundamental rights and interests of the data subject; • processing is necessary for purposes of preventative or occupational medicine; • processing is necessary for reasons of public interest in the area of public health; • processing is necessary for archiving purposes in the public interest. A9.2. 			
<p>Processing of revealing personal data is permissible under responsibility of a professional subject to the obligation of professional secrecy. A9.3.</p>			
<p>Member states are allowed to establish further conditions and limitations with regard to processing genetic data, biometric data or data concerning health. A9.4.</p>			

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Principles: processing of personal data related to criminal convictions and offenses	Processing of personal data related to criminal convictions of offenses shall be carried out only under the control of an official authority. A10.			
Principles: processing not requiring identification	If the purposes for processing personal data do not (or no longer) require identification of a data subject, the controller shall not be obliged to maintain, acquire or process additional information in order to identify the data subject to comply with the GDPR. If the controller is able to demonstrate this non-obligation, the controller shall inform the data subject of this accordingly and the rights of rectification, erasure, restriction of processing, and notification thereof, and portability do not apply. A11.			
III. RIGHTS OF THE DATA SUBJECT				
Rights: transparency and modalities	The controller shall provide information related to rights pertaining to personal data in writing, or where appropriate, by electronic means, in a concise, transparent, intelligible and easily accessible form, using clear and plain language, in particular for any information addressed specifically to a child. The information may be provided orally if requested by the data subject. A12.1.		The service provider shall provide information related to rights pertaining to personal information in writing, or where appropriate, by electronic means, in a concise, transparent, intelligible and easily accessible form, using clear and plain language. The information may be provided orally if requested by the data subject.	
	The controller shall facilitate the exercise of these rights and shall not refuse to act upon the request of a data subject unless the controller demonstrates an inability to identify the data subject. A12.2.3.		The service provider shall facilitate the exercise of these rights and shall not refuse to act upon the request of a distance charge payer.	

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>The controller shall provide information upon a request for exercise of rights pertaining to personal data without undue delay and no longer than one month or receipt of request. Period may be extended for up to two months taking into account complexity and number of requests provided controller informs data subject of the extension within one month of receipt of request along with reasons for the delay. Where request is made by electronic means, the information can be provided by electronic means. A12.3.</p>			<p>The service provider shall provide information upon a request for exercise of rights pertaining to personal information without undue delay and no longer than one month or receipt of request. Where request is made by electronic means, the information can be provided by electronic means.</p>
<p>If controller does not take action on the request of the data subject, the controller shall inform the data subject without delay but no later than one month after receipt of the request of the reasons for not taking action and the possibility for lodging a complaint with a supervisory authority and seeking judicial remedy. A12.4.</p> <p>A supervisory authority means an independent public authority established by a member state of the EU pursuant to Article 51. A3(21).</p>			<p>If service provider does not take action on the request of the distance charge payer, the controller shall inform the distance charge payer without delay but no later than one month after receipt of the request of the reasons for not taking action and the possibility for lodging a complaint with a supervisory authority and seeking judicial remedy.</p>
<p>Where controller has reasonable doubts concerning the identify of a natural person making the request pertaining to personal information, the controller may request additional information necessary to confirm identity of the data subject. A12.6.</p>			
<p>Information and access to personal data</p>			
<p>Rights: information to be provided where</p>	<p>When personal data related to a data subject are obtained, the controller</p>		<p>When personal information related to a distance charge payer are obtained, the service provider shall provide the</p>

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>personal data are collected from data subject</p>	<p>shall provide the data subject with the following information free of charge:</p> <ul style="list-style-type: none"> • identity and contact details of the controller; • contact details of the data protection officer; • purposes of and legal basis for the personal data processing; • any legitimate interests pursued by the controller or third parties in collecting the personal data • recipients, or categories of recipients, of the personal data, if any, • whether the controller intends to transfer personal data internationally and reference to suitable safeguards and the means to obtain copy of them. <p>Where requests are manifestly unfounded or excessive, the controller may charge a reasonable fee taking into account administrative costs or refuse to act on the request.</p> <p>A13.1; A12.5.</p>			<p>distance charge payer with the following information free of charge:</p> <ul style="list-style-type: none"> • identity and contact details of the service provider; • contact details of the data protection officer; • purposes of and legal basis for the personal data processing; • any legitimate interests pursued by the controller or third parties in collecting the personal data • recipients, or categories of recipients, of the personal data, if any.
	<p>At the time when personal data are obtained from the data subject, the controller shall provide the data subject the following information free of charge (unless the requests is unfounded or excessive and demonstrated by the controller) and in standard icons to give in an easily visible, intelligible and clearly legible manner, to ensure fair and transparent processing:</p> <ul style="list-style-type: none"> • the period of storage or criteria to determine that period; • existence of the right to request access to and rectification or erasure of personal data or restriction of processing or 			<p>At the time when personal information are obtained from the distance charge payer, the controller shall provide the distance charge payer the following information free of charge and in standard icons to give in an easily visible, intelligible and clearly legible manner, to ensure fair and transparent processing:</p> <ul style="list-style-type: none"> • the period of storage or criteria to determine that period; • existence of the right to request access to and rectification or erasure of personal data or restriction of processing or object to processing and the right to portability;

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<p>object to processing and the right to portability;</p> <ul style="list-style-type: none"> the existence of right to withdraw consent at any time without affecting the lawfulness of the processing on the prior consent; the right to lodge a complaint with a supervisory authority; whether the provision of personal data is a statutory or contractual requirement, or necessary to enter into a contract, and whether the data subject is obliged to provide personal data and possible consequences of failure to do so; the existence of automated decision-making, including profiling, and meaningful information related to it. A13.2. 			<ul style="list-style-type: none"> the existence of right to withdraw consent or express approval at any time without affecting the lawfulness of the processing on the prior consent; the right to lodge a complaint with the DOT; whether the provision of personal information is a statutory or contractual requirement, or necessary to enter into a contract, and whether the distance charge payer is obliged to provide personal data and possible consequences of failure to do so.
<p>Where the controller intends to further process personal data for another purpose, the controller shall provide the data subject prior to the further processing with information on that other purpose and other relevant information. A13.3.</p>			
<p>The rights above do not apply where the data subject already has the information. A13.4.</p>			
<p>Rights: Information to be provided where personal data <u>not</u> obtained from data subject</p> <p>Where personal data have not been obtained from the data subject, the controller shall provide the data subject with the following information;</p> <ul style="list-style-type: none"> identity and contact details of the controller; contact details of the data protection officer; purposes of and legal basis for the personal data processing; 	<p>For a business that collects personal information about a consumer, the consumer shall have the right to request disclosure of, and a business that collects personal information about a consumer shall disclose to the consumer upon receipt of a verifiable consumer request, the following:</p> <ul style="list-style-type: none"> the categories of personal information the business has collected about the consumer; 		

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<ul style="list-style-type: none"> any legitimate interests pursued by the controller or third parties in collecting the personal data categories of personal data concerned recipients, or categories of recipients, of the personal data, if any, whether the controller intends to transfer personal data internationally and reference to suitable safeguards and the means to obtain copy of them. <p>A14.1.</p> <p>The controller shall provide the data subject the following information free of charge (unless the requests is unfounded or excessive and demonstrated by the controller), and in standard icons to give in an easily visible, intelligible and clearly legible manner, to ensure fair and transparent processing:</p> <ul style="list-style-type: none"> the period of storage or criteria to determine that period; existence of the right to request access to and rectification or erasure of personal data or restriction of processing or object to processing and the right to portability; the existence of right to withdraw consent at any time without affecting the lawfulness of the processing on the prior consent; the right to lodge a complaint with a supervisory authority; from which source the personal data originate and whether it came from publicly accessible sources; the existence of automated decision-making, including 	<ul style="list-style-type: none"> the categories of sources from which the personal information is collected; the business or commercial purpose for collecting or selling personal information; the categories of third parties with whom the business shares personal information; the specific pieces of personal information it has collected about that consumer. <p>Section 3, 1798.110(a)(b).</p> <p>A verifiable consumer request or verifiable request means a request made by a consumer, or on behalf of a consumer’s minor child, or by a natural person registered with the Secretary of State who is authorized to act on behalf of the consumer, and that the business can reasonably verify pursuant to regulations adopted by the Attorney General. Section 3, 1798.140(y).</p> <p>A business that collects personal information about consumers shall disclose the following:</p> <ul style="list-style-type: none"> the categories of personal information the business has collected about the consumer; the categories of sources from which the personal information is collected; the business or commercial purpose for collecting or selling personal information; the categories of third parties with whom the business shares personal information; the specific pieces of personal information it has collected about that consumer. <p>Section 3, 1798.110(c).</p>		

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<p>profiling, and meaningful information related to it. Where requests are manifestly unfounded or excessive, the controller may charge a reasonable fee taking into account administrative costs or refuse to act on the request. A14.2; A12.5.</p>			
<p>The controller shall provide this information within a reasonable period after obtaining the personal data but at least within one month; and if the personal data are being used for communication with the data subject, the information shall be provided concurrent with the first communication; and for disclosures to other recipients, when the personal data are first disclosed. A14.3.</p>			
<p>Where the controller intends to further process personal data for another purpose, the controller shall provide the data subject prior to the further processing with information on that other purpose and other relevant information. A14.4.</p>			
<p>The rights above do not apply where:</p> <ul style="list-style-type: none"> • the data subject already has the information; • provision of the information proves impossible or would involve a disproportionate effort, subject to conditions and safeguards for ensuring technical and organizational measures are in place, including data minimization and pseudonymization; 			

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<ul style="list-style-type: none"> obtaining or disclosure is expressly laid out by the EU or member state law; where personal data must remain confidential subject to an obligation of professional secrecy regulated by the EU or a member state. A14.5. 			
<p>Rights: access by data subject</p> <p>Data subject has the right to obtain confirmation from controller as to whether his/her personal data is being processed and access to that data and the following:</p> <ul style="list-style-type: none"> purposes of the processing; categories of personal data concerned; recipients, or categories of recipients, of the personal data, if any, the envisaged period for which the personal data will be stored or the criteria for determining that period existence of the right to request from the controller rectification or erasure of personal data or restriction of processing of the personal data; the right to lodge a third-party complaint with a supervising authority; where personal data are not collected from the data subject, any available information on the source; the existence of automated decision-making, including profiling, and meaningful information related to it. A15.1. 	<p>A consumer shall have the right to request that a business that collects a consumer's personal information disclose the categories and specific pieces of personal information collected. The business shall provide the information to a consumer upon receipt of a verifiable consumer request. A business need not retain information collected for a single, one-time transaction, if such information is not sold or retained by the business or to re-identify or otherwise link information that is not maintained in a manner that would be considered personal information. Section 3, 1798.100(a)(b)(c)(e).</p>	<p>The registered owner or lessee of a subject vehicle has the right to inquire about the nature, accuracy, status and use of and the right to examine the personally identifiable information or a reasonable facsimile thereof. OAR 731-090-0010(5)(a)(b).</p> <p>The DOT or certified service provider shall respond to requests for inquiry or examination within five business days of receipt of the request. OAR 731-090-0010(5)(e).</p>	<p>A distance charge payer has the right inquire about the nature, accuracy, status and use of personal information and the right to examine the personally identifiable information, or a reasonable facsimile thereof, and the right to request from the service provider rectification or erasure of personal information, if held beyond the 30-day holding period, and the right to lodge a third-party complaint with the DOT.</p> <p>The service provider shall respond to requests for inquiry or examination within five business days of receipt of the request.</p>
<p>Whether the personal data are transferred internationally, the data subject shall have the right to be</p>			

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informed of appropriate safeguards. A15.2.			
Controller shall provide a copy of personal data undergoing processing but may only charge a reasonable fee for additional copies. Requests made by electronic means may be responded to in kind. The right to obtain a copy shall not adversely affect the rights and freedoms of other. A15.3.	The business shall disclose and deliver the requested personal information free of charge. The information may be provided by mail or electronically and if so portably and in a readily useable format that allows the consumer to transmit this information to another entity without hindrance. A business shall not be required to provide personal information to a consumer more than twice in a 12-month period. Section 3, 1798.100(d).		
Rights: rectification	The data subject has the right to rectification of inaccurate personal data without undue delay or to have incomplete personal data completed. A16.	The registered owner or lessee of a subject vehicle has the right to request corrections of personally identifiable information upon provision of reasonable evidence that the information has errors or has changed. OAR 731-090-0010(5)(c). The DOT or certified service provider shall respond to requests for corrections within five business days of receipt of the request. OAR 731-090-0010(5)(e).	The distance charge payer has the right to request rectification of personal information upon provision of reasonable evidence that the information has errors or has changed. The service provider shall respond to requests rectification within five business days of receipt of the request.
Right to erasure (right to be forgotten)	The data subject has the right to erasure of personal data without undue delay and the controller has the obligation to erase personal data without undue delay where one of the following grounds applies: <ul style="list-style-type: none"> the personal data are no longer necessary for the purpose of the collection; the data subject withdraws consent on which processing is based; the personal data have been unlawfully processed; 	A consumer shall have the right to request that a business delete any personal information about the consumer which the business has collected from the consumer. A business that collects personal information about consumers shall disclose, including the designated methods for submitting requests, the consumer's rights to request deletion of the consumer's personal information. A business that receives a verifiable request from a consumer to delete the consumer's personal information shall delete the information from its records and direct any service providers to	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 DOT and certified service provider shall destroy records of the location and daily metered use of subject vehicles. ORS 319.915(4). 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 service provider shall erase records of the location and daily metered use of subject vehicles. The data subject has the right to erasure of personal data without undue delay and the controller has the obligation to erase personal data without undue delay.

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<ul style="list-style-type: none"> compliance with a legal obligation is necessary; personal data were collected for information society services. <p>A17.1.</p>	<p>delete the consumer's personal information from their records.</p> <p>Section 3, 1798.105(a)(b)(c).</p> <p>Designated methods for submitting requests means a mailing address, email address, Internet Web page, Internet Web portal, toll-free telephone number, or other applicable contact information, whereby consumers may submit a request or direction under the California Consumer Privacy Law, and any new, consumer-friendly means of contacting a business, as approved regulations or otherwise by the Attorney General. Section 3, 1798.140(i).</p>		
	<p>A business or service provider shall not be required to comply with a deletion request if the information is necessary for the business or service provider to maintain the information in order to:</p> <ul style="list-style-type: none"> Complete the transaction for which the personal information was collected, provide a good or service requested by the consumer, or reasonably anticipated within the context of as business's ongoing business relationship with the consumer, or otherwise perform a contract between the business and the consumer; Detect security incidents, protect against malicious, deceptive, fraudulent, or illegal activity; or prosecute those responsible for that activity; Debug to identify and repair errors that impair existing intended functionality; Exercise free speech, ensure the right of another consumer to exercise his/her right to free speech, or exercise another right provided by law; Comply with the California Electronic Privacy Act; Engage in public or peer-reviewed scientific, historical, or statistical research in the public interest that adheres to all 	<p>Non-compliance investigation means an investigation by DOT to determine if, and to what extent, any person, including but not limited to a payer of road usage charges, is in compliance with the statutory provisions of the Road Usage Charge Program and associated administrative rules. Such investigations may include informal inquiries or a formal review of the relevant records and the mileage reporting method of the payer or manager of accounts to ascertain the extent of non-compliance, if any. OAR 731-090-0010(17).</p> <p>The registered owner or lessee of a subject vehicle has the right to erasure of the location and daily metered use data that has not been destroyed within the required period of time. OAR 731-090-0010(5)(d).</p> <p>The DOT or certified service provider shall respond to requests for erasure within five business days</p>	<p>Non-compliance investigation means an investigation by the authorized agency to determine if, and to what extent, any person, including but not limited to a distance charge payer, is in compliance with the statutory provisions of the Road Usage Charge Program and associated administrative rules. Such investigations may include informal inquiries or a formal review of the relevant records and the mileage reporting method of the payer or manager of accounts to ascertain the extent of non-compliance, if any.</p> <p>The registered owner or lessee of a subject vehicle has the right to erasure of the location and daily metered use data that has not been destroyed within the required period of time. The service provider shall respond to requests for erasure within five business days of receipt of the request.</p>

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	<p>other applicable ethics and privacy laws, when the businesses' deletion of the information is likely to render impossible or seriously impair the achievement of such research, if the consumer has provided informed consent;</p> <ul style="list-style-type: none"> • To enable solely internal uses that are reasonably aligned with the expectations of the consumer based on the consumer's relationship with the business; • Comply with a legal obligation; • Otherwise use the consumer's personal information, internally, in a lawful manner that is compatible with the context in which the consumer provided the information. Section 3, 1798.105(d). 	<p>of receipt of the request. OAR 731-090-0010(5)(e).</p>	
		<p>Exceptions:</p> <ul style="list-style-type: none"> • Information retained in records may be retained, aggregated and used for purposes of traffic management and research after personally identifiable information has been removed. ORS 319.915(4)(b)(A). • Monthly summaries of metered use by subject vehicles may be retained in VIN Summary Reports. VIN summary report means a monthly report by DOT or certified service provider that includes a summary of all vehicle identification numbers of subject vehicles and associated total metered use during the month but not include location information. ORS 319.915 (1)(c) and (4)(b)(C). • A certified service provider may retain and use records of location and daily metered use 	<p>Exceptions:</p> <ul style="list-style-type: none"> • Records accumulated as anonymized aggregated information may be retained and used for purposes of traffic management and research. • Monthly summaries of metered use by subject vehicles may be retained in VIN Summary Reports. VIN summary report means a monthly report by • service provider that includes a summary of all vehicle identification numbers of subject vehicles and associated total metered use during the month but not include location information. • A service provider may retain and use records of location and daily metered use of subject vehicles if the registered owner or lessee of the subject vehicle consents to the retention. Consent does not entitle the authorized agency to obtain or use the records or the information in

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		<p>of subject vehicles if the registered owner or lessee of the subject vehicle consents to the retention. Consent does not entitle the DOT to obtain or use the records or the information in the records. ORS 319.915(4)(b)(B); OAR 731-090-0010(3).</p> <p>Consent means voluntary agreement given to retain location and daily metered use beyond the period required by law. OAR 731-090-0010(6).</p>	<p>the records. Any records retained by authority of consent of the road usage charge payer shall be anonymized.</p> <p>Consent means voluntary agreement given to retain location and daily metered use beyond the period required by law.</p>
<p>Where controller is obligated to erase personal data, controller shall take reasonable steps to inform controllers of the request for erasure. A17.2.</p>			
<p>The right of erasure shall not apply to the extent processing is necessary:</p> <ul style="list-style-type: none"> • for exercising right of freedom of expression and information; • compliance with a legal obligation; • reasons of public interest in public health; • archiving purposes in the public interest, scientific, historical or statistical purposes; • establishment, exercise or defense of legal claims. A17.3. 			<p>The right of erasure shall not apply to the extent processing is necessary for compliance with a legal obligation or establishment, exercise or defense of legal claims.</p>
<p>Right to restriction of processing</p>	<p>The data subject shall have the right to obtain restriction of processing where one of the following applies:</p> <ul style="list-style-type: none"> • Accuracy of personal data is contested for the period enabling controller to verify accuracy; • Processing is unlawful and data subject opposes erasure; 		

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<ul style="list-style-type: none"> • Controller no longer needs personal data for purposes of processing but required by data subject for reasons related to legal claims; • Data subject objects to processing pending verification whether controller has legitimate grounds. A18.1. 			
	<p>Where processing is restricted, personal data shall only be restricted, other than for storage, with data subject's consent related to legal claims or for protection of rights of another natural or legal person or for reasons of public interest. A18.2.</p>		
	<p>Controller shall inform data subject before restriction of processing is lifted. A18.3.</p>		
<p>Notification obligation regarding rectification or erasure or restriction of processing</p>	<p>Controller shall communicate any rectification or erasure of personal data or restriction of processing to each recipient to which personal data were disclosed and inform data subject about recipients, if requested. A19.</p>		<p>The service provider shall communicate any rectification or erasure of personal information to each recipient to which personal information were disclosed and inform distance charge payers about recipients, if requested.</p>
<p>Right to data portability</p>	<p>Data subject has right to receive personal data provided to a controller in a structured, commonly used and machine-readable format and has the right to transmit those data to another controller without hindrance where:</p> <ul style="list-style-type: none"> • Processing is based on consent; • Processing is carried out by automated means. A20.1. 		<p>A road usage charge payer has right to receive personal information provided to a service provider in a secure, structured, commonly used and machine-readable format and has the right to transmit that personal information to another service provider without hindrance.</p> <p>A road usage charge payer has the right to have personal information securely transmitted directly from one service provider to another where technically feasible.</p>

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<p>Data subject has right to have personal data transmitted directly from one controller to another where technically feasible but this right shall not apply to processing necessary for carrying out public interest or exercise of official authority vested in controller nor adversely affect the rights of others. A20.2.3.4.</p>			
<p>Right to object</p> <p>Data subject shall have right to object at any time to processing of personal data which is based on carrying out a task in the public interest or exercise of controller's official authority or pursuits of legitimate interests. Controller shall no longer process the personal data unless controller demonstrates compelling legitimate grounds for processing sufficient to override interests, rights and freedoms of data subject or for establishment, exercise or defense of legal claims. A21.1.</p>			
<p>Data subject shall have the right at any time to object to use of personal data for direct marketing purposes, including profiling, and those data will no longer be used for those purposes. A21.2.3.</p>	<p>A consumer shall have the right to request that a business that sells the consumer's personal information, or that discloses it for a business purpose, shall disclose to the consumer:</p> <ul style="list-style-type: none"> • the categories of personal information that the business collected about the consumer; • the categories of personal information that the business sold about the consumer and the categories of third parties to whom the personal information was sold, by category or categories of personal information for each third party to whom the personal information was sold; • the categories of personal information that the business disclosed about the consumer for a business purpose. <p>Section 3, 1798.115(a).</p>		

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	<p>A business that sells personal information about a consumer or that discloses a consumer's personal information shall disclose to that consumer:</p> <ul style="list-style-type: none"> the categories of personal information that the business collected about the consumer; the categories of personal information that the business sold about the consumer and the categories of third parties to whom the personal information was sold, by category or categories of personal information for each third party to whom the personal information was sold; the categories of personal information that the business disclosed about the consumer for a business purpose. <p>Section 3, 1798.115(b).</p> <ul style="list-style-type: none"> A business that sells consumers' personal information, or that discloses consumers' personal information for a business purpose, shall disclose: <ul style="list-style-type: none"> the category or categories of consumers' personal information it has sold, or if the business has not sold consumers' personal information, it shall disclose that fact; the category or categories of consumers' personal information it has disclosed for a business purpose, or if the business has not disclosed the consumers' personal information for a business purpose, it shall disclose that fact. Section 3, 1798.115(c). <p>A third party shall not sell personal information about a consumer that has been sold to the third party by a business unless the consumer has received explicit notice and is provided an opportunity to exercise the right to opt out. Section 3, 1798.115(d).</p>		

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<p>Right to Opt Out and Right to Opt In</p>	<p>Right to Opt Out. A consumer shall have the right, at any time, to direct a business that sells personal information about the consumer to third parties <u>not</u> to sell the consumer’s personal information. Section 3, 1798.120(a).</p> <p>A business that sells consumers’ personal information to third parties shall provide notice to consumers that this information may be sold and that consumers have the right to opt out of the sale of their personal information. Section 3, 1798.120(b).</p> <p>A business that has received direction from a consumer not to sell the consumer’s personal information or, in the case of a minor consumer’s personal information has not received consent to sell the minor consumer’s personal information shall be prohibited from selling the consumer’s personal information after its receipt of the consumer’s direction, unless the consumer subsequently provides express authorization for the sale of the consumer’s personal information. Section 3, 1798.120(c).</p> <p>(1) Provide a clear and conspicuous link on the business’ Internet homepage, titled “Do Not Sell My Personal Information,” to an Internet Web page that enables a consumer, or a person authorized by the consumer, to opt out of the sale of the consumer’s personal information. A business shall not require a consumer to create an account in order to direct the business not to sell the consumer’s personal information.</p> <p>(2) Include a description of a consumer’s rights along with a separate link to the “Do Not Sell My Personal Information” Internet Web page in:</p> <p>(A) Its online privacy policy or policies if the business has an online privacy policy or policies.</p>		

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	<p>(B) Any California-specific description of consumers' privacy rights.</p> <p>(3) Ensure that all individuals responsible for handling consumer inquiries about the business's privacy practices or the business's compliance with this title are informed of all requirements related to the rights of disclosure, opt in, opt out and notice and how to direct consumers to exercise these rights.</p> <p>(4) For consumers who exercise their right to opt out of the sale of their personal information, refrain from selling personal information collected by the business about the consumer.</p> <p>(5) For a consumer who has opted out of the sale of the consumer's personal information, respect the consumer's decision to opt out for at least 12 months before requesting that the consumer authorize the sale of the consumer's personal information.</p> <p>(6) Use any personal information collected from the consumer in connection with the submission of the consumer's opt-out request solely for the purposes of complying with the opt-out request. Section 3, 1798.135(a).</p> <p>Nothing in this law shall be construed to require a business to comply by including the required links and text on the homepage that the business makes available to the public generally, if the business maintains a separate and additional homepage that is dedicated to California consumers and that includes the required links and text, and the business takes reasonable steps to ensure that California consumers are directed to the homepage for California consumers and not the homepage made available to the public generally. Section 3, 1798.135(b).</p> <p>A consumer may authorize another person solely to opt out of the sale of the consumer's personal information on the consumer's behalf, and a business shall comply with an opt out request received from a person authorized by</p>		

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	<p>the consumer to act on the consumer’s behalf, pursuant to regulations adopted by the Attorney General. Section 3, 1798.135(c).</p> <p>Right to Opt In. A business shall not sell the personal information of consumers if the business has actual knowledge that the consumer is less than 16 years of age, unless the consumer, in the case of consumers between 13 and 16 years of age, or the consumer’s parent or guardian, in the case of consumers who are less than 13 years of age, has affirmatively authorized the sale of the consumer’s personal information. A business that willfully disregards the consumer’s age shall be deemed to have had actual knowledge of the consumer’s age. Section 3, 1798.120(c).</p>		
<p>No discrimination for Exercise of Rights</p>	<p>A business shall not discriminate against a consumer because the consumer exercised any of the consumer’s rights under this title, including, but not limited to, by:</p> <ul style="list-style-type: none"> (A) Denying goods or services to the consumer. (B) Charging different prices or rates for goods or services, including through the use of discounts or other benefits or imposing penalties. (C) Providing a different level or quality of goods or services to the consumer, if the consumer exercises the consumer’s rights under this title. (D) Suggesting that the consumer will receive a different price or rate for goods or services or a different level or quality of goods or services. <p>Nothing in this subdivision prohibits a business from charging a consumer a different price or rate, or from providing a different level or quality of goods or services to the consumer, if that difference is reasonably related to the value provided to the consumer by the consumer’s data. Section 3, 1798.125(a).</p>		<p>A service <i>provider</i> shall not discriminate against a road usage charge payer because the road usage charge payer did not give express approval to the service provider to enable sharing of personal information.</p> <p>A service provider may offer a different price, rate, level, or quality of goods or services to the road usage charge payer if that price or difference is directly related to the value provided to the road usage charge payer by the road usage charge payer’s personal information.</p> <p>A service provider shall not use financial incentive practices that are unjust, unreasonable, coercive, or usurious in nature.</p>

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	<p>A business may offer financial incentives, including payments to consumers as compensation, for the collection of personal information, the sale of personal information, or the deletion of personal information. A business may also offer a different price, rate, level, or quality of goods or services to the consumer if that price or difference is directly related to the value provided to the consumer by the consumer's data.</p> <p>A business that offers any financial incentives shall notify consumers of the financial incentives in the same manner that notice is given that information may be sold.</p> <p>A business may enter a consumer into a financial incentive program only if the consumer gives the business prior opt-in consent which clearly describes the material terms of the financial incentive program, and which may be revoked by the consumer at any time.</p> <p>A business shall not use financial incentive practices that are unjust, unreasonable, coercive, or usurious in nature. Section 3, 1798.125(b).</p>		
<p>The right to object shall be explicitly brought to the attention of data subject at the first communication. A21.4.</p>			
<p>For information society services, data subject may exercise right to object by automated means using technical specifications. A21.5.</p>			
<p>Where personal data are processed for scientific or historical research or statistical purposes, the data subject shall have right to object to processing unless the task is carried out for reasons of the public interest. A21.6.</p>			

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	<p>In order to comply with the rights to disclose, delete, and not discriminate, a business shall, in a form reasonably accessible,</p> <p>(1) Make available to consumers two or more designated methods for submitting requests for information required to be disclosed, including, at a minimum, a toll-free telephone number, and if the business maintains an Internet Web site, a Web site address.</p> <p>(2) Disclose and deliver the required information to a consumer free of charge within 45 days of receiving a verifiable request from the consumer. The business shall promptly take steps to determine whether the request is a verifiable request, but this shall not extend the business's duty to disclose and deliver the information within 45 days of receipt of the consumer's request. The time period to provide the required information may be extended once by an additional 45 days when reasonably necessary, provided the consumer is provided notice of the extension within the first 45-day period. The disclosure shall cover the 12-month period preceding the business's receipt of the verifiable request and shall be made in writing and delivered through the consumer's account with the business, if the consumer maintains an account with the business, or by mail or electronically at the consumer's option if the consumer does not maintain an account with the business, in a readily useable format that allows the consumer to transmit this information from one entity to another entity without hindrance. The business shall not require the consumer to create an account with the business in order to make a verifiable request.</p> <p>(3) For purposes of complying with a verifiable request from the consumer seeking disclosure of information collected:</p> <p>(A) To identify the consumer, associate the information provided by the consumer in the verifiable request to any personal information</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	<p>previously collected by the business about the consumer.</p> <p>(B) Identify by category or categories the personal information collected about the consumer in the preceding 12 months by reference to the enumerated category or categories in the definition of "personal information" that most closely describes the personal information collected.</p> <p>(4) For purposes of a request for disclosure of personal information that the business may sell:</p> <p>(A) Identify the consumer and associate the information provided by the consumer in the verifiable request to any personal information previously collected by the business about the consumer.</p> <p>(B) Identify by category or categories the personal information of the consumer that the business sold in the preceding 12 months by reference to the enumerated category in the definition of "personal information" that most closely describes the personal information, and provide the categories of third parties to whom the consumer's personal information was sold in the preceding 12 months by reference to the enumerated category or categories in the definition of "personal information" that most closely describes the personal information sold. The business shall disclose the information in a list that is separate from a list generated for the purposes of subparagraph (C).</p> <p>(C) Identify by category or categories the personal information of the consumer that the business disclosed for a business purpose in the preceding 12 months by reference to the enumerated category or categories in the definition of "personal information" that most closely describes the personal information, and provide the categories of third parties to whom the consumer's personal information was disclosed for a business purpose in the preceding 12 months by reference to the</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	<p>enumerated category or categories in the definition of “personal information” that most closely describes the personal information disclosed. The business shall disclose the information in a list that is separate from a list generated for the purposes of subparagraph (B).</p> <p>(5) Disclose the following information in its online privacy policy or policies if the business has an online privacy policy or policies and in any California-specific description of consumers’ privacy rights, or if the business does not maintain those policies, on its Internet Web site, and update that information at least once every 12 months:</p> <p>(A) A description of a consumer’s rights to disclose and not to sell and one or more designated methods for submitting requests.</p> <p>(B) For purposes of disclosure of personal information collected, a list of the categories of personal information it has collected about consumers in the preceding 12 months by reference to the enumerated category or categories that most closely describe the personal information collected.</p> <p>(C) For purposes of disclosure of personal information that a business may sell, two separate lists:</p> <p>(i) A list of the categories of personal information it has sold about consumers in the preceding 12 months by reference to the enumerated category or categories that most closely describe the personal information sold, or if the business has not sold consumers’ personal information in the preceding 12 months, the business shall disclose that fact.</p> <p>(ii) A list of the categories of personal information it has disclosed about consumers for a business purpose in the preceding 12 months by reference to the enumerated category that most closely describe the personal information disclosed, or if the business has not disclosed consumers’ personal information for a business purpose in</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	<p>the preceding 12 months, the business shall disclose that fact.</p> <p>(6) Ensure that all individuals responsible for handling consumer inquiries about the business's privacy practices or the business's compliance with this title are informed of all requirements for disclosure and nondiscrimination, and how to direct consumers to exercise their rights under those sections.</p> <p>(7) Use any personal information collected from the consumer in connection with the business's verification of the consumer's request solely for the purposes of verification.</p> <p>Section 3, 1798.130(a).</p> <p>A business is not obligated to provide the information required for disclosure to the same consumer more than twice in a 12-month period. Section 3, 1798.130(b).</p> <p>The categories of personal information required to be disclosed shall follow the definition of personal information. Section 3, 1798.130(c).</p>		
<p><i>Right to decision-making not based solely on automated processing</i></p>	<p>Data subject has right to not be subject to decisions based solely on automated processing, including profiling, which produces legal affects but this right shall not apply if the decisions is necessary for entering into or performing a contract between data subject and a data controller or based on the data subject's explicit consent, in which cases controller shall implement suitable safeguards of data subject's rights, freedoms and legitimate interests, at least the right to human intervention to express a point of view or to contest the decision; or is authorized by law. These decisions shall not be based on special categories of personal</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	interest unless consent is given or the public interest is pursued and safeguards are in place to protect the data subject's rights, freedoms and legitimate interests. A22.1.2.3.4.		
Restrictions	Member state have the right to enact law restricting the scope of the rights and obligations regarding personal data for certain national interests. A23.		
IV. CONTROLLER AND PROCESSOR			
GENERAL OBLIGATIONS			
Responsibility of controller	In context, the controller shall implement appropriate technical and organizational measures to enable and demonstrate that processing is performed in accordance with GDPR, including implementation of data protection policies. Adherence to codes of conduct (A40) or approved certification mechanisms (A42) may demonstrate compliance. A24.1.2.3.		
Data protection by design and default	In context, the controller shall implement appropriate technical and organizational measure, including pseudonymization, designed to implement data-protection principles, such as data minimization, and to implement safeguards into processing. A25.1.		
	The controller shall implement appropriate technical and organizational measures for ensuring that, by default, only personal data necessary for each specific purpose for processing are processed. A25.2.		

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	Approved certification mechanisms (A42) may be used as an element to demonstrate compliance. A25.3.			
Joint controllers	Joint controller shall enter into an arrangement for determining their respective responsibilities and duties which duly reflects their roles. Irrespective of an arrangement, the data subject may exercise rights against each of the controllers. A26.1.2.3.			
Representatives of controllers or processors not established in EU	Controllers or processors not established in the EU shall designate a representative in writing but shall not apply to pressing that is occasional or by a public authority or body. A27.			
Processor	Controllers shall only use processors providing sufficient guarantees to implement appropriate technical and organizational measures that will meet the UE GDPR. A28.1.			
	Processor has no authority to engage another processor without authorization by controller. A28.2.			
	Processing by processor shall be governed by contract in writing and the contract shall have specific stipulations and can be based on standard contractual clauses. Any processor the processor engages shall be subject to the terms of that contract. A28.3.4&6.7.8.9.			
	Adherence to codes of conduct (A40) or approved certification mechanisms (A42) may demonstrate compliance. A28.5.			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	If a processor determines the purposes and means of processing, the processor shall be considered a controller. A28.10.		
Processing under authority of controller of processor	Processor or any person acting under authority of controller or processor, who has access to personal data, shall not process those data except on instructions from the controller. A29.		
Records of processing activities	Each controller shall maintain in writing a record of certain processing activities under its responsibility which record shall be made available to the supervisory authority upon its request. A30.1&3.4.		
	Each processor shall maintain in writing a record of categories of certain processing activities carried out on behalf of the controller which record shall be made available to the supervisory authority upon its request. A30.2.3.4.		
	The requirement to maintain a record shall not apply to an organization or enterprise with less than 250 employees unless the processing not occasional and is likely to result in risk of rights and freedoms of data subjects or the processing includes special categories of data relating to racial or ethnic origin, public opinions, religious or philosophical beliefs, trade union membership, and processing of genetic data or biometric data or uniquely identifying a person, data concerning health or data concerning a natural person's sex life or sexual orientation or personal data relating to criminal convictions or offenses. A30.5.		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Cooperation of supervisory authority	Controller or processor shall cooperate with supervisory authority in the performance of its tasks. A31.		
SECURITY OF PERSONAL DATA			
Security of processing	In context, the controller shall implement appropriate technical and organizational measures to ensure a level of security appropriate to the risk of destruction, loss, alteration, unauthorized disclosure of or access to personal data, including the following: <ul style="list-style-type: none"> • pseudonymization and encryption of personal data; • ability to ensure ongoing confidentiality, integrity, availability and resilience of processing systems and services; • ability to restore availability and access to personal data in a timely manner in event of an incident. A32.1.2. 		The service provider shall implement appropriate technical and organizational measures to ensure a level of security appropriate to the risk of destruction, loss, alteration, unauthorized disclosure of or access to personal information, including but not limited to the following: <ul style="list-style-type: none"> • pseudonymization and encryption of personal information; • ability to ensure ongoing confidentiality, integrity, availability and resilience of processing systems and services; • ability to restore availability and access to personal information in a timely manner in event of an incident. <p>Pseudonymization means the processing of personal information in a manner that renders the personal information no longer attributable to a specific road usage charge payer without the use of additional information.</p>
	Adherence to codes of conduct (A40) or approved certification mechanisms (A42) may demonstrate compliance. A32.3.		
	Controller or processor shall take steps to ensure any natural person acting under their authority does not process personal data except on instructions from the controller unless require by EU or member state law. A32.4.		

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Notification of personal data breach	For a personal data breach, the controller shall without undue delay and where feasible, not later than 72 hours after awareness of it, notify the breach to the supervisory authority unless it is unlikely there is risk to rights and freedoms of natural persons. Where notice is not made within 72 hours, it shall contain reasons for the delay. A33.1.			For a personal information breach, the service provider shall without undue delay and where feasible, not later than 72 hours after awareness of it, notify the breach to the authorized agency unless it is unlikely there is risk to rights and freedoms of natural persons. Where notice is not made within 72 hours, it shall contain reasons for the delay.
	<p>The notification shall:</p> <ul style="list-style-type: none"> describe the nature of the personal data breach, including the categories and approximate number of data subjects and personal data records involved; communicate the name and contact details of the data protection officer or other contact; describe the likely consequences; describe the measures taken to address the personal data breach, its effects and remedial action taken, including measure to mitigate. This information may be provided in phases where this information cannot be provided at the same time. <p>A33.3.4.</p>			<p>The notification shall:</p> <ul style="list-style-type: none"> describe the nature of the personal information breach, including the categories and approximate number of road usage charge payers and personal information records involved; communicate the name and contact details of the designated personal information officer of the service provider or other contact; describe the likely consequences; describe the measures taken to address the personal information breach, its effects and remedial action taken, including measures to mitigate. This information may be provided in phases where this information cannot be provided at the same time.
	Controller shall document any personal data breaches, including facts, its effects and remedial action taken. A33.5			
	Processor shall notify controller of data breach without undue delay after awareness of it. A33.2.			
Communication of personal data	Where a personal data breach is likely to result in high risk to rights and freedoms of natural persons, the			Where a personal information breach is likely to result in high risk to rights and freedoms of natural persons, the service

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
breach to data subject	<p>controller shall communicate the breach in clear and plain language to data subject without delay. A34.1.2.</p> <p>The communication shall not be required if:</p> <ul style="list-style-type: none"> • controller has implemented appropriate technical and organizational measures which were applied to the personal data affected by the breach; • controller has taken subsequent measures which ensure high risk to rights and freedoms of data subjects are unlikely to materialize; • it would involve a disproportionate effort and a public communication is made that is equally effective. A34.3. <p>If controller makes no communication about a personal data breach, the supervisory authority may require a controller to do so. A34.4.</p>			<p>provider shall communicate the breach in clear and plain language to the road usage charge payer without delay.</p> <p>The communication shall not be required if:</p> <ul style="list-style-type: none"> • service provider has implemented appropriate technical and organizational measures which were applied to the personal information affected by the breach; • service provider has taken subsequent measures which ensure high risk to rights and freedoms of road usage charge payers are unlikely to materialize; • it would involve a disproportionate effort and a public communication is made that is equally effective. <p>If the service provider makes no communication about a personal information breach, the authorized agency may require a service provider to do so.</p>
DATA PROTECTION AND IMPACT ASSESSMENT AND PRIOR CONSULTATION				
Data protection impact assessment	<p>Where a type of processing using new technologies, in context, is likely to result in high risk to rights and freedoms of natural persons, (or there is a change in risk for the processing), the controller shall, prior to processing and upon the advice of the data protection officer, carry out an assessment of impact of the envisaged processing operations on protection of personal data. A35.1.2&11.</p>			
	<p>A data protection assessment shall be required in particular cases:</p>			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<ul style="list-style-type: none"> • extensive and extensive evaluation of personal aspects of natural persons based on automated processing, including profiling, on which produce legal effects; • processing on a large scale of special categories of data relating to racial or ethnic origin, public opinions, religious or philosophical beliefs, trade union membership, and processing of genetic data or biometric data or uniquely identifying a person, data concerning health or data concerning a natural person's sex life or sexual orientation or personal data relating to criminal convictions or offenses; • systematic monitoring of a publicly accessible area on a large scale. A35.3. 			
	<p>Supervisory authority shall establish and make public a list of the kind of processing operation subject to requirement of a data protection assessment. A35.4.</p>		
	<p>Monitoring behavior of those on the list with the EU. A35.6.</p>		
<p>The assessment shall contain at least:</p> <ul style="list-style-type: none"> • a systematic description of the envisaged processing operations, the purposes for processing and the legitimate interest pursued by controller; • an assessment of necessity and proportionality of processing activity in relation to purposes; • an assessment of risks to rights and freedoms of data subjects; 			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<ul style="list-style-type: none"> measures to address risks, including safeguards, security measures and mechanisms to ensure protection of personal data and demonstrate compliance with EU GDPR. A35.7. 			
	<p>Compliance with approved codes of conduct (A40) shall be taken into due account in assessing impact of processing operations. A35.8.</p>		
	<p>Controller shall seek views of data subjects on the intended processing, where appropriate. A35.9.</p>		
	<p>Provision where member state law regulates data protection impact assessment. A35.10.</p>		
<p>Prior consultation</p> <p>Controller shall consult with supervisory authority prior to processing where data protection impact assessment (A35) indicates high risk in the absence of measure to mitigate. A36.1.</p> <p>When consulting with supervisory authority, controller shall provide:</p> <ul style="list-style-type: none"> respective responsibilities of controller, joint controllers and processors in processing, particularly with a group of undertakings; purposes and means of intended processing; measures and safeguards to protect rights and freedoms of data subjects; contract details of data protection officer; data protection impact assessment (A35); 			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
-other information requested by supervisory authority. A36.3.			
Where supervisory authority has the opinion that intended processing would infringe upon EU GDPR, the authority shall provide written advice to controller or processor and exercise its powers under (A58). A36.2.			
Member states legislative measures on processing. A36.4.			
Authority of member states to require consultation by controllers with supervisory authority. A36.5.			
DATA PROTECTION OFFICER			
Designation of data protection officer	Controller and processor shall designate data protection officer in any case where: <ul style="list-style-type: none"> • processing is carried out by public authority or body; • core activities of controller or processor consist of processing operations which, by their nature, require regular and systematic monitoring of data subjects; • core activities of control or processor consist of processing on a large scale of special categories of data relating to racial or ethnic origin, public opinions, religious or philosophical beliefs, trade union membership, and processing of genetic data or biometric data or uniquely identifying a person, data concerning health or data concerning a natural person's sex life or sexual orientation or personal data relating to criminal convictions or offenses. A37.1. 		A service provider shall designate a personal information officer to enable contact with road usage charge payers and the authorizing agency for purposes of assuring compliance with this policy. The designated personal information officer may be a staff member of the service provider (or fulfill the tasks on the basis of a service contract) but shall be designated on the basis of professional qualities and expert knowledge of personal information protection under this policy and practices and ability to fulfill tasks.

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Otherwise, controllers and processors or groups representing categories of them may designate a data protection officer. A37.4.			
A group of undertakings may appoint a single data protection officer provided the person is easily accessible from each establishment. A37.2.			
Where controller or processor is a public authority or body, a single data protection officer may be designated for several such authorities. A37.3.			
The data protection officer may be a staff member of the controller or processor (or fulfill the tasks on the basis of a service contract) but shall be designated on the basis of professional qualities and expert knowledge of data protection law and practices and ability to fulfill tasks (A39). A37.5.6.			
Controller or processor shall publish contact details of the data protection officer. A37.7.			
Position of the data protection officer	Controller and processor shall ensure the data protection officer is involved, properly and in a timely manner, in all issues related to protection of personal data and shall support the data protection officer in performing tasks by providing resources necessary to carry out tasks and access to personal data and processing operations and to maintain expert knowledge. A38.1.2.		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Controller and processor shall not instruct the data protection officer on performing tasks not shall data protection officer be dismissed or penalized for performing tasks. Data protection officer shall report to highest management level of controller or processor. A38.1.2.3.</p>			
<p>Data subjects may contact data processing officer regarding all issues related to processing of their personal data. A38.4.</p>			
<p>Data protection officer shall be bound by secrecy of confidentiality concerning performance of tasks. A38.5.</p>			
<p>Data protection officer may perform other tasks and duties that do not result in a conflict of interest. A38.6.</p>			
<p>Tasks of the data protection officer</p> <p>At minimum, the data protection office shall have the following tasks:</p> <ul style="list-style-type: none"> • inform and advise the controller or processor and their employees of their obligations under EU GDPR; • monitor compliance with EU GDPR, other UE or member state data protection provisions and policies of controller or processor related to protection of personal data, including assignment of responsibilities, aware-ness raising and training of staff of processing operations and related audits; • provide advice upon request regarding data protection impact assessment and monitor its performance; • cooperate with supervisory authority; 			

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<ul style="list-style-type: none"> act as contact point for the supervisory authority on issues related to processing and to consult on any other matter. A39.1. <p>In performing his tasks, the data protection office shall have due regard to risk associated with processing operations. A39.2.</p>			
CODES OF CONDUCT AND CERTIFICATION			
Codes of conduct	EU, member states and the supervisory authorities shall encourage drawing up codes of conduct for proper application of EU GDPR. A40.1.		The authorized agency and service providers shall establish, publish and adhere to an organizational usage and privacy policy. The organizational usage and privacy policy shall be available in writing to road usage charge payers, and shall be posted conspicuously on the authorized agency's website and each service provider's website.
	Authorizes associations and other bodies representing categories of controllers and processors to prepare codes of conduct related to application of the EU GDPR. A40.2.		The organizational usage and privacy policy shall include: <ul style="list-style-type: none"> The authorize purpose for collecting personal information; The identity and designated tasks for the personal information officer; Description of the employees and contractors authorized to access and collect personal information and identification of training requirements necessary for the employees and contractors; Description of how the personal information shall be monitored to ensure compliance with applicable privacy laws and a process for periodic system audits; Description of reasonable measures that will be used to ensure the accuracy of the personal information and correction of information errors;

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
			<ul style="list-style-type: none"> • Description of how compliance with security procedures and practices will be implemented and maintained; • Description of how compliance with the rights of road usage charge payers designated by this policy will be maintained; • The period for which the personal information will be stored or retained, by category; • The purpose of, and process for, sharing or disseminating personal information with other persons, whether by those authorized under this policy or by consent of motorists under this policy.
<p>Codes of conduct may be used by controllers and processors not subject to EU GDPR to provide safeguards for international transfers of personal data. A40.3.</p>			
<p>A code of conduct shall contain mechanisms for carrying out mandatory monitoring of compliance by controllers and processors which undertake to apply it. A40.4.</p>			
<p>Associations and other bodies preparing a code of conduct shall submit a draft code to the supervisory authority which will provide an opinion on compliance with EU GDPR and shall approve the draft code if it finds safeguards prove sufficient. A40.5.</p>			
<p>Supervisory authorities shall register and publish approved draft codes of conduct. A40.6.</p>			
<p>Provisions related to draft codes of conduct for multiple member states</p>			

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	and involvement of the EU Commission and Board. A40.7.8.		
	EU Commission may decide that approved codes of conduct have general validity within EU and receive appropriate publicity. A40.9.10.		
Monitoring of approved codes of conduct	A body monitoring compliance with a code of conduct requires accreditation by a supervisory authority to ensure an appropriate level of expertise relating to the subject matter. A41. 1.		
	<p>Accreditation to monitor compliance with a code of conduct requires the following:</p> <ul style="list-style-type: none"> • demonstrated independence and expertise on the subject-matter; • established procedures to assess eligibility of controller and processors to apply the code, monitor their own compliance and review its operation; • established procedures and structures to handle complaints about infringements of the code of conduct and making those procedures transparent to data subjects and the public; • demonstration to supervisory authority no conflict of interest. A41.2.		
	Administration provision related to accreditation. A41.3.		
	Accredited body shall take appropriate action in cases of infringement of a code of conduct, including suspension or exclusion. A41.4.		

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Administration provision related to revocation of suspension of accreditation. A41.5.			
This section shall not apply to public authorities and bodies. A41.5.			
Certification	Authorized member states to establish data protection certification mechanisms to demonstrate compliance of processing operations with the EU GDPR. A42.1.	The authorized agency shall establish certification mechanisms for service providers to demonstrate compliance with the requirements of this policy. Certification bodies shall issue and renew certification on the basis of criteria approved by the authorizing agency. Certification may be withdrawn where requirements for certification are no longer met.	
Accreditation shall be voluntary, last for a maximum of three years, and available via a process that is transparent and provide all information and access to its processing activities which are necessary to conduct certification. Certification may be withdrawn where requirements for certification are no longer met. A42.3&6.7.			
Related to accreditation for processing intended for international purposes. A42.2.			
Certification shall not reduce responsibilities of controller and processor for compliance with EU GDPR. A42.4.			
Certification shall be issued by certification bodies or a competent supervisory authority on basis of			

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criteria approved according to EU GDPR procedures. A42.5.			
EU specific administration procedures related to accreditation. A42.8.			
Certification bodies Certification bodies shall issue and renew certification. Certification bodies shall be accredited by: <ul style="list-style-type: none"> • the competent supervisory authority; • the national accreditation body under EU regulation. Certification bodies shall be accredited for a maximum of five years according to certain criteria set forth in the EU GDPR. A43.1.2.3.4. 			Independent certification bodies shall be accredited by a competent supervisory authority or a national accreditation body. Certification bodies shall be accredited for a maximum of five years according to certain criteria established by a competent supervisory authority or a national accreditation body.
EU procedures for accreditation and revocation of accreditation and adoption of technical standards for certification mechanisms. A43.5.6.7.8.9.			
V. TRANSFERS OF PERSONAL DATA TO THIRD COUNTRIES OR INTERNATIONAL ORGANIZATIONS			
General principles for transfers	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A44.		
Transfers on the basis of an adequacy decision	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A45.		
Transfers subject to appropriate safeguards	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A46.		

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Binding corporate rules	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A47.			
Transfers or disclosures not authorized by Union law	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A48.			
Derogations of specific situations	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A49.			
International cooperation for the protection of personal data	Personal data undergoing processing and intended for international purposes may be transferred only under certain conditions. A50.			
VI. INDEPENDENT SUPERVISORY AUTHORITIES				
Independent status				
Supervisory authority	Requires each member state to establish at least one supervisory authority to monitor application of the EU GDPR. A51.			
Independence	Requires independence for each supervisory authority. A52.			
General conditions for members of supervisory authority	Establishes conditions for members of a supervisory authority. A53.			
Rules on establishment of supervisory authority	Creates rules for establishment of supervisory authorities. A54.			

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COMPENTANCE, TASKS AND POWERS			
Competence	Requirements for competence for the supervisory authorities. A55.		
Competence of lead supervisory authority	Requirements for competence for the lead supervisory authority. A56.		
Tasks	Requirements for tasks of the supervisory authorities. A57.		
Powers	Requirements for powers for the supervisory authorities. A58.		
Activity reports	Each supervisory authority shall draw up an annual report. A59.		
VII. COOPERATION AND CONSISTENCY COOPERATION			
COOPERATION			
Cooperation between lead supervisory authority	Specific authorities and responsibilities for UE GDPR administration. A60.		
Mutual assistance	Specific authorities and responsibilities for UE GDPR administration. A61.		
Joint operations of supervisory authorities	Specific authorities and responsibilities for UE GDPR administration. A62.		
CONSISTENCY			
Consistency mechanism	Specific authorities and responsibilities for UE GDPR administration. A63.		
Opinions of Board	Specific authorities and responsibilities for UE GDPR administration. A64.		

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Dispute resolution by Board	Specific authorities and responsibilities for UE GDPR administration. A65.			
Urgency procedure	Specific authorities and responsibilities for UE GDPR administration. A66.			
Exchange of information	Specific authorities and responsibilities for UE GDPR administration. A67.			
EUROPEAN DATA PROTECTION BOARD				
European data protection board	Specific authorities and responsibilities for UE GDPR administration. A68.			
Independence	Specific authorities and responsibilities for UE GDPR administration. A69.			
Tasks of Board	Specific authorities and responsibilities for UE GDPR administration. A70.			
Reports	Specific authorities and responsibilities for UE GDPR administration. A71.			
Procedure	Specific authorities and responsibilities for UE GDPR administration. A72.			
Chair	Specific authorities and responsibilities for UE GDPR administration. A73.			
Tasks of Chair	Specific authorities and responsibilities for UE GDPR administration. A74.			

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Secretariat	Specific authorities and responsibilities for UE GDPR administration. A75.			
Confidentiality	Specific authorities and responsibilities for UE GDPR administration. A76.			
VIII. REMEDIES, LIABILITY AND PENALTIES				
Right to lodge complaint with supervisory authority	Every data subject has the right to lodge a complaint with a supervisory authority and the supervisory authority shall inform the complainant on the progress and outcome of the complaint and the possibility of judicial remedy. A77.1.2.			Every road usage charge payer has the right to lodge a complaint with an authorized agency which shall inform the complainant on the progress and outcome of the complaint and the possibility of judicial remedy.
Right to effective judicial remedy against supervisory authority	Each natural person or legal person has rights to an effective judicial remedy against a legally binding decision of a supervisory authority concerning them. A78.1.			Each road usage charge payer has rights to an effective judicial remedy against a legally binding decision of an authorized agency concerning them. Each road usage charge payer has a right to an effective judicial remedy where the authorized agency does not handle a complaint or does not inform the road usage charge payer within 3 months on the progress or outcome of complaint lodged.
	Each data subject has a right to an effective judicial remedy where supervisory authority does not handle a complaint or does not inform the data subject within 3 months or progress or outcome of complaint lodged. A78.2.			
	Jurisdiction for judicial remedy against supervisory authority. A78.3.			
Right to effective judicial remedy	Without prejudiced against any other available administrative or non-			Without prejudice against any other available administrative or non-judicial

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
against controller of processor	judicial remedy, each data subject has the right to an effective judicial remedy where rights are considered to have been infringed from processing personal data in non-compliance. A79.1.			remedy, each road usage charge payer has the right to an effective judicial remedy where rights are considered to have been infringed by a service provider in non-compliance with this policy.
	Jurisdiction for judicial remedy against controller or processor. A79.2.			
Representation of data subjects	The data subject has the right to mandate that a properly constituted public interest organization present a claim or rights on his/her behalf or a properly constituted public interest may pursue a claim with a mandate if it considers rights have been infringed. A80.1.2.			A road usage charge payer has the right to mandate that a properly constituted public interest organization present a claim or rights on his/her behalf.
Suspension of proceedings	A competent court may suspend proceedings it considers duplicative with other proceedings. A81.			
Rights to compensation and liability	Imposes rights to compensation for damages suffered and establishes liability for controllers which infringe upon the EU GDPR. Also, establishes sharing of liability among controllers. A82.1.2.3.4.5.6.			Road usage charge payers shall have the right to compensation for damages suffered by the actions of service providers which infringe upon rights and responsibilities contained in this policy.
General conditions for imposing administrative fines	Imposes administrative fines for violations of the EU GDPR that are effective, proportionate and dissuasive. When deciding whether to impose fines, due regard should be given to the following: <ul style="list-style-type: none"> nature, gravity and duration of the infringement, taking into account the scope or purpose of the processing and the level of damage suffered; intentional and negligent character of the infringement; 		The DOT, in any agreement with a certified service provider, shall provide for penalties if the certified service provider violated these privacy provisions. ORS 319.915(5).	Any service provider shall be in violation of this policy for failing to cure any alleged violation within 30 days after notification of alleged noncompliance and therefore liable for civil penalty. Any service provider that intentionally violates this policy shall be liable for a civil penalty of up to \$XXXXX for each violation but may be adjusted as necessary to ensure the costs incurred by the state are covered.

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<ul style="list-style-type: none"> • mitigation that occurred; • degree of controller responsibility; • relevant previous infringements; • degree of cooperation with supervisory authority; • categories of personal data affected; • manner in which the infringement became known to supervisory authority; • measures that have been previously issued against the controller or processor; • adherence to approved codes of conduct or approved certification mechanisms; • any other aggravating or mitigating factor. A83.1.2. 			
	<p>The administrative fine for a controller infringing upon several provisions of the EU GDPR shall not exceed the fine for the gravest infringement. A83.3.</p>		
<p>Infringements of the following provisions shall be subject to administrative fines of 10,000,000 EUR or, in the case of an undertaking, up to 2 percent of total worldwide annual turnover the preceding financial year, whichever is higher:</p> <ul style="list-style-type: none"> • obligations of the controller and processor pursuant to Articles 8, 11, 25 to 39 and 42 and 43; • obligations of a certification body pursuant to Articles 42 and 43; • obligations of the monitoring body pursuant to Article 41(45). A83.4. 			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Infringements of the following provisions shall be subject to administrative fines of 20,000,000 EUR or, in the case of an undertaking, up to 4 percent of total worldwide annual turnover the preceding financial year, whichever is higher:</p> <ul style="list-style-type: none"> • base principles for processing, including conditions for consent pursuant to Articles 5, 6, 7, and 9; • data subjects' rights pursuant to Articles 12 to 22; • transfer of personal data internationally pursuant to Articles 44 to 49; • non-compliance with an order or limitation on processing or suspension of data flows by the supervisory authority. A83.5. 			
<p>Non-compliance with an order by a supervisory authority shall be subject to administrative finds up to 20,000,000 EUR or, in the case of an undertaking, up to 4 percent of total worldwide annual turnover the preceding financial year, whichever is higher. A84.6.</p>			
<p>Member states may decide whether and to what extent administrative fines may be imposed on public authorities. A83.7.</p>			
<p>The exercise of supervisory authority powers shall be subject to appropriate procedural safeguards in accordance with EU and member state law, including judicial remedy and due process. Imposes other requirement pertaining to administrative fines by member states. A83.8.9.</p>			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Penalties Member states have the authority to issue penalties beyond the EU GDPR administrative penalties. A84.</p>			
<p>IX. PROVISIONS RELATING TO SPECIFIC PROCESSING SITUATIONS</p>			
<p>Processing and freedom of expression and information Allows member states to reconcile the right to protection of personal data with the right to freedom of expression and information. A85.</p>			
<p>Processing and public access to official documents Allows member states to reconcile public access to official documents with the right to protection of personal data. A86.</p>			
<p>Processing of national identification number Allows member states to permit processing of a national identification number provided there are appropriate safeguards for the rights and freedoms of data subjects. A87.</p>			
<p>Processing in the context of employment Allows member states to provide more specific rules to protect processing of employees' personal data in employment context with a requirement for safeguards. A88.</p>			
<p>Safeguards for archiving in public interest Requires safeguards for processing for archiving purposes in the public interest, scientific, historical research or statistical purposes. A89.1.</p>			
<p>Allows member states to provide for derogation of rights when such personal data processing rights are likely to render impossible or seriously impair achievement of scientific, historical research or statistical purposes provided there are safeguards. A89.2.</p>			

	European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
Obligations of secrecy	Allows member states to adopt specific rules pertaining to the powers of a supervisory authority with regard to an obligation of professional secrecy on the part of controllers and processors and to reconcile right to protection of personal data with the obligation of secrecy. A90.			
Existing data protection rules of churches and religious associations	Relates to application of the EU GDPR to churches and religious associations. A91.			
X. DELEGATED ACTS AND IMPLEMENTING ACTS				
Exercise of delegation	Delegated acts conferred on European Commission. A92.			
Committee procedure	Administration. A93.			
XI. FINAL PROVISIONS				
Repeal of Directive 95/46/EC	Specific to EU. A94.			
Relationship with Directive 2002/58/EC	Specific to EU. A95.			
Relationship with previously concluded Agreements	Specific to EU. A96.			
Commission reports	EU administration. A97.			
Review of other Union legal acts on data protection	Specific to EU. A98.			

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Entry into force and application Specific to EU. A99.</p>			
<p>OTHER PROVISIONS</p>			
<p>Compliance with other laws</p>	<p>California’s Consumer Privacy Law does not affect compliance with other federal, state or local laws or civil, criminal, or regulatory inquiries, investigation, or subpoenas or summons issues by federal, state or local authorities or cooperation with law enforcement agencies. Nor does this law affect consumer information that is de-identified or in the aggregate or if every aspect of collecting or selling the personal information takes place wholly outside California. Section 3, 1798.145(a).</p>		<p>This policy does not affect compliance with other federal, state or local laws or civil, criminal, or regulatory inquiries, investigation, or subpoenas or summons issues by federal, state or local authorities or cooperation with law enforcement agencies.</p>
<p>- Evidentiary privilege</p>	<p>A consumer’s rights to disclosure, no sale and non-discrimination shall not apply where compliance would violate an evidentiary privilege. Section 3, 1798.145(b).</p>		
<p>-Health</p>	<p>California’s Consumer Privacy Law shall not apply to protected health information. Section 3, 1798.145(c).</p>		
<p>-Credit</p>	<p>California’s Consumer Privacy Law shall not apply to personal information sold to generate a consumer report and use of that information is limited by the Fair Credit Reporting Act. Section 3, 1798.145(d).</p>		
<p>-Financial</p>	<p>California’s Consumer Privacy Law shall not apply to personal information collected, processed, sold, or disclosed pursuant to Gramm-Leach-Bliley Act. Section 3, 1798.145(e).</p>		
<p>-Driver’s privacy</p>	<p>California’s Consumer Privacy Law shall not apply to personal information collected, processed, sold, or disclosed pursuant to the Driver’s Privacy Protection Act. Section 3, 1798.145(f).</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Responding to consumer request</p>	<p>A time period for a business to respond to any verified consumer request may be extended up to 90 additional days where necessary, taking into account the complexity and number of requests. The business shall inform the consumer of any such extension with 45 days of the request, including the reasons for the delay. Section 3, 1798.145(g)(1).</p> <p>If the business does not take action on the request of the consumer, the business shall inform the consumer, without delay, of the reasons for not taking action and any rights the consumer may have to repeal. Section 3, 1798.145(g)(2).</p> <p>If requests from a consumer are manifestly unfounded or excessive, particularly because of their competitive nature, a business may either charge a reasonable fee or refuse to act and notify the consumer of such. The burden is on the business to demonstrate any such request is manifestly unfounded or excessive. Section 3, 1798.145(g) (3).</p>		
<p>Liability</p>	<p>A business that discloses personal information to a service provider shall not be liable if the service provider receiving personal information from the business uses it in violation of restrictions set forth in the California Consumer Privacy Law if the business does not have actual knowledge, or reason to believe, that the service provider intends to commit such a violation. Section 3, 1798.145(h).</p>		
<p>Construing Consumer Privacy Law</p>	<p>California's Consumer Privacy Law shall not be construed to a business to re-identify or otherwise link information that is not maintained in a manner that would be considered personal information. Section 3, 1798.145(j).</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<p>Consumer Privacy Law's relationship to other rights</p>	<p>The rights afforded to consumers and the obligation imposed on the business by the California Consumer Privacy Law shall not adversely affect the rights and freedoms of other consumers. Section 3, 1798.145(j).</p>		
<p>Civil action for security violations</p>	<p>Any consumer whose nonencrypted or nonredacted personal information is subject to unauthorized access and exfiltration, theft or disclosure as a result of the business's violation of the duty of to implement and maintain reasonable security practices may institute a civil action to recover damages (not less than \$100 or greater than \$750 per incident or actual damages, based on circumstances, whichever is greater, injunctive or declaratory relief, or any other relief the court deems proper. Section 3, 1798.150(a).</p> <p>Requirements to bring civil action for security violations. Section 3, 1798.150(b).</p> <p>Relationship of civil action for security violations to other laws and other duties or obligations. Section 3, 1798.150(c).</p>		<p>Any road usage charge payer whose personal information is subject to unauthorized access and exfiltration, theft or disclosure as a result of the business's violation of the duty of to implement and maintain reasonable security practices may institute a civil action to recover damages not less than \$XXX or greater than \$XXX per incident or actual damages, based on circumstances, whichever is greater, injunctive or declaratory relief, or any other relief the court deems proper.</p>
<p>Civil action brought by Attorney General</p>	<p>Any business or third party shall be in violation of the California Consumer Privacy Law for failing to cure any alleged violation within 30 days after notification of alleged noncompliance and therefore liable for civil penalty in an action brought by the Attorney General. Section 3, 1798.155(a).</p> <p>Any person, business or service provider that intentionally violated the California Consumer Privacy Law shall be liable for a civil penalty of up to \$7,500 for each violation but may be adjusted as necessary to ensure the costs incurred by the state and Attorney General are covered. Section 3, 1798.155(b)(d).</p>		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
	Allocation of civil penalty. Section 3, 1798.155(c).		
Consumer Privacy Fund	The Consumer Privacy Fund is created to offset any cost incurred by Attorney General in carrying out duties under the California Consumer Privacy Law. Section 3, 1798.160		
Application of this law	The California Consumer Privacy Law applies to collection and sale of all personal information collected by a business from consumers and is not limited to information collected electronically over the Internet. Section 3, 1798.175.		
Preemption of local law	The California Consumer Privacy Law is a matter of statewide concern and preempts all rules, regulations, codes, ordinances, and other laws adopted by a city, county, municipality, or other local agency. Section 3, 1798.180.		
Regulations	The Attorney General shall solicit broad public participation to adopt regulations on or before January 1, 2010. Section 3, 1798.185.		The authorized agency shall solicit broad public participation to adopt regulations on or before the operative date for this policy.
Attempts to avoid the reach of this law	If a series of steps or transactions were component parts of a single transaction intended to avoid the reach of the California Consumer Privacy Law, a court shall regard the intermediate steps or transactions. Section 3, 1798.190.		If a series of steps or transactions were component parts of a single transaction intended to avoid the reach of this policy, a court shall regard the intermediate steps or transactions.
Inapplicability of waiver	Any provision in a contract that purports to waive or limit consumer rights under the California Consumer Privacy Law shall be void and unenforceable. Section 3, 1798.192.		Any provision in a contract that purports to waive or limit road usage charge rights under this policy shall be void and unenforceable.
Construction of this law	The California Consumer Privacy Law shall be liberally construed to effectuate its purposes. Section 3, 1798.194.		

European Union General Data Protection Regulation	California Consumer Privacy Act of 2018 (Title 1.81.5)	Oregon Road Usage Charge Program (OReGO) Privacy Protection Provisions	Model RUC Privacy Policy for US States
<i>Preemption by federal law or California Constitution</i>	The California Consumer Privacy Law is intended to supplement federal and state law but shall not apply if such application is preempted by, or in conflict with, federal law or the California Constitution. Section 3, 1798.196.		
<i>Operative date</i>	The California Consumer Privacy Law becomes operative January 1, 2020. Section 3, 1798.198.		



A-7

USE OF ROAD USAGE CHARGE REVENUE

 **WA RUC**



Use of Road Usage Charge Revenues |



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1 INTRODUCTION

This paper examines alternative approaches for using revenues from a road usage charge (RUC). Should the Legislature enact RUC, it must specify allowable uses for the revenue collected in legislation. This paper serves as an input to deliberations and decision making; therefore, it does not put forward any preferences or recommendations.

This paper does not assume any constitutional, statutory, or regulatory constraints on possible alternatives. A companion paper addresses legal issues associated with use of RUC revenues, specifically those emanating from the 18th Amendment to the Washington constitution. Instead, this paper focuses on the range of policy possibilities.

The choice of how to use RUC revenues is a policy decision about the *application* of RUC, not the mechanism itself. However, the RUC Steering Committee may choose to make recommendations to the Commission about both the application and the mechanism of RUC.

We present two dimensions of decisions the Legislature will confront related to the use of RUC revenues.

- ▶ The Legislature must decide the types of expenditures allowable for RUC revenues, and specify them in statute
- ▶ The Legislature must specifically decide whether and how to treat funding of existing “non-highway” recipients of gas tax revenues under a long-term transition away from gas taxes and toward RUC

Following this section, Section 2 summarizes the current collection and allocation of transportation revenues in Washington. Section 3 presents a range of alternatives for using RUC revenues, from flexible to narrow, and arguments for and against each one. Section 4 presents the existing non-highway recipients of state gas tax revenues and the alternatives for addressing their needs under a RUC system. Section 5 summarizes the two key dimensions and the alternatives available to the Legislature.

2 SOURCES AND USES OF WASHINGTON TRANSPORTATION REVENUE

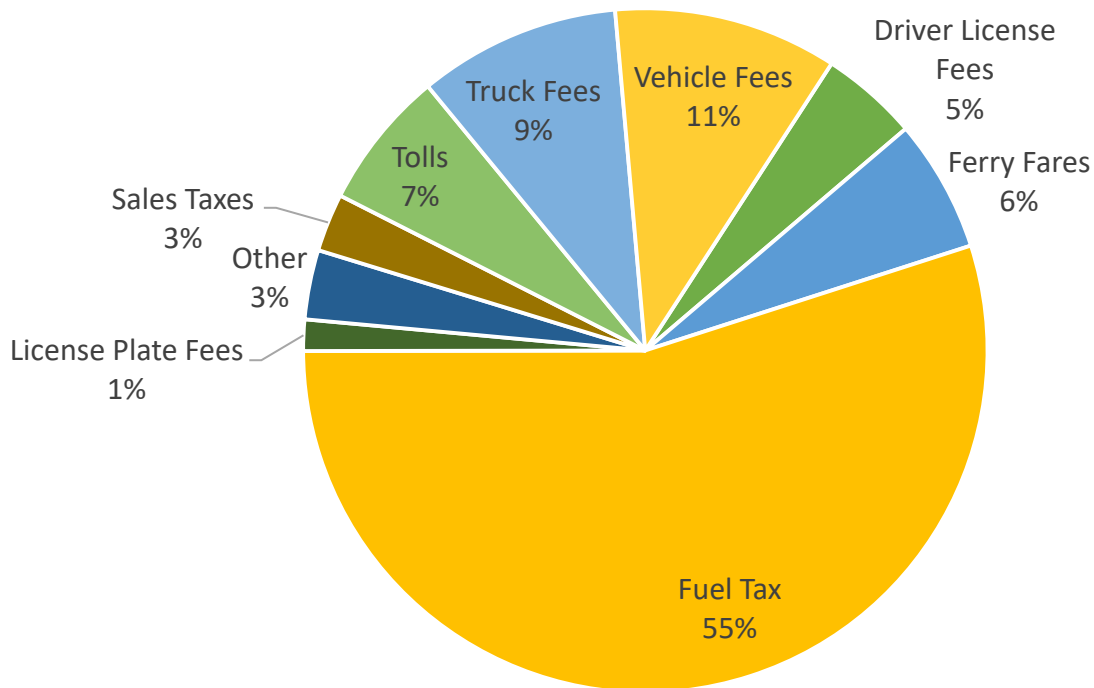
This section summarizes sources and uses of state transportation revenues in Washington. The federal government and local governments (counties, cities, and special purpose agencies such as transit authorities) also collect some revenues from transportation users and allocate funds to transportation uses; however, since the state has little authority over the sources and uses of those funds, they are treated separately for this paper.

2.1 Sources of transportation revenue in Washington¹

For the 2017-2019 biennium, the State of Washington estimates it will collect approximately \$6.2 billion in revenues from transportation-related taxes and fees. The pie chart below summarizes the components of this revenue total. Fuel taxes compose the majority of state revenues, at 55%.

¹ All information in this section is drawn from data in the January 2017 *Transportation Resource Manual* of the Washington Joint Transportation Committee.

Breakdown of Washington State Transportation Revenue Sources 2017-2019



The federal government also collects revenue from Washington residents and businesses through transportation taxes, including federal fuel taxes and heavy vehicle taxes. For the 2015-2017 biennium, the federal government attributed just over \$1.5 billion of federal transportation revenue to Washington.

Local governments in Washington also collect revenue from Washington residents and businesses through transportation taxes and fees, including transit fares and vehicle excise taxes. Although no authoritative source of data exists, we estimate the aggregate amount derived from transportation-specific local government taxes and fees at approximately \$2.3 billion per biennium. This includes about \$1.2 billion in property tax road levy, \$600 million in transit farebox collections, and \$150 million in Sound Transit motor vehicle excise tax.

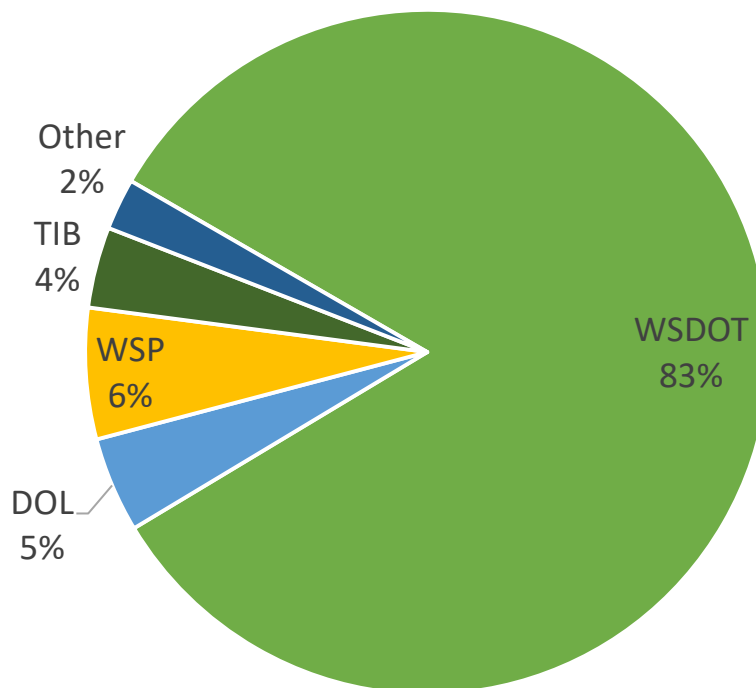
Local governments in Washington also collected revenue from sales taxes, property taxes, and other taxes and fees. Although local governments devote a substantial portion of these general fund revenues to transportation uses, they do not constitute transportation revenue sources. Likewise, the federal government

has allocated over \$60 billion of general fund revenues to the Highway Trust Fund over the past 15 years. By contrast, the state government has not recently devoted any general fund revenues to transportation, relying exclusively on revenue from assessing taxes and fees on transportation consumption and assets as described above.

2.2 Uses of transportation revenue in Washington

The chart below summarizes expenditures by agency, showing the majority (83%) of state transportation revenues expended by the Washington State Department of Transportation (WSDOT). Washington State Patrol (6%), Department of Licensing (5%), and Transportation Improvement Board (4%) are the only other agencies receiving more than 1% of revenue.

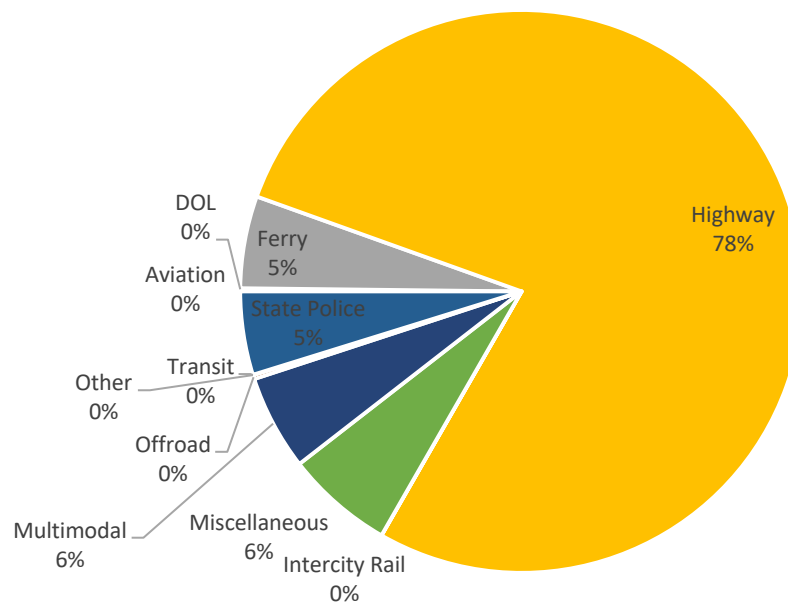
Breakdown of Washington State Transportation Expenditures by Agency, 2015-2017



The chart below summarizes expenditures in Washington (including state and federal funds, but not local funds), by type of expenditure. With the majority (78%) of state expenditures devoted to highway uses (which includes expressways,

roads, and streets, including county and city facilities),² 5% to ferries, 5% to state police. Arguably close to 90% of expenditures support highways directly or indirectly. A further 6% of expenditures support a multi-modal transportation funding program, with another 6% for the WSDOT miscellaneous account, which represents cost-reimbursable expenditures by the agency.

Breakdown of Washington State Transportation Expenditures by Type, 2015-2017



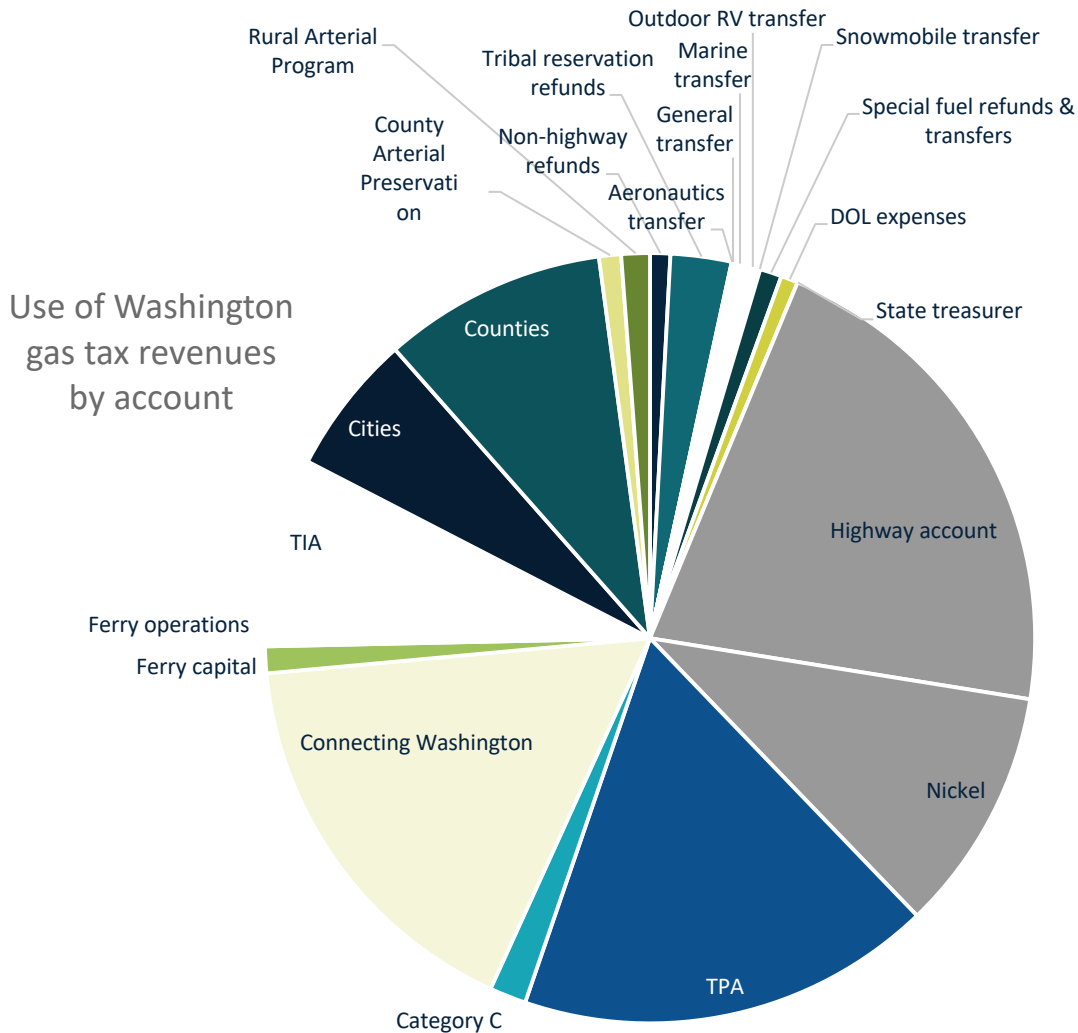
Nearly all transportation revenues collected by the state feature a constitutional and/or statutory restriction on usage. Likewise, nearly all transportation expenditures by the state derive from a constitutional and/or statutory specification on allowable sources for the expenditure. As discussed in the companion paper on the 18th Amendment and RUC, the Washington constitution specifically restricts revenue from fuel taxes and vehicle license fees to highway purposes. Other sources of revenue such as driver license fees are restricted to specific uses by statute. Federal funds are restricted by federal law, primarily to highway projects, with funding directed by the state, and to transit capital projects, with funding directed by local agencies. Local government revenues and expenditures feature

² Throughout this paper, the term “highway” refers to all public roadways in the state.

fewer restrictions, with general taxes (property and sales taxes) constituting the primary sources of revenue for expenditures at the local level.

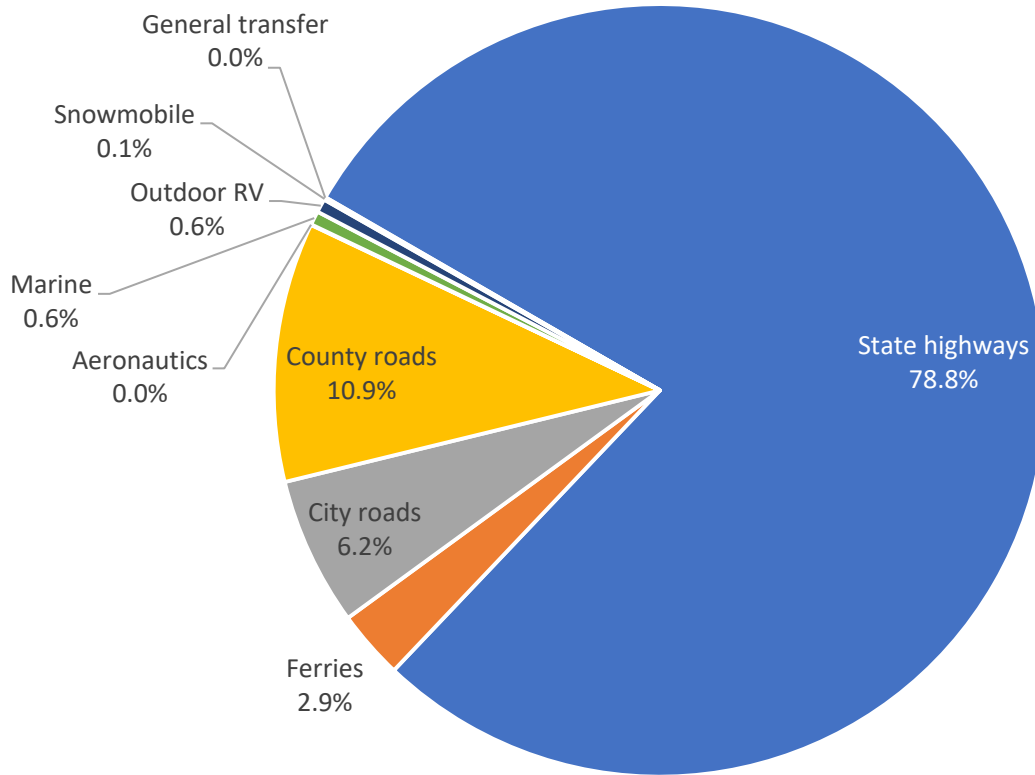
2.3 Uses of the state gas tax in Washington

Since the Legislature indicated its intent for RUC as a potential replacement for gas taxes, we explore in detail the current uses of state gas taxes. The chart below illustrates the breakdown of how the state expends gas tax revenues.



The chart below summarizes expenditures of gas tax revenues in fewer categories, by mode rather than by account.

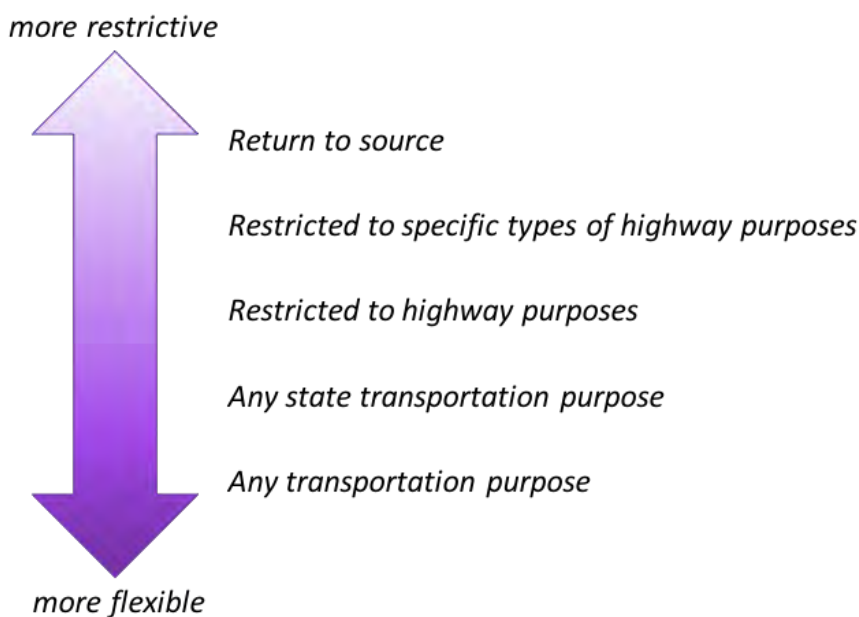
Use of Washington state gas tax revenues by mode



3 ALTERNATIVES FOR ALLOCATION OF RUC REVENUE

This section presents alternatives for allocating RUC revenue. The alternatives are presented without any caveats about legal restrictions or other current policies that may dictate how revenues could or should be used. Although such restrictions may impact the ultimate choice of how to allocate RUC revenues, they do not constrain the exploration of policy possibilities.

A spectrum of potential alternatives to allocate RUC revenue exists, ranging from more flexible to more restrictive. The most flexible use of RUC revenues is to dedicate them to transportation with no use limitation placed on it. The most restrictive use of RUC revenue is to “return to source,” which would be the theoretical extreme case of allocating funds precisely back to the road segments from which they were collected. The current approach for allocating state fuel taxes (for which the Legislature has indicated its intent to use RUC as a potential replacement revenue source), is to restrict expenditures to highway purposes, per the 18th Amendment to the state constitution. This approach lies somewhere between the two extremes. The graphic below summarizes the range of potential approaches.



3.1 Restrict RUC revenues to any transportation use

Under this alternative, RUC would be allocated by the Legislature to any transportation use, at all levels of government within Washington, including local transportation agencies (cities, counties, and transit agencies) and statewide needs. This approach uses RUC as a revenue source for multi-modal investment decisions, which consider all forms of transportation (highways, transit, rail, and non-motorized forms) as part of an overall analysis, planning, and decision making process, rather than as distinct modes analyzed separately and budgeted individually.

Arguments For	Arguments Against
<p>Could invite support for RUC by stakeholder groups advocating for transit, rail, and non-motorized modes</p>	<p>Spending RUC revenues on local and non-highway transportation would erase state precedent and upset motorists who see the Legislature’s original intent of RUC as a potential gas tax replacement</p>
<p>Using RUC revenues for non-motorized modes to reduce emissions could offset the potential perception that removing gas taxes incentivizes fossil fuel consumption</p>	<p>RUC would require higher rates to generate enough revenue to address needs beyond highways; if rates remain commensurate with the gas tax and revenues are allocated to other modes, fewer funds would be available for roads, leading to underinvestment and greater backlogs of maintenance needs</p>
<p>Increasing revenues for a multi-modal investment account allows the Legislature and state agencies to conduct a more holistic trade-off analysis when considering investment alternatives (e.g., roads, transit, rail, highways, non-motorized)</p>	<p>Using RUC for non-highway purposes, especially at the local level, could put pressure on state and local officials to reduce other taxes to offset the new contribution from state RUC revenues</p>
<p>Local agencies would have less pressure to devote local general source revenues to transportation uses</p>	<p>This use of RUC revenues would require a restructured evaluation and prioritization process for comingling funds from across modes and levels of government.</p>

3.2 Restrict RUC revenues to any state transportation use

Under this alternative, RUC would be allocated by the Legislature to any transportation use, at the state level. This approach uses RUC as a revenue source for multi-modal investment decisions, but to a much lesser extent than in the first option since most multi-modal investments presently occur at the local

level. Nonetheless, the state would need to consider multiple modes of transportation (highways, inter-city rail, rural transit, and non-motorized modes) as part of an overall analysis, planning, and decision making process, rather than as distinct modes analyzed separately and budgeted individually. Many of the arguments for and against this approach, presented in the table below, are similar to those presented in the first alternative.

Arguments For	Arguments Against
<p>Could invite support for RUC by stakeholder groups advocating for transit, rail and non-motorized modes, although the state-level investments are modest compared to local levels</p>	<p>Spending RUC revenues on non-highway transportation would erase state precedent and upset motorists who see the Legislature’s original intent of RUC as a potential gas tax replacement</p>
<p>Using RUC revenues for non-motorized modes to reduce emissions could offset the potential perception that removing gas taxes incentivizes fossil fuel consumption</p>	<p>RUC would require higher rates to generate enough revenue to address needs beyond highways; if rates remain commensurate with the gas tax and revenues are allocated to other modes, fewer funds would be available for roads, leading to underinvestment and greater backlogs of maintenance needs</p>
<p>Increasing revenues for a multi-modal investment account allows the Legislature and state agencies to conduct a more holistic trade-off analysis when considering investment alternatives (e.g., roads, transit, rail, highways, non-motorized)</p>	<p>Using RUC for non-highway purposes could put pressure on state officials to reduce other taxes to offset the new contribution from state RUC revenues</p>
<p>The transport modes supported by state spending do not require substantial amounts of investment, so the impact of using RUC to support them would be modest</p>	<p>This use of RUC revenues would require a restructured evaluation and prioritization process for comingling funds from across modes and levels of government.</p>

3.3 Restrict RUC revenues to highway purposes

This is the current approach to allocating gas tax revenues. Under the 18th Amendment to the Washington constitution, revenues from fuel taxes are

specifically restricted to highway purposes (including state, county, and city highways, bridges, roads, and streets). The Legislature also directs gas tax revenues to various highway-oriented accounts in statute. Some “edge cases” have also been adjudicated in the courts as discussed in the companion paper on the 18th Amendment. Section 4 discusses a few exceptions to the highway use requirement.

Arguments For	Arguments Against
Emphasizes RUC as a revenue tool and focuses policy discussion around the mechanism rather than the use of revenues	Some existing non-highway recipients of gas taxes may lose their nexus and thus justification for receiving revenues (see Section 4 for more discussion)
Preserves status quo; if RUC proves a more sustainable revenue source, current recipients of gas tax revenues would receive more sustainable revenue over time than they do under current policy	Comparing the revenues from RUC with existing spending approaches and formulas could highlight the existing inequity between urban and rural areas, causing concern about funding formulas (namely, that rural areas receive more funding for highways than those highways produce in usage fees)
Opportunity to tie rate setting to highway needs more directly given the relationship between road usage and resource (revenue) needs	In relying purely on existing mechanisms, this approach does not take advantage of information inherent in RUC revenues that could potentially inform investment decisions

3.4 Restrict RUC revenues to specific types of highway users or expenditure categories

This approach is similar to the status quo, but would be more restrictive in that it ties RUC revenues to a specific category of highway spending rather than highway purposes generally. The Legislature could choose many specific uses at its

discretion. For example, it could dedicate RUC revenues exclusively to maintenance and operations, or exclusively to capacity improvement projects. Alternately, it could choose to dedicate revenues to a class of vehicles; for example, if the Legislature only applies RUC to electric vehicles (EVs), it could dedicate some or all of the RUC revenues to infrastructure around public EV charging stations.

Arguments For	Arguments Against
<p>Could remove potential for lack of clarity around the use of RUC revenues by prescribed a specific category of allowable highway uses</p>	<p>Some existing non-highway recipients of gas taxes may lose their nexus and thus justification for receiving revenues (see Section 4 for more discussion)</p>
<p>Opportunity to tie rate setting to a specific category of highway needs (such as basic maintenance and operations) more directly given the relationship between road usage and certain categories of needs</p>	<p>Assumes additional revenue sources (such as the gas tax and vehicle registration fees) remain in place to fund other highway purposes, which sets up a potential longer term and potentially ongoing debate about how to fund those other purposes as gas tax revenues decline</p>
<p>Despite increased specificity, this approach preserves the user pay principle of the status quo</p>	<p>Establishes expectations and assumptions about the use of RUC revenues that may be difficult to overcome in the future should the revenues grow and exceed the budget needed for its prescribed use and/or become desirable to allocate to other uses</p>

3.5 Return RUC revenues to source

The most restrictive possible use of RUC revenues is the concept of allocating revenues specifically to the facilities from which they were collected, or “return to source.” Conceptually, this approach is similar to tolling in that it applies revenue

collected on a specific facility, corridor, segment, or part of the network to maintenance and improvements in that very facility, corridor, segment, or part of the network. The specificity with which the state chooses to define the geographies could vary. A coarse level would be to return revenues to districts within the state. A fine level would be to return revenues to segments of the state, county, and city road networks, for example mile by mile. A middle ground would be to return revenues to counties.

This approach requires information about the number of miles traveled and amount of revenue collected in each geographic sub-unit so that the funds collected can be applied precisely back to the location they were collected from drivers. With the RUC reporting methods being tested in WA RUC, only slightly over 50% of volunteers chose a reporting method with GPS which would technically allow information to be collected at the level of detail necessary to support returning revenue to source. Furthermore, the state is not allowed to access the information for individuals, so obtaining this information would require exceptions for aggregated information about the amount of road usage by location, unless the state relied on traditional traffic count methods for the information.

Potential Arguments in Favor	Potential Arguments Against
<p>The potential exists in theory to better align resources to needs, although with less flexibility</p>	<p>This approach would very likely result in decreased highway investment in most rural areas, as sparsely traveled areas of the network cannot muster sufficient resources from RUC alone to make meaningful investments in roadways</p>
<p>This approach tends to focus investments on congested bottlenecks where the majority of revenues would be generated</p>	<p>Unless a corridor viewpoint is taken, this approach could result in the loss of long-distance linkages with neighboring states as the focus turns inward to a local perspective; an exception could be heavily traveled freight corridors which generate sufficient revenues for adequate maintenance</p>
<p>This approach would increase levels of spending in urban and suburban areas of the road network given that such areas currently receive less funding than they contribute; this could improve the likelihood of addressing congestion and mobility challenges in urban and suburban areas</p>	<p>Lesser potential for development in remote regions; on the other hand, should the sub-units be carefully designed such that re-investment balances the needs of urban/high-density and rural/low-density areas within each sub-unit, then investments could be balanced to sustain the network as a whole</p>
<p>Some regions with high volumes of through traffic would see windfalls, such as densely-traveled corridors</p>	<p>Absent protections for rural areas, this approach could force smaller and more rural authorities to rely on general revenues for transportation to make up for low volumes and low RUC revenues relative to current gas tax allocations, putting pressure elsewhere on municipal budgets</p>

4 EXISTING NON-HIGHWAY RECIPIENTS OF GAS TAX REVENUE UNDER A RUC

Regardless of the type of expenditures to which the Legislature decides to allocate revenues under a potential RUC, another issue the Legislature must confront is how the allocations align relative to existing non-highway recipients of gas tax revenues. The gas tax currently provides revenue to a variety of uses as summarized in the table below (the table does not include gas tax revenues allocated to cover collection costs or refunded for non-highway uses).

Expenditure category of gas tax revenue	Amount (2015-2017 biennium) (millions)
State highways, bridges, roads, streets	\$2,429
Ferries	\$89
County highways, bridges, roads, streets	\$335
City highways, bridges, roads, streets	\$192
Aeronautics	<\$1
Marine	\$18
Outdoor recreational vehicles	\$18
Snowmobiles	\$2
General fund	\$1

State, county, and city highways, bridges, roads and streets. The logic of using gas tax revenues for state, county, and city highways is straightforward given that the revenues are collected on fuel consumed by road users on those

facilities. A similar logic applies to RUC to justify use of RUC revenues for highway purposes.

The other expenditure categories also have a nexus with gas taxes as explained below. By contrast, most of them have little or no obvious nexus with a potential RUC. The remainder of this section explores possibilities for addressing these expenditure categories under a RUC policy.

Aeronautics. Under the gas tax, a small amount of tax is collected on gasoline used in light aircraft (unlike larger planes and commercial aircraft, which use jet fuel, which is taxed at a different rate and for a different purpose). This provides a nexus for expending some gasoline taxes on aviation purposes. Under RUC, there would be no such nexus, except for possibly the amount of mileage driven by vehicles on airport properties, assuming RUC would apply to miles on such property. The amount of usage by such vehicles likely would be much smaller than the amount currently allocated to aeronautics, which represents taxed gasoline used in light aircraft.

Marine. As with aviation, the nexus for marine expenditures is the use of tax-paid (and non-refunded) gasoline in vessels. A similar nexus would not exist under a RUC, except for possibly the amount of mileage driven by vehicles on port and marine-oriented properties and off road. The amount of road usage by such vehicles would generate far less revenue than currently devoted to marine uses.

Outdoor recreational vehicles. Consumers of gasoline off-road may apply for and receive a refund for the associated gas taxes they paid. Many do not apply for these refunds, so the Legislature provides a small amount of gas tax revenue to support expenditures related to off-road vehicle use. Under a RUC, there could be a similar nexus to support off-road uses. For drivers who choose to report and pay RUC for all miles traveled, they would not benefit from exemptions or refunds for miles driven off road or on private property. Assumptions about the quantity of such travel could be used to justify allocating a portion of RUC revenues for expenditures in support of off-road vehicle usage, as is done under the gas tax today.

Snowmobiles. Many consumers of gasoline in snowmobiles do not apply for refunds of gas taxes paid, so the Legislature provides a small amount of gas tax revenue to support expenditures related to snowmobiles. Such a nexus would not exist with RUC given that snowmobiles would not be subject to RUC.

Given that the gas tax is likely to remain in place for at least a decade or more during a transition period, RUC (and its smaller nexus with these non-highway expenditures categories) represents a low risk to these programs in the short term. The impact is further limited if RUC only applies to specific classes of vehicles, with the gas tax remaining in place for other classes. In the longer term, should the state move away from gas taxes, and regardless of what replacement revenue sources it pursues (e.g., RUC, sales taxes, vehicle fees), these existing non-highway recipients of gas tax revenues will face reduced funding.

5 SUMMARY

Should the Legislature pass RUC legislation, it must prescribe the use of revenues collected. In formulating this aspect of RUC policy, there are two dimensions to address: (1) what types of expenditures should RUC revenues support, and (2) should expenditures of RUC revenues address existing recipients of gas tax revenues who no longer have nexus.

For the first dimension, this paper has summarized a range of options. The Steering Committee may choose to make recommendations, indicate a preference, or simply forward the alternatives to the Commission for consideration. Ultimately the decision is for the Legislature. From most restrictive to most flexible, the alternatives are:

- ▶ Return RUC revenues to source
- ▶ Restrict RUC revenues to specific highway purposes
- ▶ Restrict RUC revenues to any highway purposes, consistent with gas tax uses
- ▶ Allow RUC revenues to be spent on any state transportation purpose
- ▶ Allow RUC revenues to be spent for any state or local transportation purpose

For the second dimension, this paper has summarized a range of constituencies whose nexus is reduced or eliminated in a transition from gas tax to RUC. As long as the state continues to collect gas taxes during a transition period (at least one decade) in a gradual transition to RUC for some or all types of vehicles, the non-highway recipients of gas tax revenues may continue to receive funding by that existing mechanism. In the longer term, these constituencies will see reduced revenues should the state eliminate the gas tax by choice or should consumers cease to consume and pay taxes on gas. They include the following:

- ▶ Aeronautics account
- ▶ Marine account
- ▶ Recreational accounts for off-road and non-highway vehicles
- ▶ Snowmobile account

The Steering Committee may choose to make recommendations, indicate a preference, or simply forward the information to the Commission for consideration regarding whether to use RUC revenues to address reduced gas tax revenues of these non-highway recipients, and if so whether to restrict the allocation of RUC revenues to these accounts to the extent a nexus exists, as is done with the gas tax today. The choices are:

- ▶ Ensure existing recipients of gas tax funds remain whole by allocating RUC revenues to them
- ▶ Ensure existing recipients of gas tax funds continue to receive funding commensurate with their nexus under a RUC, which in all cases would be substantially lower than under the gas tax
- ▶ Do not consider allocating RUC revenue to non-highway use accounts for which no nexus exists, or the nexus is negligible





A-8

**RUC & AMENDMENT 18 OF THE
WASHINGTON CONSTITUTION**

 **WA RUC**



RUC and Amendment 18 of the Washington Constitution |



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PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee’s consideration as they begin to deliberate whether or how the State of Washington could transition to a per-mile fee system as a future replacement for the state’s motor fuels tax (gas tax).

The information contained in this report examines various options for how a road usage charge (RUC) could be implemented in a way that retains the two most distinctive legal features of the current gas tax: that RUC expenditures be used exclusively for “highway purposes;” and that RUC revenue can be bonded outside of the constitutional debt limit.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on November 29, 2018.

For this report, all footnotes and citations appear at the bottom of the page to improve readability.

EXECUTIVE SUMMARY

The issue addressed in this report is not *whether* road usage charges (RUC) should be restricted for highway expenditures, but rather *how* RUC could be subject to such expenditure restrictions, particularly as provided in Amendment 18 of the Washington Constitution. The rationale for exploring this is rooted in the original legislative directive given to the Steering Committee: that RUC be investigated as a future replacement for the state’s motor fuels tax (“gas tax”). If RUC is to eventually replace the gas tax, the issue presented is how closely could RUC mimic the same revenue characteristics as the gas tax it is designed to replace.

Amendment 18 requires gas taxes, motor vehicle license fees, and other revenue intended for highway purposes to be placed into a special fund (i.e., the state Motor Vehicle Fund) and the proceeds expended exclusively for highway purposes.¹ In 1944, the voters ratified Amendment 18 in response to a growing reliance by government to use these revenues to bolster the state’s general expenditures, rather than using them to help fund construction and maintenance of the public roadway system as originally intended when the taxes were enacted.

There are two types of tax and fee revenue subject to Amendment 18’s spending restrictions: enumerated revenues, which are the state gas tax and the state vehicle license fee; and “categorical” revenues, which is term used in reference to Amendment 18’s inclusion of “all other state revenue intended to be used for highway purposes.” Both types of revenue must be deposited into the Motor Vehicle Fund where expenditures are restricted. However, only the two enumerated revenues receive favorable treatment under state law for borrowing purposes; gas taxes and vehicle license fees can be pledged for the repayment of bonds with additional assurance (backing) by the state’s full faith and credit, without being subject to the state limit on bonded indebtedness. This issue will be more fully analyzed in a separate report in early 2019.

There are several ways in which the expenditure of RUC revenue can be restricted to highway purposes. First, RUC could be structured and implemented

¹ Throughout this paper, the term “highway” refers to all public roadways in the state.

as a vehicle license fee. This approach was first outlined by the Office of the State Treasurer in September 2014. This approach is probably the most certain methods for restricting RUC revenue, outside of a voter-approved Constitutional amendment adding RUC as an enumerated revenue under Amendment 18.

A second approach to restricting expenditures of RUC for highway purposes is to statutorily designate RUC as a revenue “intended to be used exclusively for highway purposes,” so that RUC is enacted as a “categorical revenue” as provided for in Amendment 18, requiring the deposit of proceeds into the Motor Vehicle Fund where all expenditures must be made for highway purposes. The combination of specific legislative intent language that mirrors Amendment 18, with the statutory directive to place the revenue in the Motor Vehicle Fund, is probably the next most reliable method for restricting use of RUC revenue.

A third approach, which has been taken by the Legislature in enacting numerous other taxes and fees that are now considered subject to Amendment 18, is to statutorily deposit the revenue into the Motor Vehicle Fund, creating the presumption of legislative intent. This approach might be considered slightly less “protective” because it lacks specific legislative findings and intent in the enactment of the revenue mechanism itself and relies on the statutory deposit of the revenue to meet the intent required under Amendment 18.

Other ways in which the expenditure of revenue can effectively be restricted is if the revenue (in this case, RUC) is pledged for the repayment of highway construction bonds. While this situation creates a legally binding contract between the State of Washington and bondholders that requires the continued use of RUC revenue to repay highway construction bonds, this is not recommended as a legislative drafting technique for the perpetual restriction of the revenue for highway purposes.

1 BACKGROUND AND OBJECTIVES

1.1 WA RUC Steering Committee interest in Amendment 18

The Legislature’s intent in authorizing investigation of a per-mile road usage charge (RUC) was to study the funding mechanism as a potential future replacement for the state’s motor fuel tax (“gas tax”).² With increases in vehicle fuel economy expected to accelerate in the coming decade, a transportation funding system that is almost entirely dependent on gasoline sales will face declining revenue per mile, drawing into question whether the current gas tax system of roadway funding is financially sustainable over the mid and longer term.

Very early in Washington’s assessment of RUC, the Steering Committee decided that its investigation of RUC would be limited to a “full replacement” scenario, consistent with the Committee’s understanding of their legislative charge. If a RUC someday replaces the current gas tax, policymakers must still confront what “replacement” of the gas tax means in the context of transportation fiscal policy. Below are some important characteristics of the state’s current gas tax. Ultimately, the Legislature will have to decide which of these to carry forward in any future RUC authorization:

- ▶ **Gas tax revenue can only be spent for highway purposes:** The gas tax is one of the revenue sources subject to Article II, Section 40 of the Washington Constitution (more commonly known as the 18th Amendment, hereafter Amendment 18). This provision requires subject taxes and fees to be spent “exclusively for highway purposes.”
- ▶ **Bonds that pledge the gas tax as a source of repayment are not subject to the state’s constitutional debt limit:** The Washington Constitution establishes a debt limit to regulate the amount of borrowing to be repaid from general state revenues.^{3,4} However, the constitutional

² 2012 Supplemental Transportation Budget, Chapter 86, Laws of 2012, at section 205, subsection (4),

³ See Const. art. VIII, Section 1(b), which provides the formula used to calculate the state’s 9% debt limit.

⁴ Const. art. VIII, Section 1(f) of the Washington Constitution provides that the state can pledge its full faith and credit to guarantee repayment of any obligation payable from Amendment 18 sources, and from interest on the common school fund. This provision has the effect of allowing gas tax bonds to be issued without regard for the state’s debt limit. The importance of this provision extends beyond transportation. If

debt limit exempts certain revenue sources, including gas tax revenues and motor vehicle license fees, since these are protected through “special fund” status.

- ▶ **Gas tax refunds are allowed to persons who use fuel for non-highway purposes:** Although the gas tax is owed by in-state “fuel licensees” and levied at the time the fuel is removed from a terminal rack (i.e., wholesale distribution level),⁵ the Legislature’s intent is that the tax ultimately be applied to the propulsion of vehicles driven on the highways of the state.⁶ To the extent that gasoline is used for non-highway purposes, the Legislature allows vehicle owners to apply for tax refunds.
- ▶ **Certain entities and uses are exempt from the gas tax:** State law specifically exempts taxation on the sale of fuel used by the state, cities, and counties for road construction or maintenance; fuel used in firefighting equipment; fuel sold to the federal government; fuel used by paratransit vehicles, trolleys, and other urban transport vehicles; and more.⁷

1.2 Objectives of this report

This report specifically examines how the Legislature could enact RUC legislation that mimics the first two gas tax characteristics above,⁸ which are restated in the following questions:

- ▶ How can a RUC be structured so that the revenue can only be spent on highway purposes?
- ▶ Can a RUC be structured so that the revenue is not calculated as part of the state’s constitutional debt limit?

these revenues were subject to the state’s debt limit – even if limited to highway purposes – bonds issued would have the effect of displacing borrowing capacity available for other state capital construction projects such as higher education facilities, parks, public buildings, etc. This subject will be fully addressed in the WA RUC policy paper related to state bonds 2019.

⁵ RCW 82.38.030(1)

⁶ RCW 82.38.010

⁷ RCW 82.38.080

⁸ The question of whether the gas tax exemptions and refunds can (or should) be carried forward in a future RUC system is addressed in other white papers or reports presented to the WA RUC Steering Committee.

Importantly, this report does not address whether restricting RUC expenditures to highway purposes is mandatory (or even desirable) transportation policy. That topic is examined in greater depth in a separate report to the Steering Committee (see, *Use of RUC Revenues*, November 2018). This report focuses on the “how” question -- not the “should” question -- of restricting revenues to highway purposes.

2 OPTIONS FOR RESTRICTING RUC REVENUES TO HIGHWAY PURPOSES

2.1 Enactment of Washington's Amendment 18

Before considering the available options for restricting RUC proceeds to highway purposes, it is helpful to first review exactly what Article II, Section 40 (Amendment 18) of the Washington Constitution provides and why it was enacted.

First, the full text of this provision⁹:

SECTION 40 HIGHWAY FUNDS. All fees collected by the State of Washington as license fees for motor vehicles and all excise taxes collected by the State of Washington on the sale, distribution or use of motor vehicle fuel and all other state revenue intended to be used for highway purposes, shall be paid into the state treasury and placed in a special fund to be used exclusively for highway purposes. Such highway purposes shall be construed to include the following:

- (a) The necessary operating, engineering and legal expenses connected with the administration of public highways, county roads and city streets;*
- (b) The construction, reconstruction, maintenance, repair, and betterment of public highways, county roads, bridges and city streets; including the cost and expense of (1) acquisition of rights-of-way, (2) installing, maintaining and operating traffic signs and signal lights, (3) policing by the state of public highways, (4) operation of movable span bridges, (5) operation of ferries which are a part of any public highway, county road, or city street;*
- (c) The payment or refunding of any obligation of the State of Washington, or any political subdivision thereof, for which any of the revenues described in section 1 may have been legally pledged prior to the effective date of this act;*
- (d) Refunds authorized by law for taxes paid on motor vehicle fuels;*
- (e) The cost of collection of any revenues described in this section:*

⁹ Const. art. II, Section 40, (amend. 18), 1943 House Joint Resolution No. 4, p 938. Approved November 1944.

Provided, That this section shall not be construed to include revenue from general or special taxes or excises not levied primarily for highway purposes, or apply to vehicle operator's license fees or any excise tax imposed on motor vehicles or the use thereof in lieu of a property tax thereon, or fees for certificates of ownership of motor vehicles.

2.2 History leading to the enactment of Amendment 18

Until the early 1900s, throughout the U.S. roads were mostly privately-funded endeavors, undertaken as private toll roads. Financially, these roadways only had modest success. Highly traveled road segments serving heavily populated areas tended to pay for themselves, but roadways that sought to connect towns of smaller populations were often financially infeasible. By the turn of the 20th century, the need to create roadways to ensure the delivery of farm products to market, and to allow widespread postal delivery became an important public need.

With the advent of the automobile and its growing importance as a viable form of daily transportation, automobile clubs sprung up in each of the states to lobby elected officials for public funding to construct and maintain roadways. In the early 1900s, state and local roadways were funded from property taxes, polls taxes, and a mix of other general tax revenues. But in 1919, Oregon became the first state in the nation to impose a gas tax of one cent, levied at the production level but with the intent that the tax be passed down through the retail chain to roadway users.

Soon after Oregon enacted the first gas tax, other states quickly followed suit. Within 10 years, every state had enacted some form of a gas tax. Although the tax rates were comparatively low (typically about one or two cents per gallon), the tax was a very effective revenue-generator for state and local governments. In fact, some governments had found the gas tax so productive that they diverted much of the proceeds to support large portions of their general government operations. Nebraska, for example, generated more than half its total state revenue from gasoline taxes alone; Georgia, Florida and Tennessee each relied on their gas

taxes to fund nearly half of all state spending. By 1939, only six states¹⁰ derived less than 20% of their total state revenues from gas taxes.

While states grew increasingly dependent on gas taxes and vehicle license fees to fund their general government operations, the need for new roadways was also becoming a pressing concern. Road-building could help put more people to work during the Great Depression, while also meeting the urgent requirements for better ways to move materials, supplies, equipment and soldiers throughout the country during a pending time of war.

In April 1941, President Roosevelt appointed the National Interregional Highway Committee to study the creation of a unique system of highways that would meet the immediate requirements of the War Department as well as the future needs of increased postwar traffic. This committee sent its report to Congress in January 1944 recommending the creation of a national highway system.¹¹

Back at the state level, road advocates – especially the influential automobile clubs – became more vocal in their protest against the growing reliance of state and local governments’ uses of gas tax revenue to support general government operations, instead of using the funds for roadways as originally intended. As the federal government began planning for construction of a national roadway network (which would require local matching funds from states), a movement began within the states to push for legal provisions requiring gas taxes to be expended only for highway purposes. In some states, measures were passed by the Legislature; in other states, these measures were placed on the ballot for voter approval.

By the 1940s, many Washington citizens shared these same concerns about diversion of their gas tax revenue for other purposes.¹² In November 1944, Washington voters ratified Amendment 18 to the state constitution to ensure the

¹⁰ The six states that used less than 20% of their gas tax revenue to support general government California, Massachusetts, Michigan, Missouri, New York and Pennsylvania. Washington Post article quoting Pittsburgh Press, May 21, 1939, courtesy of Google News.

¹¹ Congressional Research Service report, *Federal Aid to Roads and Highways Since the 18th Century: A Legislative History*, January 6, 2012, citing U.S. Congress, House, *Interregional Highways*, H.Doc. 379 (Washington: GPO, 1944), p. 214.

¹² *C.f.*, Laws of 1933, Ch. 8 and 65 (spending fuel excise tax revenue on unemployment relief).

availability of funds for the highway projects expected to be the key to post-World War II expansion and economic development.¹³ The official 1944 voters' pamphlet for Amendment 18 only contained arguments for the measure's approval, with the stated intent being to protect the money raised for the highways from other uses by the state general fund.¹⁴ Washington courts have consistently found that it was the express intent of the people to limit expenditures from motor vehicle fund revenues to those things that contribute to the safety, administration or operation directly or indirectly benefiting the highways.¹⁵

Washington is now one of 30 states that restrict the use of gas tax revenue for highway purposes only. Among these states, 22 restrict expenditures through provisions in their state constitutions, while eight accomplish this through statutes. The remaining 20 states allow at least a portion of their gas tax revenue to be used for other purposes, including Texas, which dedicates 25% of its gas tax revenue to the Permanent School Fund to support the public-school system.¹⁶

2.3 Types of revenues subject to Amendment 18

This report is not intended to explore whether different types of expenditures might qualify as a "highway purpose" under Amendment 18. Rather, the issue raised by the Steering Committee is whether RUC revenue can be construed or structured to fall within the purview of Amendment 18 so that its proceeds would be spent in the exact same manner as the gas tax it is intended to replace.

Amendment 18 applies to three types of revenue:

- ▶ License fees collected by the State for motor vehicles; and
- ▶ Excise taxes on the sale, distribution or use of motor vehicle fuel collected by the State; and
- ▶ All other state revenue intended to be used for highway purposes.

¹³ Utter and Spitzer, *The Washington State Constitution, A Reference Guide*, 2002, at page 73.

¹⁴ *Ibid*, at p. 73, (citing *1944 Washington State Official Voters Pamphlet*, 47).

¹⁵ *Washington State Highway Commission v. Pacific Northwest Bell Tel. Co* (1961) 59 Wash.2d 216.

¹⁶ National Conference of State Legislatures, *Surface Transportation Funding Options for States*, May 2006, at p. 24.

The first two types of revenue are specifically enumerated: motor vehicle license fees and an excise tax on motor vehicle fuel. The third type of revenue, “all other state revenue intended to be used for highway purposes,” is categorical.

2.3.1 Enumerated revenues

One effect of enumerating specific revenue sources is that changes in how these revenues are governed can only be made by amending the Washington Constitution itself.¹⁷ Legislation that attempts to alter the restrictions contained in Amendment 18 would be found unconstitutional unless those changes are approved by two-thirds vote of each chamber of the Legislature and presented to voters for their ratification or rejection by majority vote at a November general election. Thus, the level of approval required to alter the use of gas tax and vehicle license fee revenue is much higher than required for other revenue sources.

Given the level of public discord over how gas taxes and vehicle license fees were being used at the time for general government spending, it’s understandable why the drafters of Amendment 18 specifically called out these two revenue sources for restriction. Other states with similar restrictions, whether constitutional or statutory, tailored their restrictions to fit their own unique tax situation. Some states placed specific restrictions on the use of tire tax revenue, others toll revenue, and other taxes or fees that were being diverted away from highway spending.

2.3.2 Categorical revenues: “Other taxes or fees intended for highway purposes”

While the drafters of Washington’s Amendment 18 were principally concerned with halting the diversion of gas taxes and vehicle license fees, they also appeared to recognize that the Legislature might wish, at some point after the Amendment’s ratification in 1944, to extend these same expenditure restrictions to other taxes or fees intended to fund public highways. To accommodate this, the drafters created an entire category of revenue that would fall within the purview of Amendment 18:

¹⁷ A possible exception to this would be changes resulting from court rulings. However, no cases could be found where courts have altered the applicability of gas taxes, vehicle license fees, or other taxes intended for highway purposes under Amendment 18. In 75 years since its enactment, there have only been 14 cases related to Amendment 18, and most of these cases revolve around whether a proposed use of funds meets the definition of a “highway purpose.”

any tax or fee that the Legislature intended to be spent exclusively for the purpose of funding highways.

If certain taxes or fees were, in fact, used for highway purposes, the mere expenditure of the proceeds on highways would not be sufficient to place these revenues under the control of Amendment 18. The Legislature must create (or enact) the taxes or fees with the specific intention that they be dedicated exclusively for highway purposes. Presumably, this intention must be manifest in the exact wording of the tax or fee enabling statute; merely appropriating the proceeds for highway purposes is unlikely to be sufficient proof of the Legislature's intent that the revenue be perpetually restricted under Amendment 18¹⁸.

One important difference between enumerated revenue and categorial revenue is that since categorial revenues are created by statute, they could also be altered or repealed by amendments to the tax or fee mechanism's enabling statute (which, like other legislation, requires simple legislative majority vote). This stands in contrast with the legislative supermajority and voter approval requirements to alter how gas taxes and vehicle license fees are governed under Amendment 18.

2.4 Options for applying Amendment 18 to RUC revenues

2.4.1 RUC as a motor fuel tax

RUC is clearly not an excise tax on motor fuel. However, one design alternative is for RUC to be implemented as an "in lieu of" tax – that is, imposed specifically as an alternative form of financial contribution for highway purposes, in situations where the taxpayer is otherwise deemed not paying his or her proportionate share of the perceived benefits provided by government.¹⁹ In-lieu-of taxes are most

¹⁸ See *State ex rel. Heavy v. Murphy*, 138 Wn.2d 800 (Wash. 1999). The specific issue argued in the *Heavy* case was whether the deposit of motor vehicle excise tax (MVET) revenue into the state Motor Vehicle Fund (i.e., the "special fund" referenced in Amendment 18) violated the Amendment's proviso that specifically exempts MVET revenue from deposit into the Motor Vehicle Fund. The court held that the Legislature's discretionary deposit of other revenue sources into the Motor Vehicle Fund does not violate the constitutional provision; mere deposit of revenue into the Fund does not transform it into the category of revenue restricted by Amendment 18: "It is not reasonable, however, to believe that where a practice is not required it is necessarily forbidden, or that, quite paradoxically, by expressly not being limited the expenditure of MVET revenue is somehow limited [by Amendment 18]." *Heavey* at 806.

¹⁹ This is what economists refer to as the benefit-principle of taxation, dating back to Adam Smith's *Wealth of Nations*. The benefit principle holds that consumers of government services should be taxed in

commonly applied in property tax situations.²⁰ In Washington, there are several transportation-related in-lieu-of taxes in law. For example, the state’s rental vehicle sales tax was originally designed as an in-lieu-of tax to be paid by rental car companies (who in turn pass these costs down to customers), in recognition of the fact the state exempted rental car companies from otherwise paying the state motor vehicle excise tax on each car in their fleet.²¹

If RUC were enacted in lieu of gas taxes, this would mean that a certain set of vehicles would not be subject to the gas tax, and instead be required to pay RUC. In this situation, since RUC is owed in lieu of gas taxes, the argument would be that the use of the RUC revenue would be restricted in the same manner as gas taxes. One example of how this could be designed: the Legislature could exempt certain types of vehicles from owing gas taxes; say, plug-in hybrid electric vehicles (PHEVs), which use both gasoline and battery-powered electricity for propulsion. No longer subject to the gas tax, the Legislature would instead impose a RUC on these vehicles “in lieu of” the gas tax. The revenue would be deposited in the motor vehicle fund, and when accompanied with explicit legislative intent language in the RUC authorizing statute, the revenue could be restricted “exclusively for highway purposes.”

This approach does not magically convert a RUC into a motor vehicle fuel tax. However, it does create the strongest possible presumption of legislative intent that RUC revenues are the categorical type specifically anticipated in Amendment 18.

proportion to the benefit they obtain from those services. See *Encyclopedia Britannica, Taxation, The benefit principle*, www.britannica.com/topic/taxation/The-benefit-principle. Last accessed: November 18, 2018.

²⁰ See, for example: *Payments in Lieu of Taxes*, Report from the Washington State Department of Revenue, December 2013.

²¹ C.f., RCW 82.08.020(2). This in lieu of tax was intended to provide similar compensation as would be received by the state if they collected the motor vehicle excise tax (MVET) on rental vehicles. However, the state MVET was later repealed by Initiative 695 when the substantive provisions were ratified by the voters in 1998 as Referendum 49. As a result, the rental car sales tax was amended to change the depository account and remove the in lieu of designation.

2.4.2 RUC as a vehicle license fee

Perhaps the most feasible alternative, first highlighted in the analysis conducted by the Office of the State Treasurer,²² is to structure RUC as a vehicle license fee²³ that would be levied in an amount based on miles traveled. The fact that the amount of the license fee would vary based on mileage rather than imposed as a single flat rate amount (currently \$30) is not an issue. Amendment 18 makes no reference to specific amounts or how the vehicle license fee must be calculated or determined; it only requires that the fee (i) be collected by the State of Washington (ii) as a license fee (iii) for motor vehicles.²⁴

A variable-rate vehicle license fee has been in existence – and subject to Amendment 18 – in some form for decades. Vehicles over 4,000 lbs. pay a “license fee by weight” that includes a variable component based on the gross vehicle weight rating of the vehicle.²⁵ This license fee by weight applies to both passenger-type and heavier commercial vehicles. The proceeds are deposited to various accounts within the motor vehicle fund (the “special fund” referenced in Amendment 18).

There are several design alternatives for implementing this approach for RUC,²⁶ but the following is one simplified example: the Legislature could amend the current vehicle license fee so that that the amount owed is based on annual miles traveled. All vehicles would owe an initial fixed amount of \$30 (matching the current vehicle license fee amount), plus a variable amount that scales up (e.g., increments of \$25 for each 1,000 miles traveled during the year). The license fee

²² Fiscal Implications of a Potential Transition to Road Usage Charges – Preliminary Findings, Office of the Treasurer, September 25, 2014.

²³ In Washington, the terminology used in the Washington Constitution is motor vehicle license fee. The authorizing statute for this fee, RCW 46.17.350, also uses vehicle licensing fee. However, because the fee is collected at the time of vehicle registration and annual renewals, the fee is sometimes loosely referred to as a vehicle “registration” fee.

²⁴ Const. art. II, Section 40 (amend. 18) provides, in pertinent part: “All fees collected by the State of Washington as license fees for motor vehicles and all excise taxes collected by the State of Washington on the sale, distribution or use of motor vehicle fuel and all other state revenue intended to be used for highway purposes, shall be paid into the state treasury and placed in a special fund to be used exclusively for highway purposes.” The breakdown of distinct elements of this section is provided only to assist readers in focusing in on required elements of the enabling clause.

²⁵ License Fee by Weight, RCW 46.17.355.

²⁶ The variables for implementing a mileage-based vehicle license fee include how mileage is reported; whether the license fee varies in increments of 1 mile, 100 miles, 1000 miles or more; how often the vehicle license fee is owed; and many other variables that are the subject of the Steering Committee’s work.

actually owed by the vehicle owner would be offset by an amount attributable to their gas taxes already paid during the year (assuming the gas tax must remain in place during a transitional period). Additional detail revolving around this scenario can be provided if the Steering Committee expresses interest in further development.

Precise drafting will be important to make clear the revenue mechanism is being imposed as a vehicle license fee – not as an additional or new tax collected at the same time as vehicle registration.

When enacting such a system the Legislature might opt to include additional legislative language making clear their intent that the proceeds of the restructured fee be used exclusively for highway purposes, consistent with Article II, Section 40 of the Washington Constitution (i.e., Amendment 18). This should remove any doubt about its status as a vehicle license fee.

2.4.3 RUC as a categorical revenue

A third alternative is to draft and enact RUC legislation that contains all of the elements required for it to qualify as a “state revenue intended to be used for highway purposes,” subjecting it to restriction under Amendment 18. This is best accomplished by including a findings section that cites the underlying factors supporting the Legislature’s desire to transition from the gas tax to RUC, coupled with explicit legislative intent language that the revenue be used exclusively for highway purposes.²⁷ It may even be helpful to create RUC as an in-lieu-of tax, collected as a replacement for the gas tax. This approach would be similar to that of several smaller fees that are collected during the vehicle licensing process, are made subject to Amendment 18, but are not, strictly speaking, “vehicle license fees.”²⁸

²⁷ The Legislature’s first authorization for the RUC Assessment work contains several such factors, including the advent of electric and other alternative fueled vehicles, increasing federal fuel economy requirements for passenger vehicles, and the resulting expected decrease in revenue from the motor fuel tax.

²⁸ Examples of these categorical revenues that are treated as restricted by Amendment 18 are numerous: camper registration fee (RCW 46.17.350); commercial vehicle safety enforcement fee (RCW 46.17.315); Farm Exempt Decal Fee (RCW 46.16A.420); and several others. See *Transportation Resource Manual*, Joint Transportation Committee, January 2017 for complete listing.

Although the expenditure of the RUC revenue would be restricted by Amendment 18, unlike the gas tax and a vehicle license fee, these “other revenues” are not granted a specific exemption from the state’s constitutional debt limit that regulates how much debt the state can lawfully carry²⁹.

A second potential drawback with this approach is that technically, the Legislature could amend the language of the RUC enabling statute to remove it from the Amendment 18 restrictions. If there are concerns about the permanency of the dedication of RUC for highway purposes, then this approach might be viewed by some as less desirable than the RUC vehicle license fee approach described above.

²⁹ Const. art. VIII, Section 1(b).

3 OTHER METHODS OF RESTRICTING RUC TO HIGHWAY PURPOSES

3.1 Statutory dedication of revenue to special accounts

In Washington, most all taxes and fees earmarked for specific purposes lack a Washington Constitutional provisions restricting the revenue from being diverted for other purposes. In transportation alone, there are numerous taxes, fees and charges that successfully fund highway-related expenditures yet are not specifically protected under Amendment 18³⁰. Toll revenue from the Tacoma Narrows bridge isn't constitutionally protected; it is statutorily dedicated³¹. Ferry fares aren't constitutionally protected either, even though the revenues are deposited into ferry-related accounts that roll up under the motor vehicle fund³². There is a long-standing practice of restricting the expenditure of various taxes and fees by directing the deposit of revenue into the motor vehicle fund (or specific accounts established within the motor vehicle fund), which is the "special fund" referenced in Amendment 18. While the Legislature has the power to redirect these revenues by amending the state statute, no instances were found where this was done in practice. Statutorily dedicating RUC revenue to the motor vehicle fund appears to be a practical and effective option for limiting the use of the revenue for highway purposes.

3.2 Pledging revenue for the repayment of bonds

Another way that revenue can be restricted is if the revenue is subsequently pledged for the repayment of bonds. This situation occurs when the state (or a local government) issues bonds that pledge repayment from a specific revenue source. Legally, public bonds are a type of financing contract between a unit of government and bondholders who agree to lend money to government. Once the contract has been entered into, government cannot unilaterally change the underlying terms of the contract in a way that impairs the rights held by the

³⁰ See footnote 28.

³¹ RCW 47.56.165 requires all tolls collected to be placed in a specially created Tacoma Narrows Toll bridge account, which resides within the motor vehicle fund, which is the special account referenced in Amendment 18.

³² RCW 47.60.315 requires ferry fares to be deposited into the Puget Sound Ferry Operations account and the Capital Vessel Replacement account, both residing within the motor vehicle fund.

bondholders. This is the current situation with regard to outstanding gas tax bonds: the State cannot fully repeal the gas tax because there are many outstanding bonds that pledged to keep the gas tax in force in amounts sufficient to guarantee repayment to the bondholders. If the State repealed the gas tax, that action would constitute an unlawful impair on the obligation of contracts under the Constitution of the United States³³.

Although pledging revenue for the repayment of bonds can prevent subsequent actions to redirect, reduce or repeal the revenue source, this approach is not intentionally used as a means of restricting revenue expenditures and is not recommended as a technique to limit how revenues can be spent.

³³ The Constitution of the United States, art. 1, section 9, clause 1 declares that “no state shall pass any bill of attainder, ex post factor law, or law impairing the obligation of contracts.” The Washington Constitution contains a nearly identical provision.



A-9

**RUC & STATE
ISSUED BONDS**

 **WA RUC**



WA RUC

RUC and State-Issued Bonds |

Last revised: March 14, 2019

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PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee's consideration as they begin to deliberate whether or how the State of Washington could transition to a per-mile fee system as a future replacement for the state's motor fuels tax (gas tax).

The information contained in this report examines issues related to the state's issuance of bonds that pledge motor vehicle fuel tax (gas tax) revenues, and the effects on both outstanding bonds and future issuances if the State of Washington transitions from the gas tax to a new funding system that collects a road usage charge (RUC), which is a per-mile charge, in its place.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on March 14, 2019. This and all other reports will remain in draft form and are open for Committee and stakeholder comments until one week before the next Steering Committee meeting (scheduled for May 2, 2019).

For this report, all footnotes and citations appear at the bottom of the page to improve readability. A key to terms used in this report is provided at the outset.

GLOSSARY

Bonds: an instrument of indebtedness that represents a loan made by investors to a borrower (the state). Bonds are a form of borrowing.

Constitution: unless otherwise noted, this refers to the Constitution of the state of Washington.

Full faith, credit and taxing power: refers to the authority of the State of Washington to make an unconditional promise to repay debt by exercising the state’s power to raise general tax revenue as necessary to meet its financial obligation. Also known as a “full faith and credit” pledge.

Gas tax: the motor vehicle fuel tax and special fuels tax imposed as an excise tax on motor fuels in the state. In this report, “gas tax” is used in reference to motor vehicle fuel tax revenue.

GO: Shorthand for a general obligation pledge of the State of Washington to repay debt by exercising the state’s power to raise general tax revenue as necessary. A GO pledge is backed by the full faith, credit and taxing power granted to the State of Washington in the Washington constitution.

Highway-related bonds: use of the proceeds of highway-related bonds is limited to *all eligible expenditures of state gas tax revenue*, which includes construction, maintenance, operations, and administration of all public roadways (whether state or local) including the state ferry system.

Highway system: means all public roadways in Washington (whether state or local) and the state’s marine highway (ferry) system.

MVFT: Motor Vehicle Fuel Tax (commonly known as the “gas tax”). In this report, “MVFT” is used when describing bonds that are secured by a pledge this tax source.

OST: Office of the State Treasurer for the State of Washington.

Revenue bonds: bonds that are secured by and to be repaid from revenue derived from the revenues of a specific project.

RUC: road usage charge, a per-mile charge collected for every mile traveled by a vehicle that is subject to the RUC.

VLF: Vehicle License Fee. The fee paid by vehicle owners to properly register their car. The fee is collected at the time of initial registration, and annually thereafter upon registration renewal. This fee is distinct from other types of vehicle fees that are paid annually (such as passenger vehicle weight fees, or the motor vehicle excise tax (MVET), which is a tax based on the value of the vehicle).

VP GO bonds: Various Purpose General Obligation bonds mean bonds issued by the State of Washington to fund general government programs and projects. These are sometimes referred to as “General Fund” or “GF” bonds.

WSTC: Washington State Transportation Commission.

EXECUTIVE SUMMARY

Since 2012, the Washington Road Usage Charge Steering Committee has been investigating the road usage charge (RUC) as a potential replacement for the state's motor vehicle fuel tax ("gas tax"). The work includes an assessment of the financial implications of switching from the gas tax to RUC, including the effect on repaying outstanding and/or authorized but unissued state bonds that are secured by the gas tax as the primary source of repayment to bondholders.

The state constitution, legislative bond authorizations, and legally-binding covenants with bondholders each require that the gas tax remain in place in sufficient amounts to repay the principle and interest due until these bonds have been fully repaid. The state currently has over \$7 billion of MVFT backed bonds outstanding. Each series has different maturity dates for when the bonds will be fully retired. The most recently issued bonds are not schedule for retirement until 2044. As the state sells new MVFT bonds, such as those authorized by the Nickle or TPA authorizations, to finance highway-related projects, the new bond issuances will further extend the time period that the gas tax must remain in place to repay the debt in due course.

In 2014, the legislature directed the Steering Committee (with assistance from the Washington State Department of Transportation (WSDOT) and the Office of the State Treasurer (OST)) to explore how the state could replace the gas tax with RUC without violating the legal requirement that sufficient gas tax revenue be available at all times to repay the bonds.

The Steering Committee had two initial ideas for what could be done with the outstanding MVFT bonds to allow the state to repeal the gas tax. However, both of these early ideas – imposing RUC in lieu of the gas tax and using the revenue to pay outstanding MVFT bonds, or refinancing the outstanding MVFT bonds and replacing them with new bonds secured by RUC revenue – proved to be financially impractical (and potentially unlawful, depending on how these strategies would be applied).

As part of their review, OST identified two potential pathways forward that would allow the state to phase out, over time, its reliance on the gas tax and instead leverage future RUC revenue. The most promising of these options, which is reflected in the structure of

the Connecting Washington authorization, is to implement RUC as a mileage-based vehicle licensing fee (VLF). Just like the gas tax, a VLF is given special treatment under the Washington constitution: proceeds from the fee can only be spent for highway-related purposes (VLF is subject to Amendment 18), and bonds secured by and repaid from the fee are excluded from the state's constitutional debt limit, enabling highway-related projects to be financed without any potential displacement of other important state capital projects competing for funding under the debt limit.

When originally presented at a 2014 Steering Committee meeting, members were left confused about this option. They had a misimpression that the state gas tax must continue to be collected *in the same amount in perpetuity*, with no possibility that it could be phased out even in the mid-or-longer term. For this reason, the Steering Committee flagged this issue for further review as part of its future policy work plan.

Since this option was first presented in 2014, the legislature and OST have created a framework for how future highway-related debt could be issued. The Connecting Washington transportation funding package passed by the legislature in 2015 authorized the issuance of \$5.3 billion of new bonds that will be secured by a pledge of both the gas tax and VLFs. If RUC is implemented in Washington as a VLF, RUC revenue could be used for repayment of these bonds. Although these new bonds will also be secured by a pledge of the gas tax as a source of repayment, as RUC matures to become a more robust, reliable revenue source, over time the reliance on gas tax revenues can be eased. Although this is a long-term strategy (state-issued bonds are typically repaid over 25 years), this model offers a legal, orderly, and fiscally practical approach if the state wishes to transition away from the gas tax and increase reliance on mileage-based fees to fund and finance the public highway system.

A second (but much more costly) alternative originally identified by OST back in 2014 involves the issuance of bonds backed only by RUC revenue – with no other source or pledge of the state's full faith and credit. While revenue bonds have the advantage of not being subject to the state's constitutional debt limit, these bonds would have much higher borrowing costs. RUC revenue that must be spent on the higher interest and borrowing costs means less revenue available to fund operations, maintenance and to construct projects.

Additional options – including those originally suggested back in 2014 – were analyzed. These other options range from highly conceptual (using RUC as a pay-as-you-go funding mechanism and relying on special gas tax levies for future highway-related borrowing), to fiscally impractical (the accelerated retirement of existing MVFT bonds), to prohibited under law (repealing the gas tax now and paying off existing bonds with RUC). These other approaches are described but sequestered in a separate back section of this paper to help ensure they will not be confused with the most legally, fiscally and practically viable option of implementing RUC as a new mileage-based vehicle license fee that is dedicated for the operations, maintenance and upkeep of the state’s public highway network.

1 BACKGROUND AND ISSUES RAISED

1.1 Introduction

This report examines: near-term issues if the state transitions away from reliance on the gas tax to a road usage charge (RUC); and also longer-term issues related to the State’s ability to issue future highway-related bonds without the gas tax supplying the majority source of repayment for those bonds.

Two primary issues are addressed, restated as questions:

1. How can the gas tax be reduced or repealed while there are outstanding MVFT bonds that specifically pledge repayment from gas tax revenue?
2. Can a RUC be structured so that any future bond issuances backed by RUC are not constrained by the state’s constitutional debt limit, or in the alternative, what other revenue sources can support future highway construction bond issuances without creating a structure that is subject to the state’s constitutional debt limit?

1.2 Background: State issuance of bonds pledging the gas tax (MVFT bonds)

To help pay for the construction and upkeep of the highway system, for many decades the State of Washington has bonds secured by the state’s motor vehicle fuel tax (MVFT, also known as the gas tax) as a primary source of repayment¹. As an additional measure of assurance to bond buyers, the state’s full faith and credit is pledged as well². Bonds that contain a promise to be repaid from two legally distinct sources of revenue are often referred to as “double-barrel” bonds.

¹ Forthcoming bond issuances will pledge several sources of revenue as a first pledge, before pledging the state’s full faith and credit. Each of these revenues constituting the first pledge are ones that are restricted to highway expenditures under Art. II, Sec. 40 of the state constitution (also known as Amendment 18). Revenue of this type must be placed into a “special fund” (i.e., the Motor Vehicle Fund) to help ensure the revenue will only be used for highway purposes, which specifically includes repayment of bonds.

² Pledging the full faith, credit and taxing power of the state means that the State of Washington is making an unconditional guarantee to repay the bonds from its general revenue sources if necessary, in the event the primary pledged revenues (i.e., the gas tax and other Amendment 18 restricted revenues) cannot be levied in sufficient amounts to fully repay bondholders.

Because the state's MVFT bonds are (a) backed by a historically-reliable revenue source, that is (b) constitutionally restricted from being diverted for non-highway uses, and further backed by (c) an unconditional further pledge of the state's full faith and credit, the bonds are sold at some of the most favorable rates available. If any of these three key features are removed, the amount of money investors are willing to pay for the bonds will decline, translating into increased interest costs for the state. The higher the interest rates on the bonds, the more state revenue that will be consumed by debt service (repayment) instead of constructing projects.

Once bonds are purchased, bondholders retain a legal right to repayment in accordance with the terms of the bond issuance. The exact contractual language is contained in bond covenants, which are legally-enforceable promises made by the bond issuer, the State of Washington. If any of the underlying terms of this binding contract with the state are changed, the bondholders can pursue legal remedies, including obtaining a court order to block any of the State's attempted changes that would adversely affect bondholders' rights.

To date, the State of Washington has issued several different series of highway-related bonds, with approximately \$8 billion still outstanding³, with varying repayment periods. Most of these bonds are secured by gas tax revenues, either as a first pledge or as a supplemental pledge⁴. As a result, once required debt service payments are taken into consideration, a very large percentage of the state's gas tax revenue must be spent on repaying bondholders.

Issue: Can RUC replace the gas tax when bonds pledging the gas tax are still outstanding?

For purposes of conducting the basic assessment of RUC, the Steering Committee has assumed that a future RUC system will replace the state's gas tax in full. Yet, given the level of MVFT bond payments still outstanding, the key question is: how can the gas tax

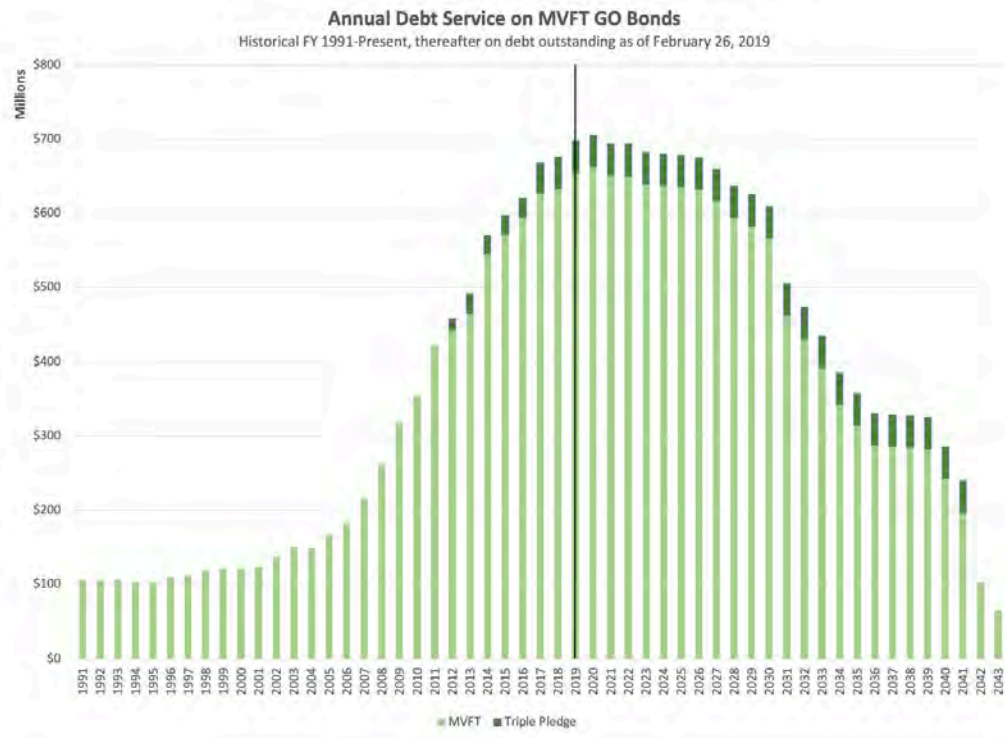
³ In addition, OST estimates an additional \$5.3 billion in Connecting Washington bonds are forthcoming.

⁴ For example, SR 520 toll bridge bonds pledges revenue from bridge tolls first, then the gas tax, and then the State's full faith and credit.

be replaced with RUC when the bond covenants specifically pledge the gas tax as a source of repayment to bond holders?

Although this threshold question must consider both legal and fiscal aspects, potential remedies can be found in the operational design -- how a future RUC system might be structured and implemented over a specific period of time. These underlying legal and fiscal questions will impact whether or how the gas tax might be eliminated -- partially, in full, or over a period of time -- in the state of Washington. As described in section 2, the Connecting Washington transportation financing structure is a promising approach.

Figure 1. Debt service obligations for bonds secured by the state gas tax, as of February 2019



1.3 Background: The State of Washington’s constitutional debt limit

Issue: can RUC revenue be pledged to repay highway-related bonds without impacting other state capital projects?

A second issue related to the ability of RUC to replace the gas tax as the predominant source of highway funding is the extent to which RUC revenues can be pledged for the

repayment of *future* highway-related bonds, much in the way Washington’s gas tax is bonded against today. There are both legal and practical considerations to this question.

Legal considerations

From a legal standpoint, there are no restrictions or prohibitions on the ability of government to pledge a road usage charge as a source of security and repayment for state-issued bonds. However, when potential RUC-backed revenue bonds are compared against typical highway-related bonds that pledge gas tax revenue for repayment, important legal differences emerge.

The Washington state Constitution⁵ places a number of limits on the issuance of state debt. For example, the Constitution limits state debt to a repayment term that is not to exceed 30 years⁶; requires a supermajority vote of the legislature to authorize the issuance of debt⁷; and contains other provisions relating to sale procedures and refinancing of the debt. In addition, the Constitution limits the aggregate maximum annual debt service on state debt that can be incurred to a six-year rolling average that cannot currently exceed 8.25% of general state revenues⁸. This section of the state Constitution also contains details about specific types of revenues and debt that are exempt from the debt limit. Among the exclusions are debt obligations payable from:

“... (1) Fees collected by the state as license fees for motor vehicles; (2) *Excise taxes collected by the state on the sale, distribution or use of motor vehicle fuel*; and (3) Interest on the permanent common school fund;”⁹.

⁵ There are statutory provisions that also regulate the state’s borrowing. RCW 39.42.070.

⁶ Const. art. VIII, Section 1(a) limits state-issued debt to 30 years. There does not appear to be any term limits on the repayment of county or municipal debt.

⁷ Const. art. VIII, Sec. 1(i).

⁸ Const. art. VIII, Section 1 (b), and RCW 39.42.070.

⁹ Const. art. VIII, Section 1 (g).

This provision effectively allows the state to issue highway-related bonds secured by a gas tax pledge, and as a secondary source of repayment, general state revenues¹⁰, without having these bonds count against the constitutional 8.25% state debt limit.

There are at least two benefits to bonds that are backed by both gas tax revenue and general state revenues. First, as “double-barrel” bonds, the bonds can be sold to investors on more favorable terms for the state, typically in the form of lower interest rates paid to bondholders. Second, because bonds that pledge the gas tax are not subject to the state’s constitutional debt limit, the state can proceed with highway-related construction programs without being constrained by the debt limit, and importantly, without displacing (or squeezing out) other important capital construction projects that must be funded within the limit.

In contrast, unless RUC is structured to qualify as one of the revenue sources not subject to the debt limit, the state’s full faith and credit cannot be added without the bonds being counted against the debt limit¹¹. Given the frequent concerns about the ability of the state to meet its capital construction and preservation needs even without including transportation-related debt, it seems unlikely that policymakers will be willing to displace other general government capital projects in order to enhance RUC bonds with a pledge of the state’s full faith and credit.

Practical considerations

Beyond the legal considerations, bonds that pledge only RUC revenues as the source of repayment could face challenges in the bond market, certainly in the near-term. First, as a new revenue source, there is no established history of revenue collection that can be examined in Washington or anywhere else in the United States to develop an investment-grade¹² revenue forecast for RUC. As is the case with other bonds that

¹⁰ To be precise, the Constitution allows the state to pledge its full faith, credit and taxing power to guarantee the repayment of any obligation payable from these three sources – vehicle license fees, motor vehicle fuel taxes, and the common school fund. As applied, this means the state would be required to supplement gas tax revenue with general state revenues if the former is insufficient to make scheduled debt payments.

¹¹ Another alternative is to amend the Washington Constitution to add RUC as a fourth type of revenue exempt from the debt limit.

¹² Most bonds sold in the market undergo an assessment by private companies (rating agencies) to assess the quality (i.e., relative risk to investors) of the proposed bonds. The three most prominent rating agencies are Moody’s, Standard and Poor, and Fitch. Collectively, these three agencies are estimated to rate 95% of all issuances.

propose new and unproven revenue sources, absent an additional pledged source of revenue (such as the state’s unconditional promise to pay from general tax revenues), credit ratings on RUC revenue bonds will be judged a riskier investment.

Second, at least in the near term, there are questions about how robust a revenue source RUC will be for borrowing purposes. If RUC fully replaces the gas tax, owners of approximately seven million vehicles will be required to report their vehicle mileage and pay RUC. The expected number of non-compliant drivers is presently unknown, and difficult to forecast until a live operational tax collection system is implemented or at least tested on a broad scale. Until RUC has been operational for several years, bonds pledging only RUC revenue will be viewed as a riskier investment when compared to other tax-exempt municipal bonds backed by more traditional revenue sources. The rating agencies can be expected to grade any proposed RUC revenue bonds according to this risk. Until RUC revenues have an established history of revenue collection – including a track record for compliance, evasion and administrative costs – they are unlikely to earn a credit rating that would be acceptable to municipal bond buyers.

The one approach that could overcome these early-year challenges to bonding against RUC revenue would be to design and implement RUC as a mileage-based vehicle license fee, as contemplated by the Connecting Washington bond authorization. A second (but much more costly) approach would be to issue stand-alone RUC revenue bonds. If structured properly, these RUC revenue bonds won’t count against the debt limit.

The following section examines these two alternatives in more detail.

2 OPTIONS FOR TRANSITIONING AWAY FROM THE GAS TAX TO RUC WHILE MEETING THE STATE'S FUTURE BORROWING NEEDS

For both legal and practical reasons, there does not appear to be any feasible way to send the current MVFT bonds into an early retirement by replacing those bonds with new RUC bonds or by making debt service payments using RUC revenue and while simultaneously eliminating the gas tax (see discussion in Appendix A for more detail). Thus, the two primary options highlighted in this section assume that all outstanding bonds that have pledged the gas tax *will be repaid according to their original terms, conditions and schedule*¹³.

Can the gas tax ever be phased out?

Important wording is contained in Art. VIII, section 1(g), as it illuminates a possible pathway forward on how the state might be able to transition, over a longer period of time, to reduce gas tax revenues (the important text is italicized and underscored below for emphasis). The state may

“...pledge its full faith, credit, and taxing power to guarantee the payment of any obligation payable from revenues received from any of the following sources: (1) Fees collected by the state as license fees for motor vehicles; (2) Excise taxes collected by the state on the sale, distribution or use of motor vehicle fuel; and (3) Interest on the permanent common school fund: *Provided, that the legislature shall, at all times, provide sufficient revenues from such sources to pay the principal and interest due on all obligations for which said source of revenue is pledged.*”

¹³ An exception would be if the OST decides to refinance eligible issuances for reasons wholly unrelated to RUC. Typically, outstanding bond issuances are refinanced only when there is a clear financial advantage to be gained by the state.

The Constitution does *not* require the state to impose the gas tax in perpetuity, nor does it require the state to impose that tax beyond what is needed to repay the bonds that are secured by the gas tax. Rather, the Constitution requires that the legislature at all times (a) provide *sufficient* revenue, (b) from “*such sources*” (i.e., from the pledged revenue source, the gas tax), (c) *to pay the principal and interest due* on the MVFT bonds.

Can RUC be bonded outside the state debt limit, similar to the gas tax?

The state Constitution lists specific types of revenue that can be leveraged outside of the constitutional debt limit. The types relevant for this report¹⁴ that are considered outside of the debt limit are: fees collected by the state as license fees for motor vehicles¹⁵; excise taxes collected by the state on the sale, distribution or use of motor vehicle fuel (i.e., the gas tax)¹⁶; and fees from the ownership or operation of any undertaking, facility, or project¹⁷.

A sustainable transportation fiscal policy model for the future could be crafted around: (a) reductions in collection of gas tax revenue as MVFT-bond debt service requirements lessen; (b) expansion of RUC collections commensurate with the eventual tapering off of gas tax collections; and (c) paying for future highway-related bonds by leveraging *multiple revenue sources* that are constitutionally dedicated to highway purposes and exempt from the constitutional debt limit. Considerations include:

- ▶ **Impact on other projects or programs:** can the revenue be bonded in a way that does not adversely impact other important public projects or programs, in light of the state’s constitutional debt limit?
- ▶ **Sufficiency:** will the revenue be legally sufficient, (that is, generating enough net revenue to ensure repayment of principle and interest in due course), but also practically sufficient – able to generate enough construction funding to fulfill legislative goals?

¹⁴ Other types of revenue that are not relevant for this inquiry are gifts, grants, aid, donations, etc. from the federal government or private sources; retirement system funds; performance bonds; proceeds from the common school fund; and proceeds from the sale of bonds themselves. See Washington Const. Art. VIII, Sec. 1(c).

¹⁵ Washington Const. Art. VIII, Sec. 1(g)(1).

¹⁶ Washington Const. Art. VIII, Sec. 1(g)(2).

¹⁷ Washington Const. Art. VIII, Sec. 1(c).

- ▶ **Cost effectiveness:** will the costs associated with leveraging the revenue be acceptable relative to the total amount of funding that would be generated?

The two most feasible approaches are described below and analyzed with these considerations in mind.

2.1 RUC implemented as a vehicle license fee (VLF)

As noted above, bonds secured by a pledge of license fees on motor vehicles (VLF) are exempt from the state’s debt limit. A road usage charge could be designed, implemented and administered in the form of a mileage-based license fee, either replacing or supplementing the current flat-rate annual license fee collected for all vehicles registered in the state. Specific design requirements to implement RUC as a VLF will be explored and discussed at either the June or September meeting if the Steering Committee finds this approach worthy of more detailed analysis. This approach was originally identified by the OST in their 2014 analysis. Other states considering per-mile fees are investigating or testing mileage-based registration fees¹⁸.

To legally qualify as a fee (rather than a more generally applied tax), it is important that RUC be designed and implemented so that the fee (or charge) is collected strictly for the upkeep, maintenance and operation of the state’s highway facilities. If the highway system in the state is more precisely defined and classified as a public “facility,” a fee imposed in an amount reasonably calibrated to pay for the ongoing cost of operating and maintaining that facility can be legally characterized as a “facility fee” or charge. Classifying (or recognizing) roadway networks as public facilities (or utilities) has been suggested by others¹⁹, and implemented at the municipal level (although city “street utility fees” were subsequently repealed due to other legal defects related to how the fees were calculated and imposed)²⁰.

¹⁸ Wisconsin was the first state to research and outline this approach in 2012. See Wisconsin Transportation Finance and Policy Commission report, *Keep Wisconsin Moving*, at pages 106-108. More recently, Missouri explored this option as part of their federal Surface Transportation System Funding Alternatives (STSFA) grant.

¹⁹ C.f., *Taxes vs. Fees: A Curious Confusion*, Hugh D. Spitzer, *Gonzaga L. Rev. Vol. 38:2*, 335.; *Rethinking California’s Highways as Public Utilities*, Robert Poole, *The Press-Enterprise*, July 28, 2018.

²⁰ In *Covell v. City of Seattle*, 127 Wn.2d 874 (1995), the Washington Supreme Court struck down the City of Seattle’s street utility fee because the fee was imposed as a de facto property tax, and as such required to be apportioned based on value. Other cities that had imposed a street utility fee in the same manner repealed their fees rather than face potential legal challenges.

If implemented as a VLF, RUC revenue (and bonds leveraged) would not count against the state debt limit. As a result, there should be no impact to other state capital projects or programs that would be competing for funding under the debt limit. Legislative bond authorizations to finance the Connecting Washington transportation projects adopt a very similar approach. Once issued, the bonds will be secured by both the gas tax and vehicle fees – both sources exempt from the state debt limit – and contain a secondary pledge of the state’s full faith and credit.

To pass the legal sufficiency test, in the early years while RUC is a relatively new and unproven source of revenue, other revenue sources that also provide the constitutional exemption – other types of vehicle fees and the gas tax – would need to be retained in sufficient amounts to ensure repayment of principle and interest on these bonds. However, over the longer-term RUC could be expanded to collect mileage-based license fees from a broader classification of vehicles. As RUC revenue increases, the reliance on the gas tax and other fees can be diminished as RUC proves capable of generating sufficient revenue to make debt service payments on these new “triple-pledged” bonds. If the legislature decides to implement RUC on only a very small classification of vehicles to start (say, for example, only certain types of plug-in electric vehicles), the revenue to be generated would be very modest, perhaps no more than \$3-\$5 million per year in the short run²¹. By itself, this amount is far too small to support (and justify) the issuance of bonds. However, if RUC is included as one of a handful of revenue sources pledged to repay bonds (similar to the Connecting Washington bond authorization), the lack of robust RUC revenue in the early years will be less of a concern. As RUC grows to apply to a larger number of vehicles, the revenue generated will grow significantly, and may eventually become the primary source of repayment for these triple-pledged bonds.

If RUC is structured and implemented as a VLF, the state’s full faith, credit and taxing power can be pledged as well, which will provide much better borrowing terms for the state than if the bonds were issued as stand-alone revenue bonds (discussed as the second alternative, in 2.2 below).

²¹ The amount of revenue collected would also be greatly affected by the per-mile rate that is set.

This basic structure that pledges multiple sources of constitutionally protected revenues, with a pledge of the state’s full faith and credit, is how OST and the legislature intend to issue bonds to fund the Connecting Washington program that calls for extensive transportation project investments.

Conclusion: *RUC can be structured and administered as a vehicle license fee, which would allow bonds secured by such revenues to remain outside of the state debt limit, as has been assumed in forthcoming issuances of Connecting Washington bonds. Since bonding with a new type of fee can present challenges in the bond market, the marketability of the bonds is greatly enhanced by pledging other Amendment 18 restricted revenue (gas tax, other vehicle license fees) as well as a pledge of the state’s full faith and credit.*

2.2 RUC revenue bonds

The second alternative that would allow RUC-pledged bonds to be issued outside of the debt limit is to impose RUC as a “fee or revenue derived from the ownership or operation of any undertaking, facility or project.” The Constitution exempts such fees or revenue from debt limit calculations²². In this scenario, RUC bonds would be considered stand-alone revenue bonds, where the sole source of repayment is from revenue generated by operation of the project or facility (here, operation of the highway system in the state).

While RUC revenue bonds could be exempt from the debt limit, in their 2014 analysis, OST pointed out some of the market challenges that face governments when issuing straight revenue bonds. In short, due to their limited revenue stream and lack of collection history, these bonds will carry higher borrowing costs²³.

Conclusion: *RUC can be structured and imposed as a facility fee, where the state highway system is defined and operated as a public facility. Bonds secured by revenues derived from these fees would not be subject to the state debt limit; however, these*

²² Art. VIII, Section 1 (c)

²³ See *Fiscal Implications of a Potential Transition to Road Usage Charges: Preliminary Analysis*, Office of the State Treasurer, September 25, 2014, at slide 12.

RUC revenue bonds will be more costly to issue and carry other requirements, such as mandatory reserve funds, that will constrain the total bond proceeds available.

3 POSSIBLE PATHWAY FORWARD

As MVFT bond issuances are eventually paid off with the gas tax, the amount of gas tax revenue required to satisfy the constitutional test that “sufficient revenue” be maintained to repay principle and interest on outstanding bonds will similarly decline (see chart on page 11 that shows MVFT debt service requirements tapering off over time). This would allow the legislature to legally reduce the gas tax rate, so long as the state does not incur any new debt obligations that would require increases or extensions of the gas tax²⁴. To backfill for the diminished gas tax revenue, RUC revenues could be proportionately increased by expanding the class of vehicles that would then pay RUC instead of the gas tax.

While this option does not offer any opportunity to reduce or eliminate the gas tax in the short term, lower gas tax collections might be legally permissible in the future, when the first tranche of MVFT bonds that pledged a five-cent gas tax increment begin to be repaid²⁵.

To ensure that RUC can grow to become a viable source of financing for future state-issued bonds, RUC could be implemented as a Vehicle License Fee, where the amount of the fee is based on miles traveled. Public highways in the state should be designated (or at least treated) as a type of public facility or utility and managed so that usage fees are reasonably calculated to cover the cost of operations, maintenance and upkeep of the system.

For the state’s more immediate borrowing needs, RUC could be pledged for the repayment of highway-related bonds, along with the gas tax and other vehicle license fees, backed with a pledge of the state’s full faith and credit, as envisioned by the Connecting Washington authorization. This will allow the state to borrow outside of the constraints of the debt limit, and at favorable interest rates, similar to the state’s existing

²⁴ In addition to the 2015 Connecting Washington bond authorization, there is \$1.6 billion in authorized but unissued Transportation Partnership Account bonds, and approximately \$200 million remaining in Nickel Package bonds.

²⁵ The “nickel package” was essentially a five-cent increase in the state gas tax, enacted in 2003. Gas tax revenue attributable to this increase was dedicated for the repayment of a specific list of transportation capital construction projects financed with a special issuance of MVFT bonds (“nickel bonds”). The largest number of “nickel package” bonds are currently scheduled for retirement in approximately 2030. In passing the five-cent increase, the legislature mandated that this 5-cent gas tax increase be repealed “when bonds for transportation 2003 projects are retired”. See RCW 82.38.030 (3).

MVFT bonds. Over time, as RUC matures and more vehicles are subject to paying RUC, the source of repayment on these new “triple pledge” bonds can be adjusted so that RUC grows into the primary source of repayment, allowing the state to transition away from reliance on the gas tax.

APPENDIX A

A.1 Options previously considered (and rejected)

A.1.1 Keep in place already-issued MVFT bonds but use RUC revenue to make debt service payments?

Theoretically, the State might be able to use RUC revenue to make scheduled debt service payments on outstanding MVFT bonds²⁶. However, since the Constitution (and the bond covenants) require that the gas tax remain in place in sufficient amounts to make these same payments, there's no important reason to attempt such a revenue swap if the gas tax must remain in place anyway. Additionally, this option is probably not viable after considering the costs, complications and exposure to law suits that might ensue.

Conclusion: *making scheduled debt service payments on outstanding MVFT bonds with RUC revenue instead of gas tax revenue is financially and procedurally impractical; and if state gas tax revenues are significantly reduced by the legislature, bondholders might still take legal action.*

A.1.2 Refinance all outstanding MVFT bonds by reissuing the debt with RUC revenue bonds?

One approach suggested by the WA RUC Steering Committee was to pay off the outstanding MVFT bonds by issuing a new bond series that instead pledges only RUC revenue. This was found unfeasible because the transaction costs and expected higher interest rates on the bonds would be prohibitively expensive for the State of Washington. Furthermore, a significant percentage of the bonds would have to be issued as taxable bonds, rather than as tax-exempt, further driving up costs and the likelihood of legal challenge from bondholders. Other insurmountable problems include

²⁶ Although early analysis leaned toward declaring this a legal impossibility, upon further review (and careful rewording of the issue) it was acknowledged that such a scheme might be possible, as a similar situation exists with respect to financing the Tacoma Narrows Bridge. However, the complications involved in such an ex post facto scheme, combined with the fact that this scheme would not result in the ability of the legislature to repeal the gas tax, makes this option impractical.

the expected low marketability of bonds where the source of repayment (RUC) is still unproven, and complications relating to the constitutional debt limit.

***Conclusion:** financially infeasible (and procedurally challenging if not legally impossible).*

A.2 Other options not analyzed in detail

A.2.1 Accelerated repayment of outstanding MVFT bonds?

Not analyzed as a separate option is early retirement of MVFT bonds – basically accelerated repayment – in order to speed up a transition to RUC. This strategy could be applied regardless whether the gas tax tapers down or whether RUC collections increase. The most significant (and obvious) constraint: this strategy assumes that “extra money” is available to spend on paying off bonds earlier than scheduled. While a gradual implementation of RUC may indeed net the state additional revenue, the amount is expected to be modest in the start-up phase, growing as either the legislature expands the classification of vehicles that would be subject to paying RUC, or alternatively, through natural attrition and replacement of the state’s vehicle fleet over time as vehicle manufacturers continue to switch powertrains and fuel sources to hybrid and plug-in electric technologies. Either way, there would not appear to be sufficient “extra money” from either RUC in the early years, or from any other obvious source, to comfortably allow the legislature to accelerate repayment for early retirement of MVFT bonds.

A.3 Other strategies for future transportation borrowing and cash management

A.3.1 Phase in RUC over time as MVFT bonds are paid off and the gas tax is phased out, but limit RUC to “pay-as-you-go” financing, relying on other sources to leverage new highway construction bonds.

This transportation funding strategy would rely on RUC as the primary source for all state highway related funding, except for periodic large capital improvement programs that require debt financing (and thus, long-term debt service payments). This represents

a bit of a transportation funding paradigm shift, as ongoing expenses of planning, operating, repairing and maintaining the state highway system would be funded from RUC on a cash (or pay-as-you-go, or “PAYGO”) basis; and state highway capital improvement programs would be funded through discreet tax or fee levies that tightly control the allowable expenditures and limit the duration of the levy.

In 2018, debt service on outstanding MVFT bonds was approximately \$680 million. However, estimated gas tax revenue collections for that same year were approximately \$1.7 billion. Even with one of the highest transportation debt portfolios in the nation, Washington’s annual debt service requirements still did not occupy the majority share of the gas tax (debt service was about 40% of 2018 gas tax revenue²⁷). The remaining 60% of gas tax revenue is allocated on a cash basis to numerous other highway-related projects and programs throughout the state – including direct distributions to city and county government for their roadway needs. If RUC is eventually capable of generating enough revenue to backfill these PAYGO projects, programs and distributions, it’s possible for the gas tax to be reduced proportionately. Using this simplistic example from 2018, RUC would need to generate about \$1.02 billion annually, while the gas tax would need to generate about \$680 million to meet the requirement for sufficient revenue to pay principle and interest due on outstanding MVFT bonds. Extending this example further, this would mean, in theory, the gas tax could be reduced to 29.6 cents per gallon instead of the current 49.4 cents. As MVFT bonds are paid off in the mid and longer term, the gas tax could continue to decline until phased out completely.

Relying on RUC as a PAYGO funding mechanism could happen gradually, over time, as the revenue source becomes more robust and predictable. In this option, since RUC is not designed to be leveraged, any concerns about its impact on the debt limit and other state capital programs disappears. Also, since there would be no near-term need to generate sufficient revenues to support bond issuances, there is no pressure to accelerate the transition to RUC in order to be able to sell new highway construction bonds. Cost effectiveness of RUC-backed bonds are also a moot issue.

²⁷ 2019 Debt Affordability Study, Office of the State Treasurer. Last accessed February 27, 2019 at <https://tre.wa.gov/wp-content/uploads/2019-Debt-Affordability-Study.pdf>

The remaining issue, then, is when debt-financed highway construction projects are necessary, what revenue source would be pledged to repay the debt, if not RUC?

A.3.2 Special gas tax levy to support major highway construction initiatives

The notion of using the state gas tax as a “new” source to support highway construction bonds takes some nuanced explanation. Historically in Washington, gas taxes have been imposed and increased to fund all sorts of highway-related projects and programs – not just to pay for large debt-financed capital construction initiatives. As the state began to experience rapid population and economic growth in the 1990’s (and continuing through 2018), the travel demand, wear and tear on the state highway and ferry system has outpaced available revenues. To help catch up on the backlog of needed highway construction projects, the state has increasingly resorted to debt financing, primarily funded with periodic increases in the state gas tax. However, even when large, debt-financed transportation investments have been made, the revenue resulting from the concurrent increases in the gas tax has generated funds in excess of what is required simply for debt service on the highway construction bonds. The revenue is sometimes used for related pre-construction activities (such as right of way acquisition), but also used to fund other pressing needs that do not necessarily require large, immediate infusions of cash that must be generated through bond sales.

In the future, if RUC evolves to become a predominant funding source for the basic operation, maintenance and preservation of the highway system (or “facility”), when major highway improvement projects are required, the projects could be grouped together and funded with a special gas tax levy that would be strictly dedicated to the delivery of those specific projects, and financed from a new series of highway construction bonds that pledge the revenues from the special gas tax levy. Meanwhile, RUC would continue to serve as a PAYGO source of funding for the majority of highway-related spending (including cash distributions to cities and counties). If this special gas tax levy was strictly limited to these purposes and set to expire upon repayment of the bonds, there may be greater public acceptance for the tax. This approach would most closely resemble how many local governments or special purpose districts fund their maintenance, operations and capital improvements: base-level taxes or fees provide ongoing funding for maintenance and operations; and a more limited-

scope capital improvement levy to fund one-time (but high cost) construction projects, with the levy expiring upon repayment of the capital bonds.

In Washington, the nearest analog in recent state transportation budgets might be the 2003 “Nickel” package, which raised the state gas tax by 5 cents; bonded that revenue to pay for a discreet list of projects that were specifically identified in the bond authorization; and required that the 5 cent gas tax increase expire once that specific bond issuance is paid off.

Conclusion: *RUC could someday evolve to provide enough funding to pay for all cash-basis highway-related projects and programs, while high-cost highway construction projects that require bond proceeds could be financed with a limited duration gas tax levy. This approach is similar to how many municipalities and special purpose districts fund their operations, maintenance and capital improvements, and may be found more acceptable to the public.*





A-10

**RUC & THE COMMERCE CLAUSE OF
THE UNITED STATES CONSTITUTION**

 **WA RUC**



RUC and The Commerce Clause and other provisions of the United States Constitution |



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PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee's consideration as they begin to deliberate whether or how the State of Washington could transition to a per-mile fee system as a future replacement for the state's motor vehicle fuel tax (gas tax).

The information contained in this report examines the issues that could be raised on whether a state-adopted road usage charge program meets the requirements of the Commerce Clause and other provisions of the United States Constitution and any potential restraints that might be imposed upon a RUC program.

Although this paper was drafted and reviewed by lawyers, the paper is not intended to provide specific legal advice to the State of Washington. If concerns remain related to any potential legal consequences of a road usage charge program, or if a road usage charge program is challenged on the grounds that it violates the Commerce Clause or any other provision of the US Constitution, the State should obtain legal advice and representation from its lawyers in the Office of the Attorney General of Washington.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on March 14, 2019.

For this report, all footnotes and citations appear at the bottom of the page to improve readability.

EXECUTIVE SUMMARY

The purpose of this report is to examine the constitutionality of various scenarios under the Commerce Clause and other provisions of the United States Constitution for enactment and operation of a road usage charge system within the state of Washington.

The restraints of the Commerce Clause. The United States Constitution grants to Congress the authority to regulate interstate commerce and this power places a dormant restraint on the ability of any state to regulate or tax interstate commerce. Nevertheless, when Congress is silent with regard to an area of commerce, the states have certain abilities to place impositions on interstate commerce, especially regarding taxation.

Amendment V of the United States Constitution requires that a person cannot be deprived of liberty without due process of law. The Supreme Court interprets this clause to, among other meanings, create a right to travel between states without excessive burden. This interpretation is closely related, although not identical, to the Court's *nexus requirement* for taxation of interstate commerce under the Commerce Clause.

Over time, the Supreme Court has developed a four-factor test for examining whether a state taxation scheme violates the dormant Commerce Clause. Under *Complete Auto Transit, Inc. v. Brady*,¹ a state's tax on interstate commerce will not violate the dormant Commerce Clause so long as the tax:

- (1) applies to an activity with a substantial *nexus* with the taxing state,
- (2) is *fairly apportioned*,
- (3) does *not discriminate* against interstate commerce, and
- (4) is *fairly related* to the services the state provides.

Nexus is established when the taxpayer avails itself of the substantial privilege of carrying on business in a state. A state tax is **fairly apportioned** when it is *internally consistent*, meaning if the tax were duplicated in other states, it would not result in multiple taxation, and *externally consistent*, meaning a state's tax does not reach beyond that portion of value that is fairly attributable to economic activity within the taxing state. A

¹ 430 U. S. 274 (1977)

state tax is ***non-discriminatory*** when it does not provide a direct commercial advantage to local business. Finally, a state tax has a ***fair relationship*** when the taxed business enjoys the opportunities or protections provided by the state.

This four-factor test has held since the Court established it, albeit with some adjustments in recent years to accommodate e-commerce changes to the economy.

Application of the Commerce Clause to RUC. This paper applies the *Complete Auto* four-factor test to nine RUC scenarios. The scenarios describe ways that design of a RUC program could affect driving across borders into Washington. The scenarios range from Washington residents paying RUC to *all* drivers paying RUC, including nonresidents, offsets of fuel tax against RUC payment, mileage reporting, tax rates and enforcement. All scenarios seem to pass the ***nexus, fair apportionment*** and ***fair relationship*** tests of the *Complete Auto* case. The possibilities for running awry of constitutional restraints comes with the application of the fourth factor: *non-discrimination*.

The analysis shows that most RUC designs do not impact rights under the United States Constitution. Certain areas of design, however, require obtaining specific legal advice or compliance with constitutional restraints protecting interstate commerce. This paper identifies four areas for a “careful watch” as a legislature and implementing agency adopts RUC policies and systems.

- 1) Separating RUC rates from fuel tax rates (in a situation where a state completely switches to a RUC system instead of a fuel tax system and the nonresident drivers continue to pay the fuel tax);
- 2) Offsetting, crediting or rebating fuel tax paid within the state exclusively to resident drivers;
- 3) Requiring nonresident drivers to use an electronic reporting method or compliance technology that places an extraordinary cost on out-of-state businesses relative to local businesses;
- 4) RUC and gas tax rates must have rational basis and declared public purpose;
- 5) Imposing a RUC enforcement regime that discriminates against nonresident drivers.

While interpretations of the dormant Commerce Clause may see change coming as the economy becomes more digitally-oriented, any alterations seem unlikely to affect the imposition of a per-mile charge in most iterations. The main factor for consideration should always be non-discrimination, a factor unlikely to undergo massive change in judicial interpretation.

Summary table:

	Scenario	Nexus	Fair Apportionment	Fair Relationship	Non-discrimination
1	Residents pay RUC on all miles; nonresidents pay fuel tax	Passes	Passes	Passes	Passes so long as RUC and effective per-mile fuel tax rates do not diverge substantially
2	Residents pay RUC based on miles driven within a state under a full replacement of the fuel tax; nonresidents pay Washington fuel tax	Passes	Passes	Passes	Passes so long as RUC and effective per-mile fuel tax rates do not diverge substantially
3	Residents pay RUC on all miles	Passes	Passes	Passes	Passes
4	Residents and nonresidents pay RUC on all Washington miles	Passes	Passes	Passes	Passes
5	Credit, offset, or rebate fuel tax paid in Washington	Passes	Passes	Passes	Passes as long as nonresidents are afforded the same opportunity as residents for credits, offsets, or rebates
6	Drivers report RUC manually	Passes	Passes	Passes	Passes
7	Drivers report RUC electronically	Passes	Passes	Passes	Passes as long as compliance technology and costs are not burdensome for nonresidents relative to residents
8	RUC rates vary based on vehicle characteristics	Passes	Passes	Passes	Passes as long as rates structures have a rational basis related to a declared public purpose

9	RUC enforcement approaches vary by driver class	Passes	Passes	Passes	Passes as long as the enforcement regime does not impose discriminatory processes on nonresident drivers
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1 BACKGROUND AND OBJECTIVES

1.1 WA RUC Steering Committee interest in the Commerce Clause of the United States Constitution

The Legislature’s intent in authorizing investigation of a per-mile road usage charge (RUC) was to study the funding mechanism as a potential future replacement for the state’s motor vehicle fuel tax (“gas tax”).² With increases in vehicle fuel economy expected to accelerate in the coming decade, a transportation funding system that is almost entirely dependent on gasoline sales will face declining revenue per mile, drawing into question whether the current gas tax system of roadway funding is financially sustainable over the mid and longer term.

Throughout its deliberations, the Washington Road Usage Charge (WA RUC) Steering Committee has identified policy issues to resolve before enacting a per-mile RUC. One of those issues is to understand the conditions, if any, under which a RUC could run afoul of the U.S. Constitution Commerce Clause. This report provides analysis of the issue for Steering Committee consideration.

1.2 Objectives

This report examines the constitutionality of various scenarios under the Commerce Clause for enactment and operation of a RUC system within the state of Washington, with the following objectives:

- ▶ Identify the restraints under the Commerce Clause and other provisions of the United States Constitution for state enactment of a RUC system in the state of Washington;
- ▶ Apply constitutional restraints to various RUC scenarios to identify general areas of concern for which system design and policy crafting can assist in avoiding potential constitutional pitfalls.

² 2012 Supplemental Transportation Budget, Chapter 86, Laws of 2012, at section 205, subsection (4),

2 THE COMMERCE CLAUSE AND A STATE'S POWER TO TAX INTERSTATE COMMERCE

2.1 Commerce Clause of the United States Constitution

Before considering the restraints of the United States Constitution on the state's power to impose and collect a road usage charge from Washington residents and businesses and also visitors to Washington, we must consider the nature of the relevant provisions of the United States Constitution, particularly the 3rd clause of section 8 (the Commerce Clause), and why it was enacted.

First, the relevant text of this provision³:

Article 1, section 8:

*The Congress shall have power to lay and collect taxes, impost and excises, to pay the debts and provide for the common defence and general welfare of the United States, but all duties, imposts and excises shall be uniform throughout the United States; ****⁴*

To borrow money on the credit of the United States;

*To **regulate commerce** with foreign nations, and among the several states, and with the Indian tribes; ****

**** To make all laws which shall be necessary and proper for carrying into execution the foregoing power, and all other powers vested by this Constitution in the government of the United States, or in any department or officer thereof.*

³ United States Constitution. Art. 1, Section 8, Clauses 1, 3, and 18, ratified July 3, 1788.

⁴ As used in this paper, three starred elipses (***) means "omitted irrelevant text."

2.2 History of the Commerce Clause

2.2.1 Congressional control of interstate commerce

In the period before the United States Constitution's effective date of March 4, 1789, the nation was fraught with individual state impositions on commerce between the states (interstate commerce), threatening the well-being, and indeed even the survival, of the national economy.⁵ The Articles of Confederation, which governed the states prior to 1789, established a weak federal government with no ability to regulate national commerce nor prevent economic disputes between states.⁶

A desire to resolve the nation's economic strife led to the Constitutional Convention of 1787 and ultimately a new national governance document, the United States Constitution.⁷ One of the fundamental rationales for creating the United States Constitution was to establish control of the nation's interstate commerce solely in the hands of the United States Congress.

Although not stated explicitly, by granting Congress the power to regulate interstate commerce, the Commerce Clause implicitly restrains the states from enacting legislation, including taxation, that unfairly burdens interstate commerce.⁸

2.3 Other relevant provisions of the United States Constitution

2.3.1 Right to Travel and the Due Process Clause

Although not explicitly identified in the United States Constitution, the Supreme Court has long held that persons in the United States have the right to travel freely across state borders.⁹ The Court has not agreed upon the precise provision of the Constitution upon which the right to travel rests. At various times, members of the Court have identified the different provisions within the 14th Amendment to the Constitution as the source of the

⁵ *The Federalist, Papers VII and XXII.*

⁶ Catherine Drinker Bowen, *Miracle at Philadelphia: The Story of the Constitutional Convention May to September 1787*, p. 5 (1966)

⁷ Page Smith, *The Shaping of America, Volume Three: A People's History of the Young Republic*, p. 50 (1980)

⁸ *Gibbons v. Ogden*, 22 U. S. 1 (1824)

⁹ *Crandall v. Nevada*, 6 Wall. 35, 48 (1868)

right to travel although the *Crandall v. Nevada* case may indicate the right to travel may earlier origins.¹⁰ Members of the Court have agreed that precise identification of the source of the right to travel does not have significance and recognized that the right to travel simply exists as a constitutional right implicit in the formation of a nation of states under the United States Constitution.¹¹

The relevant text:

Amendment XIV:

****** No state shall make or enforce any law which shall abridge the privileges or immunities¹² of citizens of the United States; no shall any state deprive any person of life, liberty, or property without due process of law; nor deny to any person within its jurisdiction the equal protection¹³ of the law.¹⁴***

The Supreme Court has identified three aspects to the right to travel: first, the right to move freely among states, second, the right to be treated as a welcome visitor rather than a hostile stranger and, third, the right for new arriving citizens to a state to be treated equally to native born citizens.¹⁵ The Supreme Court applies the right to travel most often for challenges to durational residency requirements for taking advantage of benefits to citizens of a state or to criminal offenses or indigency.¹⁶

The Due Process Clause protects the right to travel from state interference. The Supreme Court has found, “[t]he right of travel *** as a privilege of national citizenship, and as an aspect of liberty that is protected by the Due Process Clause of the Fifth and Fourteenth

¹⁰ 6 Wall. 35, 48 (1868)

¹¹ “Although there have been recurring differences in emphasis within the Court as to the source of the constitutional right of interstate travel, there is no need here to canvass those differences further. All have agreed that the right exists.” *United States v. Guest*, 383 U.S. 745, 758 (1966). The Court stated the same view in *Shapiro v. Thompson*, 394 U. S. 618 (1969); *San Antonio School District v. Rodriguez*, 411 U.S. 1 (1973); *Zobel v. Williams*, 457 U.S. 55 (1982); *Attorney General of N.Y. v. Soto-Lopez*, 476 U.S. 898 (1986)

¹² “[T]he right to move freely from State to State is a privilege and immunity of national citizenship.” *Aptheker v. Secretary of State*, 378 U. S. 500 (1964) (Justice Douglas concurring opinion)

¹³ *Shapiro v. Thompson*, 394 U. S. 618 (1969)

¹⁴ United States Constitution. Amendment XIV, adopted 1868.

¹⁵ *Saenz v. Roe*, 526 U. S. 489 (1999)

¹⁶ *Edwards v. California*, 314 U. S. 160 (1941)

Amendments. Whatever its source, a State may neither tax nor penalize a citizen for exercising his right to leave one State and enter another.”¹⁷

2.4 A state’s power to tax interstate commerce

2.4.1 The dormant Commerce Clause

The Commerce Clause grants to Congress affirmative authority to regulate the nation’s commerce. When Congress exercises that authority, the enacted legislation controls, but when Congress takes no action, the states are not free to enact their own legislation free of restraint. This is true specifically for regulation of a state asset such as the state’s highway system. “The highways are public property. Users of them, although engaged exclusively in interstate commerce, are subject to regulation by the State to ensure safety and conservation of the highways *** and may be required to contribute to their cost and upkeep. Common carriers for hire, who make the highways their place of business, may properly be charged an extra tax for such use.”¹⁸ In *Clark v. Poor*, the Supreme Court held that highway use taxes on interstate carriers did not violate the Commerce Clause if “assessed for a proper purpose and is not an objectionable amount.”

The Supreme Court has long held that the Commerce Clause has a negative implication, a dormant Commerce Clause, that imposes limitations on the States’ abilities to impact interstate commerce absent congressional action.”¹⁹ State impositions may not discriminate nor unduly burden interstate commerce. Yet, the Court weighs this limitation against public interest. State laws that “regulate evenhandedly to effectuate a legitimate local public interest ... will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits.”²⁰

The Supreme Court’s rulings on the dormant Commerce Clause have evolved over many decades and will likely continue to evolve as the Court takes heed of the dramatic changes taking place in commerce in the 21st Century. The ability to

¹⁷ *Jones v. Helms*, 452 U. S. 418, 419 (1981)

¹⁸ *Clark v. Poor*, 274 U. S. 554 (1927)

¹⁹ *Southern Pacific Co. v. Arizona ex rel. Sullivan*, 326 U. S. 761, 769 (1945)

²⁰ *Pike v. Bruce Church, Inc.*, 397 U. S. 137, 142 (1970)

purchase goods and services on-line via the Internet has substantially altered the national economy. It will be necessary for the Supreme Court to adapt the limitations on the power of the states to regulate and tax interstate commerce in-step. The Supreme Court has very recently recognized the impact of this change in the dynamics of the national economy and responded accordingly by overruling a longstanding position on the limitations of the states' power to tax interstate commerce.²¹

The Supreme Court's recognition of the need to update its interpretation of the dormant Commerce Clause for state taxation of interstate commerce makes reliance on the tests of its past rulings somewhat uncertain. Therefore, in examining the application of the dormant Commerce Clause to a new tax, such as a road usage charge for travel on state roadways, one must consider past rulings in context and perhaps predict potential areas of change.

In reading this paper, the reader should note that the Commerce Clause applies to the travel of businesses, whereas the Due Process Clause applies to the travel of individuals. This paper focuses on the impact of the Commerce Clause on RUC systems because the Commerce Clause requirements are similar, if not identical, to the Due Process Clause requirements and recent Supreme Court cases indicate the Commerce Clause may now be slightly stricter. For purposes of evaluating RUC systems, passage of the Commerce Clause requirements would also indicate passage of Due Process Clause requirements.

2.4.2 The four-factor test

Any doubt about the ability of a state to tax interstate commerce was resolved in 1959 in *Northwestern States Portland Cement Co. v. Minnesota*,²² when the Court held a state could impose a fairly apportioned, nondiscriminatory net income tax applied exclusively to interstate commerce. It was not until *Complete Auto Transit, Inc. v. Brady*²³ in 1977 that the Court established a four-factor standard for all cases since. Under *Complete Auto*, a state's tax on interstate commerce will not violate the dormant Commerce Clause so long as the tax:

²¹ *South Dakota v. Wayfair, Inc., et al.*, 585 U. S. ____ (2018)

²² 358 U. S. 450 (1959)

²³ 430 U. S. 274 (1977)

- (1) applies to an activity with a substantial nexus with the taxing state,
- (2) is fairly apportioned,
- (3) does not discriminate against interstate commerce, and
- (4) is fairly related to the services the state provides.

2.4.2.1 Nexus

Before the Supreme Court's very recent ruling in *Wayfair*, a determining factor for establishing substantial nexus with a taxing state was the physical presence rule. The Court required a physical presence such as retail outlets, personnel, sales-persons or property within the taxing state but denied the ability to tax a seller whose "only connection with customers in the state is by common carrier or the United States mail."²⁴

To protect the viability of the state sales tax as a revenue raising measure in the new on-line economy, the state of South Dakota passed into law Senate Bill 106 to specifically challenge the physical presence requirement in the nexus factor. In response, the Supreme Court rethought the nexus requirement.

Acknowledging that "[m]odern e-commerce does not align analytically with a test that relies on the sort of physical presence" defined in earlier precedent and that "[t]he Internet's prevalence and power have changed the dynamics of the national economy," the Supreme Court updated its view of the state power to tax interstate commerce and overturned the earlier rulings requiring a physical presence in the taxing state.²⁵

What is left of the nexus test without the physical presence rule? In *Wayfair*, the Court referenced a fairly recent earlier ruling on this point, "[S]uch a nexus is established when the taxpayer *** 'avails itself of the substantial privilege of carrying on business' in that jurisdiction."²⁶ The Court said in *Wayfair* that the nexus of the remote on-line seller "is clearly sufficient based on both the economic and virtual contacts respondents have with the state."²⁷ The Court also observed the large amount of business undertaken by the

²⁴ *Quill Corp. v. North Dakota ex rel. Heitkamp*, 504 U. S. 275 (1972)

²⁵ *South Dakota v. Wayfair, Inc., et al.*, 585 U. S. ____, 138 S. Ct. 2080 (2018)

²⁶ *Polar Tankers, Inc. v. City of Valdez*, 557 U. S. 1, 11 (2009)

²⁷ *South Dakota v. Wayfair, Inc., et al.*, 585 U. S. ____ (2018)

seller within the state and that the seller is a large, national company with a large virtual presence.

Since *Wayfair* does not set a bright-line standard for nexus, the court leaves to later rulings further development of the nexus standard. Will business size matter? Will the amount of sales determine nexus? Or, will mere sales of any amount be considered *substantial* enough to establish nexus? The nexus test is now in uncertain territory.

2.4.2.2 Fair apportionment

Following establishment of nexus with a state, the second factor of the *Complete Auto* test is fair apportionment of a state tax on interstate commerce. Fair apportionment seeks to remove the possibility of multiple taxation of a multi-state business for the same commerce simply because of crossing state borders and to prevent extraterritorial taxation. Presumably, every state can have no more than its fair share of the entire taxation of a business engaged in interstate commerce. While fair apportionment is preferred, the Supreme Court has excepted certain taxing schemes when fair division of the tax base “would produce insurmountable administrative or technological barriers,”²⁸ as long as interstate commerce is not disadvantaged. To determine whether a tax scheme is fairly apportioned, the Supreme Court examines whether the tax is internally and externally consistent.

“*Internal consistency* is preserved when the imposition of a tax identical to the one in question by every other state would add no burden to interstate commerce that intrastate commerce would not also bear.”²⁹ *Internal consistency* is a structural test that “hypothesizes a situation where other states have passed an identical statute.”³⁰ In *Oklahoma Tax Commission v. Jefferson Lines*, the Supreme Court upheld a sales tax on the price of a bus ticket for travel that originated in in the state but ended in another state. The Court reasoned “if every state imposed a tax on ticket sales within the state for travel originating there, no sale would be subject to more than one tax.”³¹

²⁸ *Goldberg v. Sweet*, 488 U. S. 252 (1989)

²⁹ *Oklahoma Tax Commission v. Jefferson Lines*, 514 U. S. 175 (1995)

³⁰ *Goldberg v. Sweet*, 488 U. S. 252, 261 (1989)

³¹ 514 U. S. 175 (1995)

Even if a state tax fails the internal consistency test, if all the taxed activities occur wholly within the state, the tax may satisfy the fair apportionment test. In *American Trucking Associations, Inc. v. Michigan Public Service Commission*,³² the Supreme Court upheld a flat annual fee on the operation of trucks within the state because the tax was on “local deliveries,” all beginning and ending within the state. The Court stated, “The flat fee is imposed only on intrastate transactions. It does not facially discriminate against interstate or out-of-state activities or enterprises. It applies evenhandedly to all carriers making domestic journeys and does not reflect an effort to tax activity taking place outside of the State.”

External consistency looks “to the economic justification of the state’s claim upon the value taxed, to discover whether a state’s tax reaches beyond that portion of value that is fairly attributable to economic activity within the taxing state.”³³ *External consistency* is a real world test that looks at “the practical or economic effect of a tax on [the] interstate activity.”³⁴ In *American Trucking Associations, Inc. v. Scheiner*, the Supreme Court struck down Pennsylvania’s flat tax on all trucks operating on state highways as failing the external consistency test by imposing a disproportionate burden on interstate trucks relative to intrastate trucks because interstate trucks traveled fewer miles per year in-state.³⁵ The Court, in *Jefferson Lines*, found the sales tax on the ticket price passed the external consistency test because sale of the ticket was a service that took place in the state rather than a tax on travel.

2.4.2.3 Non-discriminatory

The most enduring factor in the *Complete Auto* test is the discrimination test, having emerged in earlier cases in the 19th century.³⁶ The principle as stated by the Supreme Court in *Northwestern States Portland Cement Co. v. Minnesota* is, “No state may,

³² 545 U. S. 429 (2005)

³³ *Oklahoma Tax Commission v. Jefferson Lines*, 514 U. S. 175 (1995)

³⁴ *Goldberg v. Sweet*, 488 U. S. 252, 262 (1989)

³⁵ *American Trucking Association v. Scheiner*, 483 U. S. 266 (1987)

³⁶ *Welton v. State of Missouri*, 91 U. S. 275 (1876)

consistent with Commerce Clause, impose a tax which discriminates against interstate commerce... by providing a direct commercial advantage to local business.”³⁷

Though the Supreme Court has not adopted a precisely defined test for a discriminatory state tax scheme, the Court will consider discriminatory under the dormant Commerce Clause instances when a state imposes greater burdens on out-of-state goods or activities than on competing in-state goods or activities. Thus, the Court will find discriminatory imposition of a state excise tax on wholesale liquor sales while exempting local products.³⁸

A state can violate the discrimination factor not only by imposing burdensome taxes on interstate commerce but also by offering discriminatory, preferential incentives or subsidies—tax credits, refunds, reduced rates, other favorable treatment—to favor in-state businesses designed to encourage the growth of local commerce, as the following case examples indicate:

- Providing reduced rates for stock transfers when the sale of stock was made through an in-state broker rather than an out-of-state broker.³⁹
- Providing an income tax credit to encourage businesses to export through in-state corporations.⁴⁰
- Granting a state tax credit for ethanol fuel if the ethanol was produced in the state.⁴¹
- Imposing a tax on milk dealers for all in-state sales of milk, whether or not the milk was produced in Massachusetts and then placing all tax proceeds in a segregated fund and distributing the fund exclusively to operators of in-state dairy farms.⁴²

³⁷ 358 U. S. 450, 457 (1959)

³⁸ *Bacchus Imports, Ltd. V. Dias*, 468 U. S. 263 (1984)

³⁹ *Boston Stock Exchange v. State Tax Commission*, 429 U. S. 318 (1977)

⁴⁰ *Westinghouse Electric v. Tully*, 466 U. S. 388 (1984)

⁴¹ *New Energy Co. of Indiana v. Limbach*, 486 U. S. 269 (1988)

⁴² *West Lynn Creamery, Inc. v. Healy*, 512. S. 186 (1994)

- Not offering Maryland residents a full credit on income taxes paid to other states under a personal income tax system under which Maryland residents were taxed on their worldwide income and nonresidents on income earned in the state.⁴³

Notwithstanding, a discriminatory tax may be valid as a *complementary tax*.

- Providing a tax on the *use* of a product or service purchased from out-of-state businesses as a complement to an in-state sales tax.⁴⁴

2.4.2.4 Fair relationship

The final factor the Supreme Court set forth in *Complete Auto* is that the tax or levy must fairly relate to services the state, in turn, provides the payer. Essentially, the taxed business must enjoy the opportunities or protections provided by the state. This test does not consider the amount of the tax or the value of the services.

The fair relationship test requires that “the *measure* of the tax be reasonably related to the extent of the taxpayer's contact with the State, since it is the activities or presence of the taxpayer in the State that may properly be made to bear a just share of the state tax burden.”⁴⁵ On this basis, a Montana state severance tax on coal mined in the state but on federal property was upheld.

“Because it is measured as a percentage of the value of the coal taken, the Montana tax, a general revenue tax, is in proper proportion to appellants' activities within the State, and, therefore, to their enjoyment of the opportunities and protection which the State has afforded in connection with those activities. When a tax is assessed in proportion to a taxpayer's activities or presence in a state, the taxpayer is shouldering its fair share of supporting the state's provision of police and fire protection, the benefit of a trained workforce, and the advantages of a civilized society.”⁴⁶

⁴³ *Comptroller of the Treasury of Maryland v. Wynne*, 575 U. S. ____ (2015)

⁴⁴ *Henneford v. Silas Mason Co.*, 300 U. S. 577 (1937)

⁴⁵ *Commonwealth Edison Co. V. Montana*, 453 U. S. 609 (1981)

⁴⁶ *Commonwealth Edison Co. V. Montana*, 453 U. S. 609 (1981)

2.4.3 Relationship of the Commerce Clause and the Due Process Clause

While the Commerce Clause protects commercial activities from improper burdens to interstate travel, the Due Process clause protects persons with non-commercial purposes from improper burdens or restrictions to interstate travel. The Supreme Court has referred to the two clauses as closely related, both requiring *nexus* between the state and those it seeks to tax. “[T]he due process clause nexus analysis requires that we ask whether an individual’s connections with a State are substantial enough to legitimate the State’s exercise of power over him *** In contrast, the Commerce Clause and its nexus requirement are informed not so much by concerns about fairness for the individual *** as by structural concerns about the effects of state regulation on the national economy.”⁴⁷

The question is whether the nexus requirements of the Due Process Clause and the Commerce Clause are similar enough so that creation of a separate test is unnecessary for purposes of evaluating the constitutionality of a tax on use of a state’s road system.

While the recent *Wayfair* case may separate the relationship of the nexus tests of the Commerce Clause and Due Process Clause in some way, actual physical presence within a state should satisfy both clauses. Access to travel on and use of a neighboring state’s roadway system should be sufficient connection to the taxing state to provide the necessary link for either clause. If the tax is directly related to use of the taxing state’s roadway system, as a road usage charge system is set to measure and collect, then there should be no constitutional concern under either clause.

As for *fair apportionment*, both the Commerce Clause and the Due Process Clause seek to avoid multiple taxation and require fair apportionment to local activities, and both clauses require non-discrimination for state tax schemes.⁴⁸ Owing to recent the recent ruling in *Comptroller of the Treasury of Maryland v. Wynne*, the Commerce Clause restrictions may require greater scrutiny. A state’s tax scheme is not immune from the dormant Commerce Clause scrutiny simply because the state “has jurisdictional power under the Due Process Clause to impose the tax.”⁴⁹

⁴⁷ *Quill v. North Dakota*, 504 U. S. 298 (1992)

⁴⁸ *Northwestern States Portland Cement Co. V. Minnesota*, 358 U. S. 450 (1959)

⁴⁹ 575 U. S. ___, 135 S. Ct. 1787 (2015)

The Due Process Clause's counterpart to the *fair relationship* test of the Commerce Clause is that the item taxed must have a *rational relationship* to the state and the intrastate values of the enterprise.⁵⁰ In none of its cases "has the Court clarified the specific distinction between the 'rational relationship' requirement of the Due Process Clause and the 'fair apportionment' requirement of the Commerce Clause."⁵¹

There is no question that the requirements of the Commerce Clause and Due Process Clause are similar, if not quite identical for all applications. As late as 1993, Walter Hellerstein, the leading legal scholar on this topic, saw no distinction between the substantive requirements of the two clauses.⁵² The recent *Wynne* and *Wayfair* cases show that some distinction between the substantive requirements of the two clauses may exist, albeit perhaps narrow and case specific, but no such clarification has come forth.

Working the narrow territory between the Commerce Clause requirements and the Due Process Clause requirement may have no value for purposes of evaluating a tax on vehicle travel on roads within a state. Given that *nexus* is a simple requirement to satisfy (a person must drive a vehicle on the taxing state's roads), meeting the requirements for *fair apportionment*, *non-discrimination* and *fair relationship* under the possibly stricter Commerce Clause should satisfy the associated requirements of the Due Process Clause as well.

⁵⁰ *Container Corp. v. Franchise Tax Board*, 463 U. S. 159, 165 (1983); *Norfolk W.R. Co. v. Tax Commission*, 390 U. S. 317, 325 (1968); *Quill v. North Dakota*, 504 U. S. 298, 306 (1992)

⁵¹ *Stonebridge Lie Insurance v. Department of Revenue*, 18 OTR 423 (2006)

⁵² "Although the theoretical premises underlying the two clauses are conceptually distinct, the Court has drawn no distinction between the substantive requirements of the two clauses." Walter Hellerstein, *State Taxation of Corporate Income from Intangibles: Allied-Signal and Beyond*, 48 Tax L Rev 739, 744 (1993)

	Commerce Clause	Due Process Clause
Purpose.	Protect national economy	Fairness for the individual
Nexus.	Substantial nexus	Minimal nexus
Fair Apportionment.	Avoid multiple taxation and require fair apportionment to local activities	Avoid multiple taxation and require fair apportionment to local activities
Non-discrimination.	Non-discrimination	Nob-discrimination
Relationship.	Fair relationship to the extent of the taxpayer's contact with the State	Rational relationship to the state and the intrastate values of the enterprise

Conclusion: The Supreme Court has found requirements for the Due Process Clause similar but perhaps slightly different from the four-factor *Complete Auto* test for the Commerce Clause. Recent cases applying the Commerce Clause to state taxation of interstate enterprises have adjusted the requirements to respond to a changing economy. The extent these adjustments will apply as well to the Due Process Clause is not yet known. For purposes of evaluating the constitutionality of a road usage charge program, however, whatever distinction exists between the two clauses will have no difference. Application of the Commerce Clause requirements should satisfy the requirements of the Due Process Clause.

3 THE COMMERCE CLAUSE AS APPLIED TO A ROAD USAGE CHARGE

3.1 History of the road usage charge

3.1.1 Enactment of the fuel tax by the states

Through the power of the 10th amendment to the United States Constitution, the states retained the power of taxation.⁵³ In the early decades of the 20th century, state and local governments used this power to fund roadways to accommodate the growing shift to automobile travel. The states funded roads through property taxes, poll taxes, and a mix of other general tax revenues.

In 1919, Oregon became the first state in the nation to impose a fuel excise tax, levied at the production level but with the ability for passing the tax down through the retail chain to roadway users. The fuel excise tax is based on the consumption of fuel by motor vehicles, which in turn use roadway facilities funded by the tax; thus, the motor vehicle fuel tax is a user fee (albeit an indirect one).

Soon after Oregon enacted the first fuel tax of one cent per gallon, other states quickly followed. Within ten years, every state had enacted some form of a fuel tax. Although the tax rates were comparatively low (typically about one or two cents per gallon in the early years), the tax was an effective revenue-generator for state and local governments.

Throughout the 20th century, the fuel tax provided the primary means of funding the maintenance and modernization of the nation's roadway system. Legislatures frequently increased fuel taxes to expand the roadway system to accommodate population growth and to prevent the erosion of revenues from the effects of inflation.

In the early 21st century, another erosion factor entered the picture: the entry into the marketplace of highly fuel-efficient vehicles which operated using little or no fuel. This new erosion factor could only be allayed by fuel tax increases for a temporary period before the inequity of putting the entire burden of roadway funding needs onto only

⁵³ “The powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people.” Amendment X of the United States Constitution.

conventional vehicles would face strong resistance. To solve this erosion problem, the states would have to create a new method of funding roadways that did not rely upon the purchase of fuel.

The fuel efficiency erosion factor, in particular, undermined the user-pays nature of the fuel excise tax. The amount of fuel taxes the users paid varied widely depending upon the fuel efficiency of the vehicle. By the turning of the 21st century, operators of fuel-inefficient vehicles would pay four or five times the amount of fuel tax per mile as the operators of fuel-efficient vehicles. Indeed, operators of all-electric vehicles paid no fuel tax at all.

3.1.2 [The states' exploration of a per-mile road usage charge for road funding](#)

As highly fuel-efficient vehicles began to enter the marketplace at the beginning of the 21st century, state legislatures began to explore potential future revenue mechanisms to replace the heretofore robust fuel tax.

After more than a decade of research and pilot testing, the Oregon legislature enacted in 2013 a permanent per-mile road usage charge of 1.5 cents per mile for volunteer motorists of light vehicles that became operational in 2015. Branded OReGO, this program was mandated to provide an offset of the fuel tax paid by the operator of the participating vehicle. Only residents of Oregon are eligible to volunteer for participation in the OReGO program. Motorists not volunteering continue to pay the fuel tax. Nonresidents have no ability to volunteer for participation in OReGO and therefore continue to pay the fuel tax while driving in Oregon.

Following Oregon's enactment of an operational per-mile road usage charge, other states continued the investigation along the lines of the OReGO program but with improvements. California tested a pilot program with 5,000 participants in 2016-17. Washington did the same with 2,000 participants in 2018-19. In 2018, Colorado conducted a small demonstration as did Pennsylvania and Delaware under the sponsorship of the I-95 Corridor Coalition. Recently, Utah has undertaken implementation of the second, operational, per-mile charge program (after OReGO), scheduled to commence in January 2020.

Similar in nature, all the road usage charge pilot programs offer account-based mileage reporting, with a single per-mile charge rate and an offset for fuel tax paid. Only

Washington's pilot engaged out-of-state vehicles, collecting real-money in a financial interoperability test with OReGO and mock-billing tests with residents of Idaho and British Columbia, Canada.

Hawaii's per-mile charge program will be different than the others. Hawaii's program will involve, at least initially, manual collection of odometer readings as part of the state's manual safety inspection and no interstate travel on the islands.

3.2 The essential nature of a road usage charge

A per-mile road usage charge (RUC), whether a tax or a fee, is based on measurement of distance traveled by a vehicle. Otherwise, the road usage charge characteristics are flexible. Details are left to state legislatures or Congress.

A road usage charge may have multiple purposes, depending on the jurisdiction. A RUC may have factors that differentiate vehicles and thus, more than one rate. Although many states are experimenting with a policy that would allow credits against gas taxes already paid, RUC does not *require* an offset or credit of fuel excise taxes paid for refueling a vehicle. Collection of vehicle data for calculation of a RUC may range from wireless electronics to manual reporting. A RUC may cover only resident motorists or cover all motorists driving on a state's roads. A RUC may cover mileage only driven within state by any driver or all mileage of a resident vehicle.

Judging whether a state's road usage charge violates or passes the Commerce Clause will largely depend upon the construction of the RUC policies and systems for collection of data and the charge. Therefore, the various legal tests applied to a state tax to determine conformity with the dormant Commerce Clause must be applied to a number of scenarios.

3.3 Application of the Commerce Clause to road usage charge scenarios

3.3.1 Scenarios for analysis of the constitutionality of a road usage charge

3.3.1.1 Scenario 1 residents pay RUC based on miles driven within a state; nonresidents pay Washington fuel tax

Under scenario 1, the road usage charge has one rate applied only to miles driven by all resident vehicles within a state, with no offsets or credits for other taxes, thus RUC is

additive to the existing excise fuel tax. Since the basic RUC does not apply to nonresident vehicles and only applies to miles driven within the state, interstate commerce is not affected by this RUC design and therefore the Commerce Clause does not apply.

Conclusion: RUC scenario 1 should not violate the dormant Commerce Clause.

3.3.1.2 Scenario 2: residents pay RUC based on miles driven within a state under a full replacement of the fuel tax; nonresidents pay Washington fuel tax

Presumably, if RUC replaces the fuel tax entirely for resident drivers, the State of Washington would keep the fuel tax in place for nonresident drivers so they can contribute to the road system they drive upon, and burden, in Washington. The question is whether moving Washingtonians to a RUC obligation renders the fuel tax for nonresidents unconstitutional for violation of the Commerce Clause. Applying the four-factor test of *Complete Auto*, the fuel tax still has *nexus* because the driver pays the tax while in Washington. There is also a *fair relationship* because while in Washington, the nonresident motorists do avail themselves of the services of the state, including police and fire protection and the use of the state's highways.

Regarding *fair apportionment*, scenario 2 seems *internally consistent* because if the neighboring state were to also shift from a fuel tax to RUC, there would be no multiple taxation. The fuel tax paid by nonresident motorists should also be considered *externally consistent* as long as the revenues raised in this manner are applied to the Washington highway system as they are now.

It may be possible for the Washington legislature to render the fuel tax *discriminatory* under *Complete Auto* by raising the fuel tax rate to an exorbitant level for nonresident drivers while maintaining the RUC rate at a modest level for resident drivers.⁵⁴ Most likely, the test will measure the average per-mile amount paid by the average driver under each revenue system to compare the relative burden of the fuel tax an average

⁵⁴ While the state motor vehicle fuel tax is paid at “the rack” (distributor/importer level) and passed on to the motorist in the form of a higher fuel price and the Supreme Court may ignore the discrimination on the grounds that the motorist does not directly pay the fuel tax, it is likely the Court would look to the reality of the unfair additional burden placed on non-resident drivers by the added tax amount, even though paid indirectly, and void the additional fuel tax as violating the dormant Commerce Clause. The dormant Commerce Clause applies not only to state taxation but also to state actions. A state's action that has the effect of increasing the price of fuel only on nonresident drivers may unfairly burden them and violate both the Commerce Clause and the Due Process Clause.

driver pays per-mile against the RUC per-mile rate. If the per-mile amounts paid for the fuel tax and RUC are significantly different, there may be a violation of the Commerce Clause. If the average per-mile amount paid by drivers under each revenue system is similar, there will be no violation of the Commerce Clause.

Conclusion: RUC scenario 2 should not violate the dormant Commerce Clause, unless the average fuel tax amounts paid, on per-mile basis, by nonresident drivers are significantly higher than the RUC per-mile rate paid by resident drivers.⁵⁵

3.3.1.3 Scenario 3: basic RUC paid by residents on all miles driven

Under scenario 3, the basic road usage charge has one rate applied to all miles driven by all resident vehicles of a state with no offsets or credits for other taxes. Since the basic RUC does not apply to nonresident vehicles but applies to resident vehicles driven out-of-state, activity in another state is involved in calculating the road usage charge owed by these motorists. It is highly doubtful the Commerce Clause would apply in this scenario. The Supreme Court has declared that, “It is not a purpose of the Commerce Clause to protect state residents from their own state taxes.”⁵⁶

Conclusion: RUC scenario 3 should not violate the dormant Commerce Clause.

3.3.1.4 Scenario 4: basic RUC paid by all drivers (residents and nonresidents) in Washington

Under scenario 4, the basic road usage charge has one rate applied to miles driven within Washington state boundaries by vehicles driven by both residents and nonresidents with no offsets or credits for other taxes. This is an intriguing scenario because operators of nonresident vehicles would be obligated to pay the road usage charge and this would involve travel by persons with commercial purposes and other purposes. The Supreme Court ruling in *American Trucking Associations, Inc. v. Michigan Public Service Commission* indicates that a RUC covering only activities within Washington involves intrastate commerce, and not interstate commerce, if the activities involve only local point-to-point deliveries beginning and ending within the state.

⁵⁵ A variant to RUC scenario 2 sees a state raise fuel taxes but allow resident drivers to opt into RUC, with a rate set at revenue neutral rates with the previous fuel tax rate. In this case, the nonresident driver would pay higher fuel taxes relative to the resident drivers paying RUC. The result is the same as scenario 2; facially discriminatory under *Complete Auto*. If the state were to allow nonresident drivers to opt into RUC in lieu of paying the higher fuel taxes, presumably there would be no discrimination.

⁵⁶ *Goldberg v. Sweet*, 488 U. S. 252 (1989)

Therefore, the Commerce Clause would not apply even though nonresident trucking firms engage in the delivery activity.

When the activity involves transport of goods across state borders, the Supreme Court, as indicated in the *Scheiner* case, defines the activity as interstate commerce. The Supreme Court has long held that a state may impose reasonable charges for a vehicle's use of its highways, even for interstate commerce, and in doing so would not violate the Commerce Clause (absent another disqualifying factor).⁵⁷ Applying the four-factor test of *Complete Auto*, there is *nexus* because the miles are driven within the state and a *fair relationship* because while driving, the interstate motorists avail themselves of the services of the state, including police protection and the use of the state's highways.⁵⁸

Nor is the RUC under scenario 4 *discriminatory* because the same rate applies to all vehicles driven in the state and there is no preference provided to resident vehicles. The Supreme Court in *Scheiner* posited a "charge per mile of highway use" as *fair* to strike down as discriminatory a flat fee applied to in-state and out-of-state vehicles that resulted in a cost per mile of five times per mile for out-of-state vehicles as for local vehicles. The Court's rationale in *Scheiner* is consistent with an earlier decision in *Continental Baking Co. v. Woodring*, in which the Court declared that a tax on highway use by interstate motorists based on per-gross ton-mile does not impose an unconstitutional requirement where the tax was used to compensate the state for providing highway facilities and was not shown to be unreasonable.⁵⁹ Furthermore, the Court more recently observed in dicta that "[l]ess discriminatory alternatives are available to alleviate *** concern [about the volume of waste entering a state facility] *** not the least of which are *** **a per-mile tax** on all vehicles transporting hazardous waste." (emphasis added)⁶⁰

Regarding *fair apportionment*, the RUC in scenario 4 seems *internally consistent*. If each state were to adopt the same RUC, each state would only charge for miles driven within its boundaries and there would be no multiple taxation. This RUC structure also seems *externally consistent* in that there is economic justification for collecting a per-mile charge

⁵⁷ *Hendrick v. Maryland*, 235 U. S. 610, 622 (1915); *Clark v. Poor*, 274 U. S. 554 (1927)

⁵⁸ Nearly parallel to the Commerce Clause, the Due Process Clause "requires some link, some minimum connection, between a state and the person *** it seeks to tax," *Miller Brothers Co. v. State of Maryland*, 327 U. S. 340 (1954).

⁵⁹ 286 U. S. 352 (1932)

⁶⁰ *Chemical Waste Management, Inc. v. Hunt*, 504 U. S. 334,345 (1992)

to pay for the in-state roadways an out-of-state vehicle travels upon, as the Supreme Court found in *Interstate Busses Corp. v. Blodgett*.⁶¹ Further, the charge is properly proportioned to the value the driver gains by roadway access to the state.

The manner of data collection may change the outcome. This is the subject of scenarios 6 and 7.

Conclusion: RUC scenario 4 should not violate the dormant Commerce Clause.

3.3.1.5 Scenario 5: RUC paid by all drivers (resident and nonresidents) with a credit, offset or rebate for excise fuel tax paid in Washington

Scenario 5 is the same as scenario 4, except that in-state RUC payers receive offsets, credits or rebates of other taxes or fees, such as the fuel excise tax, to apply against the basic road usage charge. The *nexus* and *fair relationship* tests are met for the same reasons as for scenario 4. As for *fair apportionment*, the *internal consistency test* seems to be met because if every state applied the same scheme, multiple taxation would not result. The *external consistency test* also seems not an issue because the economic justification is the same as for scenario 4.

The issuance of offsets, credits and rebates for in-state motorists to the exclusion of out-of-state motorists may prove *discriminatory*. “Conjoining a tax and subsidy” may create “a program more dangerous to interstate commerce than either part alone,” *West Lynn Creamery*.⁶² If a nonresident driver purchases fuel in Washington and does not receive the same credit as Washingtonian drivers, this seems facially discriminatory to interstate commerce because nonresident drivers would pay both the Washington fuel tax and the road usage charge for miles driven in Washington and resident drivers would only pay the road usage charge for miles driven in-state.

To resolve the discrimination issue, the road usage charge could offer an offset, credit or rebate for fuel tax purchased in Washington against miles driven in Washington for any motorist. The question then becomes whether discrimination remains against nonresidents who have paid fuel tax on fuel purchased out-of-state but get no credit against the road usage charge for miles driven within Washington on the same tank of fuel. In the instance of Washington not offering value to a nonresident for payment of an

⁶¹ 276 U. S. 245 (1928)

⁶² 512 U. S. 186, 199 (1994)

out-of-state gas tax related to miles driven in Washington, the situation gives the appearance of burdensome unfairness; yet, if the motorist receives full credit for Washington's gas tax against the road usage charge for then driving miles in the neighboring state, the situation reverses itself. If in the same situation, the State of Washington only offers partial credit for payment of Washington's gas tax against the road usage charge in an amount fairly related to the charge, then the situation would not reverse itself wholly and a portion of the unfairness would remain. Whether the remaining amount that would be considered sufficiently burdensome to be considered facially discriminatory may be determined by the facts.

Conclusion: RUC scenario 5 may violate the dormant Commerce Clause if nonresident motorists are not afforded a similar opportunity to offset, credit or receive a rebate for fuel tax paid in Washington, or possibly in another state if the lost opportunity is considered burdensome.

3.3.1.6 Scenario 6: RUC with manual reporting by all drivers (resident and nonresident) in Washington in Washington

The essential question for scenario 6 is whether manual reporting in a RUC system would unfairly burden interstate commerce. It's hard to imagine such a scheme could ever be devised because the State of Washington would have no practical way to impose manual reporting on all out-of-state drivers. These nonresidents are not connected to the vehicle reregistration system because the State of Washington does not, and likely would not, because of practical limitations, impose registration on all vehicles traveling across its borders. Nevertheless, some states do require heavy vehicles traveling interstate to register for purposes of paying a weight-mile tax⁶³ and the Supreme Court has not regarded such registration requirements for out-of-state vehicles as a material burden on interstate commerce.⁶⁴ The state of Oregon requires, at minimum, manual reporting of miles traveled, declared maximum weight and configuration as part of its weight-mile tax paid by heavy vehicle operators traveling within the state.

Manual reporting alone, should not violate the *nexus* and *fair relationship* factors of *Complete Auto* because the mileage reported will be miles traveled within Washington

⁶³ The states with a weight-miles tax for heavy vehicles are Oregon, New Mexico, New York and Kentucky

⁶⁴ *Hendrick v. Maryland*, 235 U. S. 610, 622 (1915)

state. The *fair apportionment* factor should not be relevant because manual reporting does not affect the taxes paid or the tax rate. Further, manual reporting for out-of-state firms should not prove *discriminatory* relative to reporting requirements for resident firms if the reporting requirements are the same with no extra burden for firms located out-of-state. The Supreme Court has upheld a statute requiring interstate carriers to keep daily records and certify ton miles traveled monthly for purposes of assessing a tax on per-ton gross-mile.⁶⁵

Conclusion: RUC scenario 6 should not violate the dormant Commerce Clause.

3.3.1.7 Scenario 7: RUC with wireless, electronic reporting by all drivers (resident and nonresident) in Washington

The essential question for scenario 7 is whether a requirement for wireless, electronic reporting in a RUC system would unfairly burden interstate commerce. If the same technology requirements for mileage reporting are the same for all motorists, whether in-state or out-of-state, then the burden is the same but the frequency of use may be much different and therefore the relative burden (cost and administrative difficulty) to obtain the reporting technology may be higher for infrequent users of the Washington roadway system. Nevertheless, residency is not necessarily an indication of infrequent use. Infrequent use may be a tendency for nonresident motorists but some nonresident motorists may use Washington's roads as often as a resident motorist if they live near the border and work or have business in the neighbor state every day.

There is surely *nexus* and *fair relationship* under scenario 7. *Complete Auto's fair apportionment test* has so far applied to tax rates or burdens rather than tax compliance and thus does not apply. The *non-discrimination* factor may apply if the cost of compliance provides favorable treatment to local businesses in a way that unfairly burdens out-of-state businesses by placing them at a competitive disadvantage.

The central question with regard to non-discrimination under scenario 6 is whether the reporting method or other compliance method requires burdensome acquisition of expensive technology or added personnel not required of the local businesses to a degree that discourages interstate commerce. The answer for scenario 7 is largely

⁶⁵ *Continental Baking Co. v. Woodring*, 286 U. S. 352 (1932)

unknown because the reporting equipment and personnel required for a RUC system for light or heavy vehicles can vary widely. Some technologies and compliance requirements are relatively expensive or automatic which would not be especially burdensome for either local or out-of-state businesses. Other technologies or compliance requirements could be burdensome for both local and interstate businesses but more so for interstate carriers where cross-border visits are less common because the relative cost of each trip would prove much higher. If the RUC system had several options for reporting and compliance methods, this effect may be obviated by choice.

Conclusion: RUC scenario 7 may violate the dormant Commerce Clause if the electronic reporting method or compliance technology places an extraordinary cost on out-of-state business relative to local businesses.

3.3.1.8 Scenario 8: RUC paid by all drivers (resident and nonresident) in Washington with multiple rates for vehicles with differing characteristics

RUC systems may have variable rates for various vehicle types. This characteristic is often found in heavy vehicle distance charging systems that contain variable rates for factors such as distributed axle weight and configuration. In these heavy vehicle distance charging systems, some categories of vehicles have per-mile rates by weight class while others have annual flat taxes. These heavy vehicle charge systems have been challenged judicially, but the variable rates have survived if the annual flat tax applies only to intra-state business travel.⁶⁶ A state could adopt variable rates for a light vehicle RUC program to achieve public purposes beyond simply raising revenue for roadways.⁶⁷ The Supreme Court views rate variability as a legislative matter; “[t]he appropriate level or rate of taxation is essentially a matter for legislative, not judicial, resolution.”⁶⁸

Conclusion: RUC scenario 8 should not violate the dormant Commerce Clause with rate structures that have a rational basis related to a declared public purpose rather than

⁶⁶ *Clark v. Poor*, 274 U. S. 554 (1927); *Interstate Busses Corp. v. Blodgett*, 276 U. S. 245 (1928); *American Trucking Association v. Scheiner*, 483 U. S. 266 (1987)

⁶⁷ A RUC rate structure could accommodate, for example, public purposes such as managing greenhouse gas emissions, air quality control, energy use efficiency, congestion management, land use planning and fairness in paying for road capacity expansion and subsidizations for certain types of drivers such as those living in rural areas or who are less affluent.

⁶⁸ *Commonwealth Edison Co. V. Montana*, 453 U. S. 609 (1981)

simply a tax on doing business in the state, but annual flat taxes should be applied with caution.

3.3.1.9 Scenario 9: RUC with different enforcement approaches amongst driver classes

Owing to the distinct laws in the states and an inability to impose penalties on nonresident drivers without the cooperation of their home state, the enforcement mechanisms in a RUC system may vary between resident drivers and nonresident drivers. The central question for scenario 9 is whether different enforcement actions for resident and nonresident drivers will result in a burden for nonresident drivers involved in interstate commerce to such a degree that the enforcement regime for nonresident drivers discourages interstate commerce. That a state could impose a burdensome enforcement regime on nonresident drivers is unlikely. Washington state's easy access to the Department of Licensing, which has access to the state's vehicle registry and driver licensing records, makes imposition of enforcement measures against in-state drivers easy and not so easy against out-of-state drivers. Thus, as a practical matter, discrimination flows the opposite way and does not impede interstate commerce. Nevertheless, it is possible that creative enforcers could come up with a burdensome compliance procedure for nonresident motorists, even though this paper does not envision what such a procedure could encompass.

Conclusion: RUC scenario 9 should not violate the dormant Commerce Clause under a practical enforcement regime but enforcers should be cognizant of potentially imposing discriminatory processes against nonresident drivers while enthusiastically engaged in creating schemes to recover state-owed dollars from them.

3.4 Potential future changes in interpretation of the dormant Commerce Clause in state taxation schemes

3.4.1 The new digital economy affects judicial interpretation of past law

As the economy changes and technology evolves, the Supreme Court has shown willingness to adjust its interpretation of the application of the dormant Commerce Clause to state taxation schemes. The Court's decision in *South Dakota v. Wayfair, Inc.* upended a long-standing interpretation of the *nexus factor* of the four-factor *Complete Auto* examination. Which of the other three factors may be due for a make-over?

3.4.2 Is change coming for the *internal consistency test*?

Academic authors have heaped much criticism and analysis on the *internal consistency test* for examining the constitutionality of state taxation under the dormant Commerce Clause.⁶⁹ Some have declared the *internal consistency test* as dead while others call it a second order consideration while still others defend it as “the reigning standard.” As Mackenzie Catherine Scott states, “Taxation causes judges, scholars, states, and taxpayers enough confusion. Historically, the Supreme Court has done little to simplify this inherently complex area, wavering between the *Complete Auto* test and internal consistency test when analyzing state taxation under the dormant Commerce Clause.”⁷⁰

Together, these authors point out that the future of the dormant Commerce Clause is uncertain as applied to state taxation of interstate commerce. It would be wise to keep abreast of any changes, or likely changes, when analyzing and considering the constitutionality of new state taxation schemes under the dormant Commerce Clause.

69 Walter Hellerstein, Is “Internal Consistency” Foolish?: Reflection on an Emerging Commerce Clause Restraint on State Taxation, 87 Mich. L. Rev. 138 (1988); Walter Hellerstein and Dan T. Coenen, Commerce Clause Restraints on State Business Development Incentives. 81 Cornell L. Rev. 790 (1996); Bradley W. Joondeph, The Meaning of Fair Apportionment and the Prohibition on Extraterritorial State Taxation, 71 Fordham L. Rev. 149 (2002); Walter Hellerstein, Is Internal Consistency Dead?: Reflection on an Evolving Commerce Clause Restraint on State Taxation. 61 Tax L. Rev. 1 (2007); Mackenzie Catherine Scott, Inconsistency with the Internal Consistency Test, 77 Louisiana L. Rev. 947 (2017).

70 Mackenzie Catherine Scott, Inconsistency with the Internal Consistency Test, 77 Louisiana L. Rev. 947, 973 (2017).

4 CONCLUSION

Analysis of the road usage charge scenarios above indicates that most impositions should not run afoul of the dormant Commerce Clause or the Due Process Clause of the United States Constitution. Naturally, RUC systems tend to have an advantage over other state taxation schemes when the mileage charged is entirely within a state's boundaries on an asset (the road system) that provides an economic justification for the charge and all vehicle operators pay the same rates (save for distinguishing characteristics such as distributed weight). All scenarios for RUC systems and policies seem to pass the *nexus*, *fair apportionment* and *fair relationship* tests of the *Complete Auto* case. The possibility of running awry comes with the application of the fourth factor: *non-discrimination*.

This paper identifies four areas for a “careful watch” as a legislature and implementing agency adopts RUC policies and systems.

- 1) Separating RUC rates from fuel tax rates (in a situation where a state completely switches to a RUC system instead of a fuel tax system and the nonresident drivers continue to pay the fuel tax);
- 2) Offsetting, crediting or rebating fuel tax paid within the state exclusively to resident drivers;
- 3) Requiring nonresident drivers to use an electronic reporting method or compliance technology that places an extraordinary cost on out-of-state businesses relative to local businesses;
- 4) RUC and gas tax rates must have rational basis and declared public purpose;
- 5) Imposing a RUC enforcement regime that discriminates against nonresident drivers.

While interpretations of the dormant Commerce Clause may see change coming as the economy becomes more digital, any alterations seem unlikely to affect the imposition of a

per-mile charge in most iterations. The main factor for consideration should always be non-discrimination, a factor unlikely to undergo massive change in judicial interpretation.

Summary table:

Scenario	Nexus	Fair Apportionment	Fair Relationship	Non-discrimination
1 Residents pay RUC on all miles; nonresidents pay fuel tax	Passes	Passes	Passes	Passes
2 Residents pay RUC based on miles driven within a state under a full replacement of the fuel tax; nonresidents pay Washington fuel tax	Passes	Passes	Passes	Passes so long as RUC and effective per-mile fuel tax rates do not diverge substantially
3 Residents pay RUC on all miles	Passes	Passes	Passes	Passes
4 Residents and nonresidents pay RUC on all Washington miles	Passes	Passes	Passes	Passes
5 Credit, offset, or rebate fuel tax paid in Washington	Passes	Passes	Passes	Passes as long as nonresidents are afforded the same opportunity as residents for credits, offsets, or rebates
6 Drivers report RUC manually	Passes	Passes	Passes	Passes
7 Drivers report RUC electronically	Passes	Passes	Passes	Passes as long as compliance technology and costs are not burdensome for nonresidents relative to residents
8 RUC rates vary based on vehicle characteristics	Passes	Passes	Passes	Passes as long as rates structures have a rational basis related to a declared public purpose
9 RUC enforcement approaches vary by driver class	Passes	Passes	Passes	Passes as long as the enforcement regime does not impose discriminatory processes on nonresident drivers





A-11

ORGANIZATIONAL DESIGN FOR ROAD USAGE CHARGING

 **WA RUC**



Organizational Design for Road Usage Charging |

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PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee's consideration as they begin to deliberate whether or how the State of Washington could transition to a per-mile fee system as a future replacement for the state's motor vehicle fuel tax (gas tax).

The information contained in this report examines the functional needs and possible organizational arrangements for state agencies to administer a legislatively-adopted road usage charge program. Should the state decide to enact a road usage charge, there will be implications on existing state agencies, including resource requirements, new or updated functions, and new collaboration requirements. This paper examines the impacts and possibilities for structuring the agencies involved to deliver a road usage charge program effectively. The paper concludes with recommended elements to consider in road usage charge legislation that address organizational issues.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on June 27, 2019.

For this report, all footnotes and citations appear at the bottom of the page to improve readability.

1 INTRODUCTION

If the Washington legislature opts to enact a road usage charge (RUC) policy, it must, among other things, direct an agency or agencies to administer the program and collect the charge. Two high-level alternatives exist for organizing the delivery of a RUC program: (1) create a new state agency devoted entirely to RUC, or (2) deliver the necessary RUC functions within existing agencies. RUC Steering Committee-adopted principles and derived organizational design principles dictate the latter as a preferred approach for cost-effective delivery of a RUC system.

The purpose of this organizational assessment is to identify the agencies that could – based on their current roles and capabilities – support new RUC functions; determine the resources and inter-agency collaboration needed for RUC delivery; and indicate how enabling legislation can address organizational aspects of RUC.

To help provide accurate, useful inputs to this research, the Transportation Commission (WSTC) invited participation and input from partner agencies, including the Department of Transportation (WSDOT), Department of Licensing (DOL), Office of State Treasurer (OST), and Utilities and Transportation Commission (UTC). The purpose of the research was to collect input on organizational principles and RUC functional elements from agencies with experience conducting similar activities. Specifically, by identifying existing capabilities within state agencies, the Steering Committee and WSTC can explore options and make recommendations to the Legislature regarding “how” to begin the implementation of RUC in the most effective way for end users and the state while considering the views, constraints, and preferences of state agencies.

Based on review of existing agency roles and interviews with key staff, this report provides draft organizational principles and recommends assignment of functions to existing agencies. From that assignment of functions, a high level organizational structure for RUC emerges. The paper concludes with high-level recommendations for consideration in enabling RUC legislation as follows:

- ▶ Authorize the Department of Licensing to implement and operate a RUC program.

- ▶ Direct the Department of Transportation and Office of State Treasurer to provide specified technical and operational support functions for the successful integration of a RUC program into state transportation revenue collection.
- ▶ Direct the Transportation Commission to serve in a coordination and policy oversight capacity during the setup and early evolution of a RUC program.

The remaining sections of this paper cover organizational principles; RUC functional elements, including a summary of existing agency capabilities and recommended roles in a RUC system; and recommendations for the Steering Committee's consideration.

2 PROPOSED PRINCIPLES FOR RUC ORGANIZATIONAL DESIGN

The principles below are the starting point for the RUC organizational analysis. This list began as a draft put forth by the WA RUC project team and has been refined following input from partner agencies.

The organizational design for a RUC system should:

1. Consider all organizational and functional aspects needed for a RUC program, including those not covered in the WA RUC pilot;
2. Reflect the identified functional areas, specific functions, and tasks needed to carry out the program (i.e., “form follows function”);
3. Consider the privacy and data security implications of handling drivers’ road usage charge data;
4. Identify incremental resources required to successfully execute a RUC program;
5. Leverage existing agencies, systems and expertise as much as possible, to contain marginal costs and avoid enlarging bureaucracy;
6. Build from existing state agency relationships and processes in policy, revenue forecasting, revenue collection, and customer interaction to minimize impacts on existing agency workforce;
7. Build on lean principles when adding functions and processes to minimize addition of new resources and impacts on existing agency workforce;
8. Group customer-facing functions logically to minimize interdependencies between agencies and to deliver a cohesive end-user experience;
9. Indicate the essential information sharing, coordination, and interactions among or between agencies and vendors for maximum operational effectiveness and minimal disruption to the end user experience.

The above principles informed the analysis and recommendations presented in the remaining sections of this paper. Specifically, two high-level alternatives exist for organizing the delivery of a RUC program: (1) create a new state agency devoted entirely to RUC, or (2) deliver the necessary RUC functions within existing agencies. RUC Steering Committee-adopted principles, and the organizational design principles derived above, suggest the latter as the preferred approach for cost-effective delivery of a RUC

system. Therefore, a premise for the remainder of this analysis is that a RUC system be delivered within an existing agency or agencies, building RUC functions into existing roles and capabilities, both to minimize enlargement of bureaucracy and to optimize the end customer experience.

Candidate agencies with existing functions that logically lend themselves to support for collection of transportation revenue such as RUC include the Department of Transportation (WSDOT), Department of Licensing (DOL), Transportation Commission (WSTC), and Office of State Treasurer (OST).¹ Each agency was interviewed and capabilities assessed as an input to this analysis. Following a best-fit assessment in line with the above principles, this paper offers recommendations regarding assignment of functions to one or more agencies. An overall organizational structure, in turn, emerges from the assignment of functions to agencies.

¹ The Utilities and Transportation Commission (UTC) was also interviewed for this paper, primarily to assess the agency's expertise regarding rate setting and regulation. Rate setting was addressed in a separate RUC Steering Committee paper, with the responsibility assumed to remain with the Legislature. The Department of Revenue (DOR) was not interviewed for this paper; in an earlier assessment in 2013 DOR was determined not to conduct existing functions useful to a RUC system.

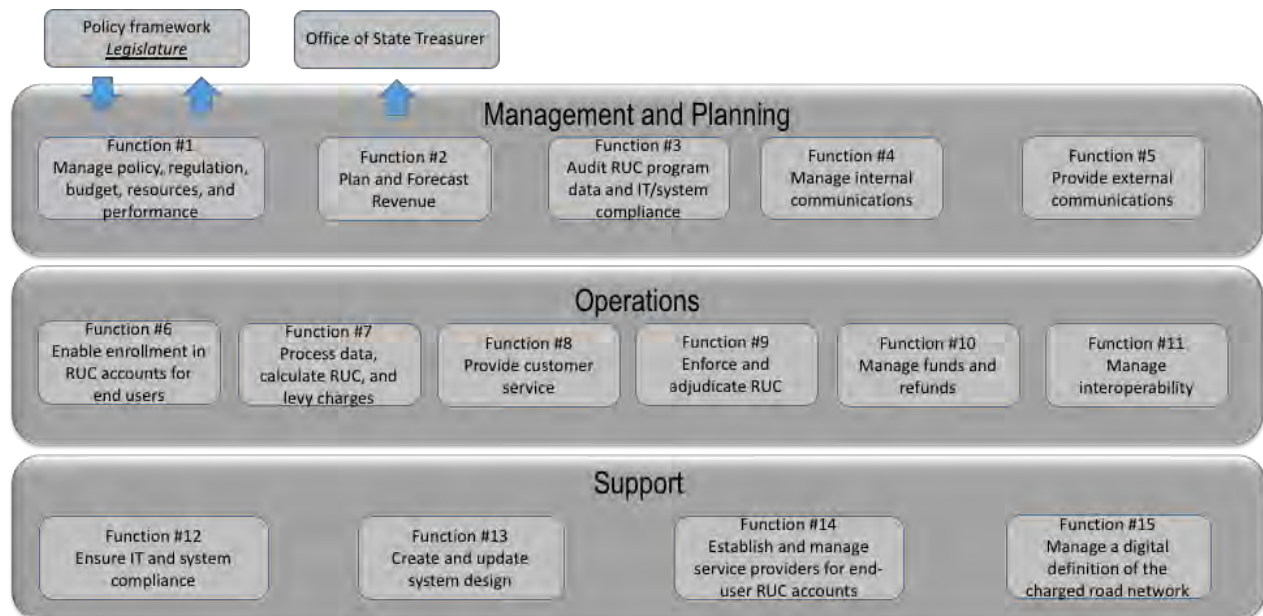
3 FUNCTIONS IN A RUC SYSTEM

The sections of this chapter summarize each of the 15 functions needed for a RUC system. Each section briefly describes each function and identifies the agencies that have the capabilities to deliver the function and highlights risks and opportunities involved, along with recommendations. Throughout these descriptions, the term “RUC Authority” refers to a hypothetical agency or agencies with the collective responsibility for carrying out RUC functions.

Each function is tied to one of three activity categories as follows:

- ▶ **Management and planning** includes functions that involve implementation and oversight of the policy established by the legislature.
- ▶ **Operations** comprises functions that directly deliver core RUC services to the end user, including enforcement and adjudication.
- ▶ **Support** includes functions that are not involved in direct delivery of RUC, but enable operations through the provision of necessary operational systems and resources.

Figure 1: Categorization of functions



While management and planning activities can be distributed across multiple agencies with minimal tradeoffs to operational efficiency and end user experience, grouping customer-facing functions (operations) within a single agency helps reduce interagency dependencies and encourages a cohesive and timely RUC service delivery. This aligns with the principle to focus on end user experience. Similarly, building strong connections between support functions and operations functions helps ensure consistent delivery of RUC services.

3.1 Manage policy, regulation, budget, resources, and performance

Description. This governance and oversight function represents the overall management of RUC. It includes responsibility for implementing policy (including awareness and responsiveness to changes in policy) established by the Legislature; writing administrative rules and standard operating procedures in collaboration with partner agencies to enable the translation of enabling law into an operational program; requesting and allocating budgets to functions within the RUC Authority; overseeing and providing support to the staff working within the RUC Authority; and monitoring and evaluating performance of the RUC program for continuous improvement. In addition, this function covers future planning and anticipating changes as the RUC program evolves organically or in response to changes in law. This function also covers work with other

agencies across government to foster a cohesive and low-impact delivery of the RUC program. This function includes overall structuring and management of staff within the RUC Authority at various levels, including unit managers as necessary.

Existing capabilities. All agencies have existing governance and oversight capabilities for their existing programs and functions. However, governance and oversight for a RUC system specifically requires specialized knowledge and familiarity with RUC statute and operational systems. In addition, WSTC is the agency with the most policy planning capability in general (and planning for evolution of a RUC program in particular), including analysis of scenarios and offering recommendations to policymakers on future direction.

Recommendations. Given the importance of governance and oversight, a low risk approach is to ensure the agency with operating responsibility for RUC also carry out this function. As discussed in later sections, DOL is the leading choice for RUC operations.

To effectively support RUC across agencies and encourage lean practices, the governance and oversight function should strive for transparency in resource allocation. This implies clear definition of roles and responsibilities between agencies and within each function; identification of processes implemented specifically for RUC; and identification of incremental resources used to deliver RUC functions. This can be accomplished through processes and standard operating procedures that are approved, shared, and implemented by agencies involved. Visibility on resources and processes will help isolate costs directly attributable to RUC, which will in turn allow a RUC cost structure to be built from the bottom up. A clearly defined cost structure can naturally inform the budget allocation decisions and allow financial performance metrics to be attached to RUC activities. It will also provide some insight into how day-to-day RUC operations can be scaled depending on evolving needs.

Performance monitoring and evaluation for continuous improvement rely on the definition of targeted outcomes, and control and performance metrics. Control metrics ensure that risks relating to operations are managed and functions comply with basic requirements – in the RUC context, control metrics would typically relate to and would be measured against data privacy, security, vendor service level requirements, and financial audit requirements. The role of performance metrics is to drive agencies to achieve the targeted outcomes – examples for RUC include end user satisfaction, user compliance,

and meeting operating budgets (with costs as a fraction of revenue collected declining over time).

As the operating agency (DOL) focuses on delivery and management of RUC, including *operational* oversight, WSTC can continue to serve in a *policy* oversight role. This includes exploration, analysis, and advice of policy opportunities, specifically, identifying opportunities for the RUC system to meet policy objectives, analysis of such opportunities, and reporting back to the Legislature. WSTC is equipped for this role as the RUC program evolves given its history and capability in RUC policy analysis and advice as well as its orientation for large-scale public outreach for policy and planning. For example, ongoing growth of the RUC program (should it evolve from a small program focused on a narrow subset of vehicles over time to a larger program impacting a large segment of the vehicle fleet) can be analyzed by WSTC as an independent, policy-focused activity.

3.2 Plan and forecast revenue

Description. The ability to forecast revenue supports a variety of core government functions, including budgeting and planning. The importance of RUC revenue forecasting increases with the state's reliance on RUC revenue.

Existing capabilities. The building blocks for forecasting activities already exist within state agencies. DOL and WSDOT currently forecast vehicle registration and licensing fees and fuel taxes. The skills and tools to forecast revenue and the mechanisms to report revenue to OST are already in place within DOL and WSDOT. In particular, revenue estimates are developed and reported to OST via the multi-agency Transportation Revenue Forecasting Council (TRFC). In addition, WSDOT forecasts statewide vehicle miles of travel (VMT) annually.

Recommendations. RUC revenue forecasting fits within existing agencies, particularly WSDOT, which devotes resources to this activity for fees that depend on VMT (namely, fuel taxes). Organizationally, little or nothing must change to address the need to plan and forecast RUC revenue; at most, for example, this function may benefit from formal inclusion of the RUC Authority as a provider of input data to and recipient of outputs from TRFC. Although the state enjoys mature vehicle and fuel-related revenue forecasting and reporting capabilities, RUC will require some enhancements, including: forecasting VMT by vehicle characteristics (should the state enact RUC for subsets of vehicles); accurate

incorporation of measured RUC revenue from prior years; and accurate observation and incorporation of leakage into revenue forecasts.

3.3 Audit RUC program data and IT/systems compliance

Description. The RUC Authority will collect large quantities of data from end users and/or service providers on a regular basis. This function covers the handling of the data. This includes:

- ▶ Monitoring incoming data to ensure compliance with system requirements.
- ▶ Analysis of data to ensure that the systems are functioning in an internally consistent manner (e.g., reconciling number of miles reported with amount of RUC reported due and amount paid).
- ▶ Answering ongoing policy and system questions such as revenue trends and compliance rates.
- ▶ Conducting audits of service providers or agency divisions responsible for data to ensure compliance with content, privacy, and security requirements.

Existing capabilities. DOL currently utilizes four positions to audit subagents and maintains a License Integrity Unit to handle investigations and fraud across the agency. Although the audit function for RUC will differ from these existing capabilities, they perform similar types of functions, particularly given subagents as an analog to RUC service providers. Given this function also serves a check on the integrity of data collected by the RUC Authority, it impacts the quality and reliability of revenue forecasts.

Recommendations. Given the existing capability within DOL, and the likelihood that RUC operations will fall within DOL, this function likewise makes sense to place with that agency. WSTC may continue to act as a consumer of data and operational reports generated by DOL (including, e.g., revenue and compliance trends) to support the fulfillment of a policy oversight role.

3.4 Manage internal communication

Description. The RUC Authority must manage internal communication among its own divisions, to outside contractors, across partner agencies, and with the Legislature. This function includes the responsibility for timing, content, and delivery of communication among all entities who play a role in RUC enactment. Internal communication includes the efficient routing of information and directives, including policy. This includes

communication from the Legislature or the agency director, to ensure they are acted upon by the appropriate division or individual, as well as communication from within the RUC Authority back to the agency director or Legislature. This two-way communication ensures policy makers receive timely feedback from operational entities for potential policy adjustments.

Internal communications also include the routing of organizational information and training. Communicating the specific distribution of roles and responsibilities within agencies will improve inter-agency coordination for minimal disruption to operations and therefore the end user. Regular training of staff to understand policy implications and to implement standard operating procedures will directly influence the extent to which RUC policies are effectively diffused within different agencies involved in RUC and relayed to external entities and end users. Internal communications will also naturally impact effectiveness of external communications addressed in the next section.

Existing capabilities. Agencies possess and rely on internal communication capabilities to operate existing programs. For RUC, the WSTC has served as the central point for all internal communication to date, coordinating input and participation by agencies including DOL, WSDOT, and OTC through a formal Steering Committee process and also through informal efforts related to the RUC research and assessment.

Recommendations. The first step in the internal communication function is to formalize the relationships among agencies with a role in RUC, which likely include DOL, WSDOT, OST, and WSTC. At least for a transitional period, WSTC could continue to serve a convening role building off the existing relationships and mechanisms deployed for the RUC assessment. In the longer term, DOL could formally lead and coordinate internal communication as it likely takes charge of most operating activities and implementation of the policy framework (rules and procedures).

3.5 Provide external communication

Description. RUC invites public scrutiny, including questions and concerns. We expect, even should a system be enacted, such questions to continue. To maintain public trust and understanding, the RUC Authority can continue to provide a venue for taking in questions about RUC and addressing them appropriately. This function could include web features with program descriptions and FAQ, telephone and email support lines, and a press liaison including occasional press releases about program activities, milestones,

or changes. Note that external communication is distinct from customer service, which directly relates to RUC operations and is covered later.

Existing capabilities. WSTC is the primary agency with experience and capability providing external communication about RUC policy and pilot operations. WSDOT and DOL have similar experience for other transportation revenue programs with substantial user interfaces (tolling and vehicle registration, respectively). DOL provides a range of external communication activities, including community outreach for new fees; special communication relationships with subagents and licensing offices for training; activation of specialized programs such as “impacted stakeholders’ program” for new initiatives. DOL does not have specialized communications delivery for outward communication and relies on the Communications and Outreach office for these services - recent examples of specialized communications include Real ID (TV and messaging to subagents) and Sound Transit RTA.

Recommendations. The agency that will support RUC operations will be well positioned to lead external communications. As discussed in the sections that cover functions related to operations, DOL is likely to bear the larger share of operational responsibilities and will be the natural point of contact for end users.

Despite the separation between RUC and tolling operations, end users may conflate the two concepts and direct questions and requests to WSDOT. We recommend WSDOT to play a coordinating role in external communication to ensure harmony of state agency responses to customers (e.g., by working across agencies to develop clear, efficient response protocols when news media or the public address questions to the wrong agency).

3.6 Enable enrollment in RUC accounts for end users

Description. Legally subjecting any vehicle to RUC requires the ability to enroll the vehicle or otherwise indicate its status as subject to RUC. This function covers all DOL vehicle registry interface tasks and activities as relates to vehicle enrollment for end users. This includes establishing and maintaining the following:

- ▶ The ability to identify eligible vehicles through vehicle registry and clear instructions to the service provider, agency division, and/or customers themselves who are responsible for enrolling end users.

- ▶ Ability to indicate and update RUC enrollment status in vehicle registry.
- ▶ Ability to share RUC enrollment status of any vehicle in real time or near-real time with end users (through one or more service providers and/or agency divisions).

Existing capabilities. No capabilities exist to enroll vehicles for a RUC program. DOL manages the vehicle registry, which can identify vehicles by a variety of characteristics, including whether they are electric vehicles (EVs) or plug-in hybrid electric vehicles (PHEVs).

Recommendations. The DOL vehicle registry is the logical platform to use for indicating enrollment status of vehicles in a RUC program. Vehicle owners can enroll either directly with DOL and/or with a private service provider, depending on the policy chosen for managing user accounts. The DOL system would need to be revised to accommodate two-way system communication (i.e., the ability to write vehicle status to the system from an input by a customer made directly with DOL via web, subagent or service provider; and the ability to read vehicle status in real time).

3.7 Process data, calculate RUC, and levy charges

Description. Outsourced RUC service providers may handle this function. In this case, the RUC Authority would be responsible for procuring service providers, providing and enforcing the RUC policy framework (including rate setting information, system requirements, and data handling policies and procedures), and overseeing them. Otherwise, the RUC Authority must build and maintain the ability to accomplish the following under this function:

- ▶ Measure mileage according to the system design requirements, using any technology consistent with the requirements and allowable under law.
- ▶ Calculate RUC charges according to requirements.
- ▶ Communicate and present amounts due to end users according to the requirements, for example through an invoice or billing statement.
- ▶ Process transactions, including collection of fees and updating of end user accounts to reflect amounts paid and new balances due.
- ▶ Process refunds including settling of fees with end users, for any number of reasons including overbilling, overpayment, or policy reasons such as credits for miles driven off road or fuel tax paid.

Existing capabilities. The WA RUC pilot demonstrated a limited capability to collect RUC charges using subagents, in which customers visited select vehicle licensing offices and used a purpose-built application on a smartphone from the subagent to capture a vehicle odometer photo. Beyond that limited demonstration, no capabilities exist to collect mileage measurements using any technology. Both WSDOT and DOL calculate charges and collect fees (for tolling and vehicle registration, respectively), including transaction processing and refunds.

For DOL, specifically, the “vehicle” is the customer, and this is an important logic that will likely apply to RUC, including the caveat that payment plans present a special challenge because of the implication that DOL could be seen to finance charges. That said, DOL enforces tolling and parking for other jurisdictions and agencies; it is conceivable an outside entity could likewise offer periodic payments to RUC customers. pre-payment of RUC would be more labor intensive than post-payment; cheapest/easiest/fastest way to implement would be self-report mileage at annual tab renewal (with some sort of ability to check or audit ideally), and this could be accomplished almost entirely in-house at low cost of collection

Recommendations. The organizational structure of mileage reporting and associated calculation and collection depends largely on the methods of mileage reporting envisioned for Washington. The most flexible approach is to invite the market to offer multiple reporting methods, as the WA RUC pilot demonstrated, then relying on DOL to serve in a procurement and oversight role, with minimal impact on existing agency operations. Perhaps the most narrow approach would be to prescribe a single mileage reporting method (e.g., self-reporting with odometer images), tied to the DOL vehicle record, with the calculation and collection of fees done by DOL similar to annual tab renewal. Regardless of the approach taken, DOL plays the critical agency role, either as overseer of private partners (similar to subagents), or as the agency conducting the function, or both.

3.8 Provide customer service

Description. Customer support is the main touchpoint for end users. The quality of services offered plays an important role in determining public acceptance. This function also gathers important feedback and data from end users, and relays this information

back to operations functions and management and planning functions for monitoring and continuous improvement based on the type and quantity of feedback received.

Customer service differs from external communication in that it refers more narrowly to support for owners or lessees of vehicles enrolled in the RUC program. Under an outsourcing scenario, most customer support will be provided by a private service provider. This includes fielding questions about enrollment and account setup, invoices and payments, technology and technical support, disputes, and general questions. Even in an outsourced scenario, the RUC Authority may provide a layer of customer support beyond the service provider to handle disputes and address general questions including policy questions that the service providers cannot or should not address.

Existing capabilities. WSDOT, like most tolling agencies, outsources customer support (e.g., call centers) because of the level of competency and efficiency that exists in the private sector for this function. WSDOT's role is to publish and enforce performance indicators, provide oversight, and serve as an escalation point.

DOL maintains an in-house call center for vehicles/drivers. All agents are in the same building and cross trained across the range of services provided by DOL. The agency tracks performance indicators internally.

Recommendations. For a consistent end user experience, the agency that supports most of the RUC operational functions should serve as the primary user interface. In this respect, DOL would be a natural candidate to play such a role. In a hybrid scenario where customer service is shared between the RUC Authority and one or more private service providers, full coordination between the customer service teams to offer a smooth end user interface is needed. This means that roles and responsibilities, and processes should be defined and agreed on between all entities supporting this function either directly or indirectly.

Customer support teams should be trained to provide general information to end users and transfer them efficiently and seamlessly to the relevant support. This function should aim to achieve a high level of consistency between customer support teams in order to avoid frustrating end users. Efficiency should also be a key objective when delivering this function especially as end users have to manage an additional administrative task.

Sources of operational efficiency include shared standard operating procedures between customer support teams, increased accessibility through an official website comprising Frequently Asked Questions (FAQs), and provision of online account management services.

Implementation of performance and control metrics helps underscore the importance of providing a seamless end user experience with minimal friction. Control metrics should be set up and monitored to ensure that customer support teams meet minimum service level requirements and respect data privacy and security policies. Performance metrics should also be set up to incentivize customer support teams to achieve high customer service satisfaction levels.

WSDOT's outsourced customer service center for tolling plays an indirect support role given the need to coordinate and redirect end users who mistakenly inquire with the tolling division about their RUC account (or vice versa).

3.9 Enforce and adjudicate RUC

Description. RUC enforcement approaches would be prescribed in some combination of enabling law and in regulation, with system design requirements specifying how they should work in greater detail. This function covers the day-to-day activities related to RUC enforcement and adjudication of offenses and disputes, which would include working with an existing or new administrative court. Enforcement functions of the RUC Authority include:

- ▶ Determining and verifying reporting infractions against law or rules, including non-payment
- ▶ Imposing fines and penalties in accordance with law and regulations
- ▶ Seeking recovery of unpaid RUC, fines, and penalties from service providers and/or end users through a collections process
- ▶ Handling appeals through an administrative process
- ▶ Identifying and reporting new and recurring infractions to the "Manage Policy and Regulation" function so that enforcement procedures can be adjusted in collaboration with partner agencies

Existing capabilities. DOL enforces charges, although no such capabilities exist for RUC.

Recommendations. As with other operational functions, DOL is the logical choice to enforce and adjudicate RUC disputes.

3.10 Manage funds and refunds

Description. Given the RUC Authority's fundamental purpose to collect funds, this function covers the actual handling of funds collected. The RUC Authority must ensure that any payments made by the service provider and/or end users are handling appropriately according to state law and deposited in the appropriate accounts in a timely and secure manner. In addition, this function covers refunds, including proper handling of payments to end users and service providers according to the enabling legislation and system requirements.

Existing capabilities. Funds collected on behalf of the state are deposited into accounts managed by OST. Although all public funds must be swept into an OST account within 24 hours of collection, OST had broad authority to issue waivers when convenient and frequently does so, including for subagents. For example, if a customer pays a subagent via credit card for a vehicle registration, the state funds are transferred from the merchant bank to the subagent's private account, then reported in a roll-up of transactions from the subagent to DOL in a periodic basis, which in turn is then provided to OST. OST then sweeps the subagent account every 3-7 days based on the DOL report. The process is largely automated, with some opportunities for manual verification.

Recommendations. Given the experience between DOL and OST, operating a similar system for handling RUC funds between the two agencies (including outside service providers, if used) should be straightforward. The largest expenditure will be to set up new accounts.

3.11 Manage interoperability

Description. This function covers the RUC Authority's interactions with other agencies within and beyond Washington related for interoperability of Washington RUC with other regulations and/or services. Depending on the enabling legislation, this function may be unperformed at the outset but could grow in time. The function includes coordination with other divisions of state and local government, the private sector, and other states to collaboratively design, implement, and operate interoperability features, similar to

Washington's participation in the International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA).

Existing capabilities. DOL manages Washington's participation in IRP and IFTA. WSTC has managed Washington's research into RUC interoperability, including collaboration with neighboring jurisdictions.

Recommendations. Although DOL possesses agency experience with transportation interoperability through IRP and IFTA, it is unclear whether this experience would translate directly to the needs and features of a RUC system with multi-state interoperability or interoperability across other types of transportation payments. Nonetheless, given DOL's importance in operating a RUC system, a key role for the agency is advisable. As with the internal communication function, WSTC can play a role to convene stakeholders and provide advisory technical and design inputs on the development of interoperability for RUC.

3.12 Ensure IT and system compliance

Description. Whatever data the state collects, whether it directly manages end-user accounts or does so through outsourced service providers, must be managed on an information technology platform owned or leased by the RUC Authority. At minimum, the state will collect periodic reports from service providers regarding aggregate miles driven, RUC due, and account status for each eligible and enrolled vehicle. Should the state undertake account management functions, it may also collect more detailed data such as miles driven by date.² This function covers the compliance of the RUC IT and systems with data security and privacy policies. IT and systems include hosting equipment or services, software programs to collect and analyze data, equipment to display data to necessary staff, the maintenance of all equipment, applications, and/or contracts for these goods and services, and the corresponding operating procedures that describe RUC data collection and handling.

It will fall on the RUC Authority to specify security and data privacy requirements, and set up mechanisms to control compliance of outsourced system and service providers with those requirements. Control mechanisms may include regular compliance audits or

² The state could theoretically collect location data, but such a policy was not tested in Washington, and driver and public reaction this approach is negative.

certifications by a state agency or through a third party. Compliance expectations are addressed upfront with vendors during contracting phases and are enforced on an ongoing basis during the lifetime of the contract. Audit and compliance activities are covered by function 3, Audit RUC Program Data and IT/systems compliance.

Existing capabilities. The agencies interviewed for this research indicated their ownership of IT and system security requirements either through in-house teams or oversight of outsourced vendors. WSTC is the only agency with experience ensuring system compliance for vendors operating a RUC system (albeit on a pilot basis).

Recommendations. Given the importance expressed by Washington drivers of protecting privacy and securing data, it is advisable that this function be shared between the operating agency (likely DOL) and, at least during a transition period while the operating agency builds the internal capabilities and systems for RUC, WSTC.

3.13 Create and update system design

Description. Enactment of RUC may specify high-level policy requirements, but will not be sufficient for detailed design and execution of a RUC system. This responsibility will fall to the RUC Authority. The function of system design includes creation of system design documents including specifications, requirements and, interfaces. The RUC Authority may take on this function itself or outsource it. Regardless, the RUC Authority should own the design, including proper maintenance of all design documentation, and providing periodic updates to them, both to be consistent with best practices and to respond to policy changes such as updated legislative or agency directives.

Existing capabilities. WSDOT has experience with this function as applied to the state's tolling system. By contrast, DOL has less deep experience in system design as it relies largely on purchasing commercial-off-the-shelf systems. WSTC has the deepest experience with RUC system design given the need to develop sophisticated design documents for the RUC pilot.

Recommendations. Given WSTC's role in designing the RUC pilot systems and DOL's likely role in operating a live system, the two agencies should collaborate in the specification of RUC system design documents. This collaboration should include: knowledge transfer from WSTC to the appropriate staff at DOL (building on existing collaboration points used for the pilot); co-development of RUC system design

documents starting from the pilot documents as a baseline; and consultation with WSTC regarding execution.

3.14 Establish and manage service providers for end-user RUC accounts

Description. The WA RUC pilot tested the concept of using outsourced service providers to deliver the functions and services to end users for collection of RUC. The services provided correspond with functions 6, 7, and 8 of this paper. Depending on the authorizing legislation, the RUC Authority may or may not be required to utilize outside service providers; if not, the functions of a service provider would need to be developed and delivered internally. This function covers the activities only in the event of outsourcing. They include:

- ▶ Procurement of one or more outside service provider consistent with statute, system design (see item 13), and any state procurement guidelines.
- ▶ Ongoing management of the outside service provider(s) contract(s), including measuring milestones and progress, monitoring service level agreements, invoicing, handling change orders, and dealing with contract renewals or re-bids.
- ▶ Ongoing evaluation of the contracts, including performance monitoring (consistent with item 1) to ensure contract terms are being met.

Existing capabilities. DOL is well versed with the approach of relying on outside service providers for customer-facing functions. Statewide, 181 subagencies provide core customer service, fee assessment, fee collection and remittance, and licensing functions on behalf of DOL. Any additional 39 county auditors provide similar services.

Conceptually, the difference between a subagent model for vehicle transactions and an outsourced service provider model for RUC transactions is modest, with the particulars of the technology and transactions forming the primary points of distinction. That said, DOL is uncertain regarding its procurement authority for a fully open system with freedom for qualified RUC service providers to enter the market.

Recommendations. Should the Legislature pursue RUC with any form of technology-based reporting as an option, it is advisable to provide legislative authority to the operating agency (DOL) to procure service providers, including ideally through an open market procurement. An open market procurement allows the agency to certify any qualified service provider who can prove they meet the specifications to collect RUC to

offer accounts to vehicle owners in the state at market rates. This approach gives the agency flexibility on procurement methodology.

3.15 Manage a digital definition of the charged road network

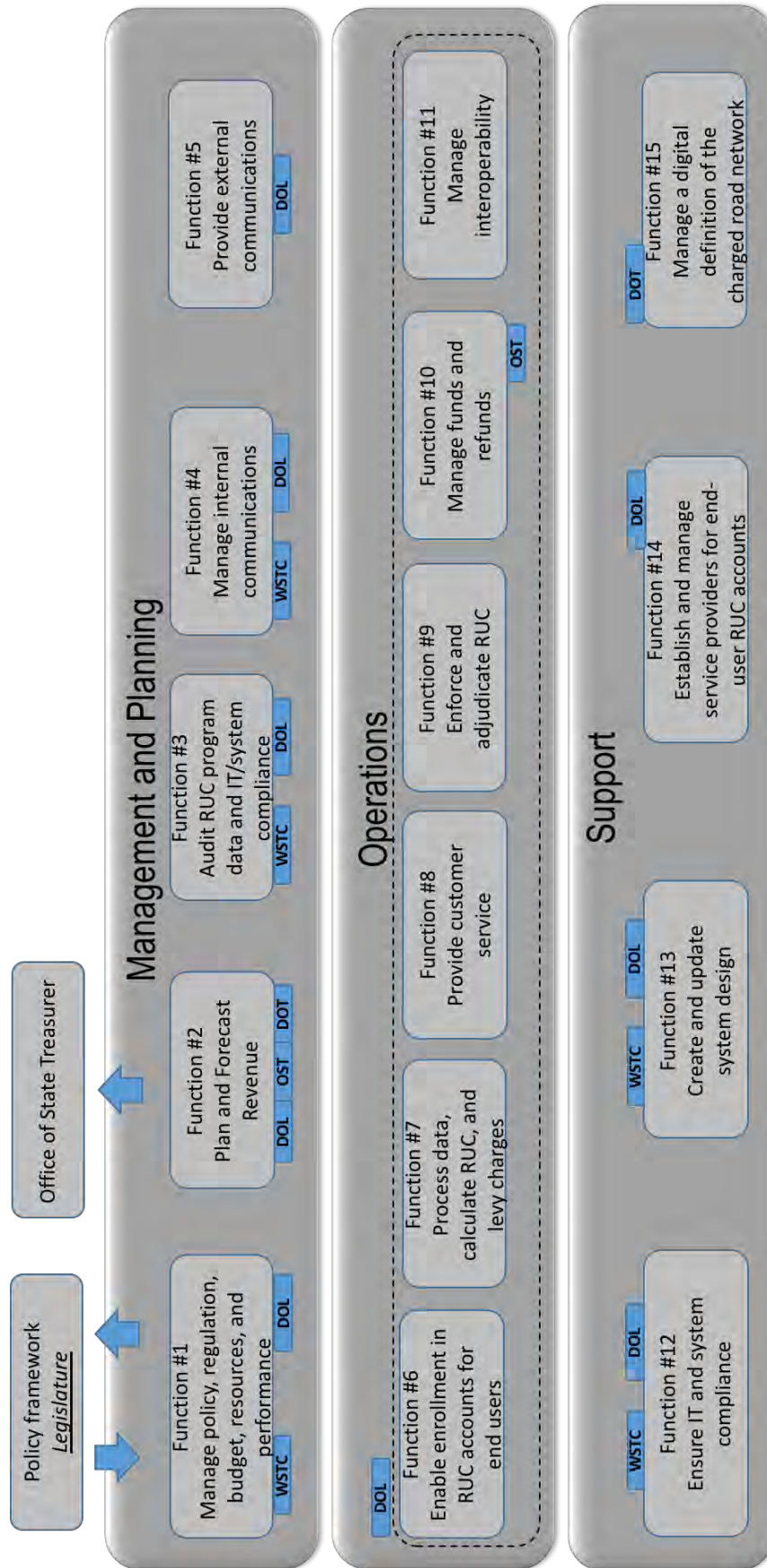
Description. Should the state apply RUC only to driving on public roads, then it must be able to define what constitutes a public road. This means the state must either provide or certify a digital definition of the state's road network, including whatever characteristics are necessary to carry out the authorizing RUC legislation. For example, the state must certify the digital maps used by service providers that the map service defines public roads to the state's satisfaction. Although digital maps themselves change constantly as data are added to enrich their coverage, this function may require only periodic updates.

Existing capabilities. WSDOT currently maintains a digital map of the public road network of the state.

Recommendations. The Legislature should direct DOL and WSDOT to collaborate on the definition of the state public road network for purposes of RUC (if off-network driving is considered exempt from RUC), including sharing of digital assets for purposes of certifying service provider maps.

3.16 Summary

The overall organization of the RUC functions is presented below with the nominated agency or agencies for each function indicated.

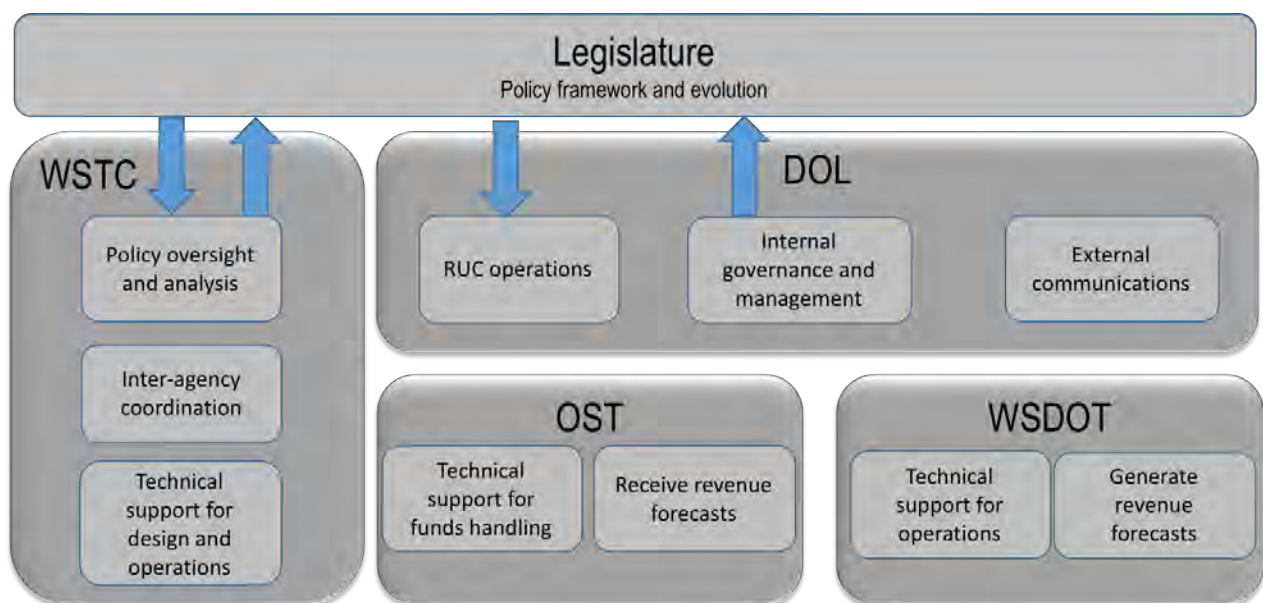


4 ORGANIZATIONAL STRUCTURE

Given the assignment of functions to existing agencies contemplated by Section 3, this section presents an overarching emergent organizational structure for consideration.

The overall role of each of the four key agencies is summarized as follows:

- ▶ DOL serves as the agency responsible for implementing and operating RUC, with authority and funding to design, procure, and build the necessary systems; oversee operations; manage the RUC program against policy requirements; and collect and deposit funds in the Treasury.
- ▶ DOT provides technical support to DOL for specialized functions including digital mapping, revenue forecasting, and tolling and interstate interoperability.
- ▶ OST provides the necessary technical support to facilitate deposit of funds into the Treasury by DOL or third party agents in the appropriate manner and also receives revenue forecasts related to RUC.
- ▶ WSTC provides a policy oversight and coordination layer as RUC evolves from a nascent program to a mature system. In addition to serving as a coordinating entity to facilitate effective delivery in line with policy expectations, the agency offers technical expertise and knowledge transfer of RUC system design and operations. It also offers policy recommendations to the Legislature based on analysis of existing operations relative to opportunities for RUC program expansion or change.



5 RECOMMENDATIONS

This report offers principles for organizational design, reviews the functions necessary to implement a RUC system, makes recommendations on how best to carry out each function for Washington, and offers an emergent organizational structure for consideration.

The organizational design principles reflect legislative guidance and Steering Committee preferences expressed about RUC over the past seven years. These include minimizing cost and bureaucracy by building on existing features, emphasizing points of coordination across agencies, considering the need to protect privacy and secure user data, and optimizing end user experiences.

From those principles, we offer organizational design recommendations for RUC in Washington as follows:

- ▶ Enabling legislation should authorize an agency to implement and operate RUC. Operations functions should be provided by the same agency and/or service provider to the extent feasible to optimize the end user experience, consistent with the principles of organizational design. The most likely candidate for implementing and operating a RUC system in Washington is the Department of Licensing.
- ▶ There are several key points of coordination between the operating agency and other agencies that enabling legislation should anticipate and recognize by authorizing or directing other agencies to serve in support roles as follows:
 - > OST should build on existing systems and collaborative partnerships with DOL handling RUC funds and forecasting RUC revenue.
 - > WSDOT should work within the TRFC construct to ensure the RUC program supports and is supported by accurate VMT and revenue forecasting; moreover WSDOT should provide technical support as appropriate such as digital mapping, collaboration with tolling operations, and insights regarding interstate interoperability.
 - > WSTC should serve in a coordinating role for the other agencies during at least a transitional period by facilitating RUC (e.g., through the RUC Steering Committee or a similar, successor entity more operationally focused), including to transfer knowledge of RUC systems to DOL. In

addition, in its policy oversight role, WSTC can analyze policy choices and make recommendations to the Legislature relating to the evolution of the RUC program.

APPENDIX: INTERVIEW GUIDE USED WITH PARTNER AGENCIES

In the interview, we will ask about your views and experiences on a range of the functions that could be required for a RUC system

Following introductions, we will ask you to lead an open-ended discussion about and description of your organization, its responsibilities, functions, staffing, organizational charts, and interfaces with other agencies and outside entities.

In the second part of the interview, we will walk through the draft principles and ask your feedback on each one.

Next, we will review the functions for a RUC system and ask your feedback on each one, focusing our discussion on those functions those most relevant to your organization.

Below are example questions to think about that we may discuss related to each function:

- ▶ How is this this function or category currently handled within your division, if at all?
- ▶ If this function or category is outsourced, how is oversight handled?
- ▶ How many FTEs are or would be required to handle this function, and how does that requirement scale with program size?
- ▶ Aside from staff, what costs are associated with this function?
- ▶ What is your assessment of your division's fitness to perform these functions for a RUC?
- ▶ What competency gaps would need to be filled to provide greater comfort or assurance in your agency's ability to handle the function?
- ▶ What statutory prescriptions related to this function would be helpful to your agency?
- ▶ What partner agencies would you work with in delivering this function, and how?
- ▶ What partner agencies would you recommend exploring to lead this function?

Finally, some general questions:

- ▶ What RUC functions are missing?

- ▶ Are any of the RUC functions identified unnecessary or overly elaborate?
- ▶ Are any of the RUC functions unnecessarily overlapping or duplicative of other RUC functions or other existing functions within your agency?
- ▶ Do you believe RUC functions should be consolidated into a standalone RUC entity, or should they be distributed across existing functions of one or more agencies? What policy or program information would influence your answer?





A-12

DEPARTMENT OF LICENSING IT
SYSTEM CAPABILITIES & NEEDS

 **WA RUC**



Department of Licensing IT System Capabilities and Needs



PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee's consideration as it deliberates on the prospects for the State of Washington to transition to a per-mile fee system as a future replacement for the state's motor vehicle fuel tax (gas tax).

This report examines the impacts of RUC on state Information Technology (IT) systems in various scenarios, the corresponding IT Needs that the state will have in those scenarios, and how these needs may impact RUC policy and legislation going forward.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on May 2, 2019.

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EXECUTIVE SUMMARY

The operational elements of a RUC program—RUC mileage data collection and enforcement mechanisms—will depend on, need to interact with, and thus have an impact on the state’s Information Technology (IT) systems. The policy issue examined in this paper is that RUC design must account for the impacts of RUC on state IT systems, and specifically account for the capital costs of the one-time change orders to update the existing state IT systems.

The paper begins by explaining the topic, and then explains that the Washington Department of Licensing (DOL) is the natural home to the RUC program because it operates the vehicle registry database and because it already supports direct customer interaction (e.g., for registration renewals). Thus, the project team engaged with the DOL to estimate state IT Needs for this paper.

The second section of the paper explains that the IT needs assessment cannot be made in the abstract—it can only be made with specific RUC program designs in mind. To that end, it explains the program design used for IT Needs assessment by DOL, including the mileage reporting methods assumed to be in the RUC program, the business scenarios possible in a RUC program, the first two phases of a potential future RUC program, and a range of lower level assumptions about a potential future RUC program made for the purposes of assessing IT Needs.

The third section of the paper explains the seven categories of IT Needs considered by DOL: Financial, Vehicle Record, E-Services, Letters and Notices, Reports, Interfaces, and Security. It then presents the IT Needs assessment performed by DOL for the three business scenarios presented in the second section, i.e.:

- Scenario A: Fully State Operated RUC system
- Scenario B: Service Provider / State Hybrid RUC system
- Scenario C: Service Provider Operated RUC system with State Oversight

The final section of the paper presents the implications of the IT Needs for RUC program design and legislation. The first conclusion is that a fully state-run system, in which the state provides and manages OBD-II vehicle plug-in

technology, is not desirable. The paper also concludes that a private service provider should provide plug-in device technology. Whether the state or a private company should provide the manual mileage reporting methods is an open question, with pros and cons still to be considered as the RUC market develops and matures. The paper weighs some of the advantages of each possibility.

1 INTRODUCTION

1.1 IT Capabilities and Needs for Road Usage Charging

The operational elements of a RUC program—RUC mileage data collection and enforcement mechanisms—will depend on, need to interact with, and thus have an impact on the state’s Information Technology (IT) systems. Notably, RUC will require new uses of the state’s vehicle licensing registry data—to determine who is RUC liable, to validate vehicle and registration data, and to ensure all RUC owed is collected. These impacts on the state’s IT systems will require changes to be made, which have both cost and time of implementation implications for state, and implications for procurement of potential Service Providers to support RUC.

The policy issue examined in this paper is that RUC design must account for the impacts of RUC on state IT systems, and specifically account for the capital costs of the one-time change orders to update the existing state IT systems. At a minimum, when the RUC system is designed, any design choices on collection and enforcement mechanisms that are incompatible with the state IT framework, or would be prohibitively expensive, should be ruled out. More significantly, for all design choices made for the RUC program, the state must provide resources to the appropriate agencies to make the necessary adjustments to accommodate successful implementation of RUC. Understanding these implications of various design choices on IT needs will help inform whether and how RUC policy moves forward. Note that this paper does not cover staffing or other ongoing costs of operating a RUC system.

Washington State is in the fortunate position of having a vehicle registry system that has been developed according to modern software standards, the new DRIVES system, which is more flexible and scalable than many state vehicle registry systems. The features of this system should be leveraged to the extent possible. However, DRIVES was not designed to implement a RUC system. Thus, changes to the system will be necessary.

The remainder of this introductory section explores the roles of the Washington State Department of Licensing (DOL), and the way in which the project team engaged with the DOL.

The second section of the paper discusses the assumed design of RUC system for the purposes of the IT Needs analysis, including three potential business scenarios for the implementation of RUC. The third section of this paper presents the results of the IT needs analysis for three business scenarios. The final section of the paper presents Implications of IT needs for RUC program and legislation. The paper also contains an Appendix, which contains detailed assumptions made by DOL.

1.2 Role of the Washington State Department of Licensing in Road Usage Charging

DOL will have a major role in any potential future RUC program. That is because the database is also needed to validate vehicle and registrant information. The motor vehicle registry database also serves as the basis for enforcement of any mandatory RUC. Beyond these required IT activities of DOL in support of any RUC program, there are significant reasons to house RUC operations at DOL:

- DOL has a new, very capable motor vehicle registry, a part of the DRiver and VEhicle System (DRIVES).¹ Additional activities, such as those needed to support RUC, could be added to it.
- DOL has experience with operational customer-facing programs, such as vehicle registration, whereas other transportation and tax agencies do not.
- DOL has a network of subagents, who have the potential to provide RUC services to those without smartphones or devices, as they did in the pilot.

For all of these reasons, the IT needs in this paper have been assumed to be all performed by DOL. This does not mean that policy-related activities, such as rate-setting should necessarily be the responsibility of DOL—the advantages listed above only apply to RUC operations.

1.3 Engagement with the Washington State Department of Licensing

Because of the practicality of DOL administering RUC, in order to assess IT needs for RUC operations, the project team engaged with DOL. Specifically, DOL was

¹ <https://www.dol.wa.gov/about/what-is-drives.html>

asked to provide an assessment of hardware and software updates needed by the state in order to accommodate RUC. In order for DOL to make such assessments, they needed to base their estimates on a specific RUC program design. This RUC program design necessarily incorporates decisions not yet made by the Steering Committee or legislators. To accomplish this task, the project team composed a range of design choices based on its best understanding of how a RUC could function, and provided it to DOL. The project team's design choices leveraged lessons learned from operational RUC programs in Oregon, Utah, and New Zealand. These design choices are included in section 2. Section 3 presents the results of the DOL analysis.

2 DESIGN OF RUC PROGRAM FOR IT NEEDS ANALYSIS

As explained in Section 1, the state's IT needs can only be meaningfully assessed through making some basic RUC program design assumptions. Neither the Steering Committee nor the legislature has fully designed a RUC program for future implementation. Thus, in order to complete the task of assessing IT needs, the project team proposed a range of design choices based on its best understanding of how a RUC could best function for Washington. The project team leveraged lessons learned from operational RUC programs in Oregon, Utah, and New Zealand, as well as observations and decisions made to date for Washington.

The project team's assumptions for this exercise are not intended to supersede any recommendations that the Steering Committee or Legislature might adopt—these are simply assumptions to provide a starting point and context that enables DOL to fully engage in the IT Needs exercise.

This section, Section 2, explains all those assumptions. Specifically:

- Section 2.1 discusses existing RUC programs in Oregon, Utah, and New Zealand.
- Section 2.2 explains mileage reporting methods selected for this IT needs analysis
- Section 2.3 describes possible business scenarios for a RUC program
- Section 2.4 explains assumptions about how RUC will be phased in
- Section 2.5 provides high-level assumptions about future RUC program operations in Washington
- Section 2.6 summarizes the contents of this entire section in a table format.

2.1 RUC Program Design for Permanent RUC programs

Permanent RUC programs for light vehicles exist in Oregon, Utah, and New Zealand. Any potential future RUC program implemented in Washington will differ substantially from all these programs due to differences in the policy goals and policy landscape. Nonetheless, these operational RUC programs can serve as a reference point for program design of a potential future Washington State RUC program, and possibly as the basis for some assumptions for a such a program.

2.1.1 Oregon

Oregon's OReGO RUC program has been operational since 2015. OReGO is an opt-in program that allows participants to pay RUC instead of the gas tax, and is statutorily limited to 5,000 vehicles, although currently fewer than 1,000 are participating. OReGO's RUC operations are provided by three service providers—two of which are called Commercial Account Managers (CAMs): Azuga and emovis; and one of which is the State Account Manager (SAM), which is supported by emovis. All mileage reporting, payment collection and related activities are completed by these service providers. The mileage reporting technology is limited to plug-in devices, offering drivers a choice between GPS-enabled or no GPS. OReGO has no mechanisms for enforcement and no connection to state vehicle registry.

2.1.2 Utah

Utah's RUC system will begin operations January 1, 2020. It is an opt-in system by which alternative fuel vehicles may choose to pay RUC in lieu of paying newly introduced flat fees on alternative fueled vehicles. All RUC operations—including mileage reporting and payment collection—will be completed by a service provider, which Utah is currently procuring. Mileage reporting will occur using plug-in devices with GPS. Unlike OReGO, Utah's system will feature a live (near real-time) connection with state vehicle registry and will also include enforcement activities.

2.1.3 New Zealand Diesel RUC

All diesel vehicles registered in New Zealand have paid RUC since 1978, including light vehicles. RUC payments for light vehicles are made through the sale and issuance of paper permits, which are equivalent to the Mileage Permit option

tested in the WA RUC pilot. The New Zealand system was developed, operated, maintained, and enforced by the New Zealand Transport Agency, the country's equivalent of a Department of Transportation.

2.2 Mileage Reporting Methods

This subsection describes the mileage reporting methods assumed to be part of the potential future RUC program for the purposes of estimating DOL's IT Needs.

2.2.1 Automated Mileage Reporting

Automated mileage collection—using an OBD-II plug-in device—is assumed to be a necessary option for of any potential future RUC system for two reasons:

1. Automated mileage collection with GPS location technology is the only way to accurately measure and eliminate RUC charges for travel on non-chargeable areas including travel out-of-state, off-road, and on private roads. While some motorists may prefer not to have GPS, providing this option is vital to a large number of motorists who will not want to be charged for such travel.
2. Automated mileage reporting provides the best option for motorists who do not wish to take any extra action to report mileage information. Indeed, in the pilot, over 2/3rds of participants opted to use some form of Automated mileage reporting.

Automated mileage reporting is assumed to be carried out by plug-in devices, either with or without GPS. Offering plug-in devices with GPS is necessary to enable automated deduction of non-chargeable mileage. Offering plug-in devices without GPS will be more attractive to some participants who are uncomfortable with the use of GPS but nonetheless still prefer an automated mileage reporting option. This non-GPS option can be offered at no additional cost to the state, if plug-in devices with GPS are already offered as part of the RUC program.

For both methods, fuel tax credits are assumed to be used for all vehicles that use liquid fuel, based on actual fuel consumption where data is available, and based on EPA fuel consumption estimates when it is not.

In the future, this option may also include the use of native automaker telematics systems, but this is only feasible with limited vehicle makes and models now, and would require explicit agreements with the automakers. For those reasons, it is not included in the program assumptions.

2.2.2 Manual Mileage Reporting (including role of DOL Subagents)

Manual mileage reporting, featured in the pilot as the Mileage Permit and Odometer Reading is any method of mileage reporting in which the motorist self-reports the vehicle's odometer reading each reporting period (month, quarter or year). Manual mileage reporting is especially important to support vehicles that cannot use OBD-II devices (because they are old, or because they do not have OBD-II ports like the Tesla 3, or because the motorist has another device in the OBD-II port and does not wish to make accommodation for any extra technology in their vehicle). For this IT needs assessment, the Manual methods presumed to be offered included the annual Time Permit and the odometer reading.

The annual Time Permit—paying a high flat fee for unlimited miles—is needed for motorists who do not want to do any reporting at all. It would also provide an option for vehicles with broken odometers. Finally, offering a Time Permit could be used as a default method for motorists who fail to register or report their odometer on time.

The Odometer Reading, in which the motorist self-reports the odometer reading and post-pays for the miles driven, is offered as a simple, per mile RUC method. The Mileage Permit method, in which the motorist pre-purchases blocks of miles, could also be offered instead of or in addition to the Odometer Reading method, but the Odometer Reading is somewhat simpler to explain to motorists and to implement. For the purposes of the DOL IT Needs assessment, no *refunds* for travel on non-chargeable areas (e.g., out-of-state mileage) are assumed. However, fuel tax *credits* are assumed to be available for all vehicles that use gasoline or diesel. The amount of this credit will be calculated based on EPA fuel consumption (MPG) estimates for the reported mileage driven.

As in the pilot, it is assumed that most of the population with a smartphone will report mileage using a smartphone app, but as in the pilot, it is also assumed that DOL sub-agents will provide use of smartphones that motorists can then use to

report mileage. Costs of the smartphones and the app are not included in the estimates in this exercise.

2.3 Three Possible Business Scenarios for RUC in Washington

Recognizing the technology challenges associated with the use of OBD-II plug-in devices, since the beginning of the RUC pilot project, the WA RUC Steering Committee has explored the idea of using commercial Service Providers to perform RUC operations. Indeed, it is notable that the first two operational RUC systems in the US—in Oregon and in Utah—use Service Providers to perform all RUC operations, except for monitoring/oversight at the state government level.

The project team identified three business scenarios in which RUC activities could be organized at a high level, essentially capturing whether the activities are performed by the state or by a commercial Service Provider:

- Scenario A: Fully State Operated RUC system
- Scenario B: Service Provider / State Hybrid RUC system
- Scenario C: Service Provider Operated RUC system with State Oversight

These three scenarios are described below:

2.3.1 Scenario A: Fully State Operated

In this scenario, DOL operates the entire RUC program. It may contract with a supplier for OBD-II plug-in devices and software for processing the data that they generate, but it does not use a Service Provider. To date, this approach has not been adopted by any state RUC program in which devices are used to support road charging payments, but it is important to consider since some people will naturally ask whether the state can (or should) run the RUC program by itself.

2.3.2 Scenario B: Service Provider / State Hybrid

In this scenario, Service Providers are responsible for operating automated mileage reporting methods (plug-in devices) including billing and payment, while DOL operates the manual method including billing and payment. This organizational approach is warranted because automated mileage reporting methods are more complicated and technology-dependent than manual methods,

and can easily be run by a separate entity from the entity that runs the manual methods. DOL would still contract with a firm to provide the smartphone app software required to implement the manual reporting methods that rely on self-reported odometer mileage. This scenario is similar to the diesel mileage permit RUC system used in New Zealand.

In this scenario, the Service Provider could be labeled as an independent entity working on behalf of the state, as the CAMs are in Oregon (Azuga and emovis); or it could be white labelled as a state-run entity, in the same way that Etan operates only under the Washington State Department of Transportation's GoodToGo™ toll branding. This branding of the Service Provider—either as an independent entity or as a state contractor—does not impact the IT needs. Note that to support a potential future open architecture system, it may be advisable for the Service Provider to retain its independent brand. White-labeling the Service Provider as a state entity would function similarly to the way the GoodToGo™ tolling system does today.

2.3.3 Scenario C: Service Provider Operated with State Oversight

In this scenario, all operations are outsourced to the Service Provider for all mileage reporting methods, including billing and payment. This approach is similar to the RUC operations in Oregon and Utah (although those states do not offer any manual reporting options).

As with Scenario B, the Service Provider could be branded as an independent entity working on behalf of the state, and that would not impact the IT needs.

2.4 Possible First Two Phases of RUC Transition

The introduction of RUC to the State of Washington cannot be accomplished in a single year, due to the risk of transitioning so many people at once. Indeed, due to the time period associated with phasing out gas tax bonds of at least 10 and possibly 25 years, it is likely that a full fleet-wide transition to RUC will take a substantial amount of time.

Based on this fact, it was assumed that there would be a gradual transition into the RUC, based on the principle that vehicles whose costs are not currently captured by the gas tax should pay first. These assumptions are not policy

recommendations, but merely initial assumptions used to evaluate IT needs. Further, the precise timing of the phases assumed below is notional.

2.4.1 Phase 1 (July 2021-July 2025): RUC applies to Battery-electric and Plug-in Hybrid Electric Vehicles only

In Washington, a flat annual registration fee of \$150 already exists for plug-in electric vehicles (PEV). While \$50 of that fee is earmarked for general transportation purposes (primarily the construction of public access PEV charging stations), \$100 of it must be used for highway purposes. The assumption for this initial Phase 1 is that this \$100 flat fee earmarked for highway purposes would be replaced with RUC—a usage-based fee—starting in 2021. Providing the RUC as an alternative to a flat fee is being explored both in Oregon and Utah. Ultimately, in Washington this Phase 1 scenario represents about 1% of vehicles registered in the state when the program starts in 2021.

2.4.2 Phase 2 (July 2025-TBD): RUC applies to vehicles over 40 mpg

With the system up and running for four years, in 2025 the RUC can be extended to non-electric vehicles that nonetheless have high fuel economy and currently pay relatively little gas tax.

Additional phases for RUC would certainly be expected after Phase 2 — but the project team did not want to speculate about the further evolution of the RUC so far in the future.

2.5 Assumptions

2.5.1 RUC Program Assumptions

To assist in DOL's IT Needs estimate, a range of further assumptions about how to formulate the potential future RUC system were made, as follows:

- RUC is a new, per-mile Vehicle License Fee (VLF) that would be owed at the time of original vehicle licensing and registration renewal. Upon payment of the RUC VLF, the basic \$30 VLF, passenger vehicle weight fees and other taxes or fees owed, DOL would issue a registration sticker (same as current practice). The main reason for this approach is that categorization of RUC as a VLF allows a transition away from the gas tax while allowing the gradual elimination of gas tax-only bonding.

- Enforcement: Failure to report miles would be treated in same manner as toll violations, including leading to a registration hold after two notices of violation have been issued. Very large outstanding RUC invoices and ignored registration holds could eventually result in vehicle impoundment. The main reason for this assumption is to have minimal impact on the state police.
- The amount of RUC owed will be based on an assumed rate of 2.4 cents per mile, for all mileage that is not otherwise exempt. The main rationale for this mileage rate is that it was calculated to achieve simple “revenue neutrality”, so that the average driver would pay the same amount per mile under RUC as they currently do under the gas tax. This rate is for test purposes only and must be recalculated based on new metrics and policy directives from the legislature prior to any implementation of a RUC system.
- A fuel tax offset will be applied against RUC owed for assumed fuel taxes paid. In this fashion, payment of gas taxes at the pump are treated as “pre-payment” for RUC. The main reason for this assumption is because the state cannot legally repeal and replace the existing gas tax until all bonds that have pledged the gas tax have been repaid. However, a RUC is intended only as an alternative to the gas tax – not an additional tax. Allowing gas taxes paid to offset the total amount of RUC owed would allow the state to remain legally compliant with the bond requirements while still ensuring that no driver “double pays” for all miles under RUC, plus an additional amount (the gas tax). The offset is calculated as follows:
 - For automated methods in which fuel consumption can be measured by the plug-in device, the measured value will be credited against any RUC owed;
 - For manual methods and cases in which fuel consumption cannot be measured with a plug-in device, the number of self-reported reported miles, divided by combined EPA city/highway MPG (or MPGe for PEVs) is used to provide gallons of fuel consumed and the gas tax paid will be credited against any RUC owed;

- For both manual and automated methods, the amount of the gas tax credit is based on the State of Washington’s current fuel tax rate of 49.4 cents per gallon.
- RUC will only apply to passenger vehicles – not to vehicles that are subject to combined licensing (heavy commercial vehicles). This has been the assumption of the Steering Committee since it launched its initial assessment of RUC in 2012.

2.5.2 Assumptions about Estimates

DOL made the following high-level assumptions about their estimated needs, cost drivers, and impacts:

- The estimates only include IT hardware and software needs. These estimates do not include any staffing required by DOL to support RUC, nor any costs for the Service Provider, nor any type of software app-based support.
- The estimates are based strictly on the assumptions and information provided by the RUC project team.
- DOL made further detailed assumptions, included in the Appendix to this report.
- DOL presents the cost estimates as being within a 50% margin of error.

2.6 Summary of IT Needs

	Scenario A: Fully state-run	Scenario B: Service Provider/State hybrid	Scenario C: Service Provider Run with state oversight
Who pays	<ul style="list-style-type: none"> ● Phase 1: beginning July 1, 2021: All Plug-in and Electric Vehicles (except neighborhood electric vehicles). ● Phase 2: beginning July 1, 2025: All passenger vehicles with a city/highway EPA fuel economy rating of 40 MPG or higher. 	<ul style="list-style-type: none"> ● Same as Scenario A 	<ul style="list-style-type: none"> ● Same as Scenario A

Fee type	<ul style="list-style-type: none"> RUC is implemented as a new type of vehicle license fee 	<ul style="list-style-type: none"> Same as Scenario A 	<ul style="list-style-type: none"> Same as Scenario A
Fuel tax offset	<ul style="list-style-type: none"> Calculated and applied by DOL 	<ul style="list-style-type: none"> Calculated and applied by DOL for manual methods, Service Provider for Automated methods 	<ul style="list-style-type: none"> Calculated and applied by Service Provider
Mileage reported by/to	<ul style="list-style-type: none"> By the vehicle owner/lessee, to DOL 	<ul style="list-style-type: none"> For Manual Methods: By vehicle owner/lessee, to DOL For Automated methods: By vehicle owner/lessee to Service Provider 	<ul style="list-style-type: none"> By vehicle owner/lessee, to Service Provider
Automated mileage reporting with plug-in mileage meter (with & without GPS)	<ul style="list-style-type: none"> DOL acquires and manages inventory of all mileage meters DOL provides web portal DOL processes all mileage reports DOL provides all Billing and Payment 	<ul style="list-style-type: none"> Service Provider provides all mileage meters Service Provider provides web portal Service Provider processes all mileage reports Service Provider provides all Billing and Payment 	<ul style="list-style-type: none"> Service Provider provides all mileage meters Service Provider provides web portal Service Provider processes all mileage reports Service Provider provides all Billing and Payment
Manual mileage (time permit, odometer reporting)	<ul style="list-style-type: none"> DOL processes all mileage reports DOL provides all Billing and Payment 	<ul style="list-style-type: none"> DOL processes all mileage reports DOL provides all Billing and Payment 	<ul style="list-style-type: none"> Service Provider processes all mileage reports Service Provider provides all Billing and Payment

3 RUC IT NEEDS UNDER THE THREE SCENARIOS

3.1 Seven Categories of IT Needs

IT Needs include changes to DOL’s systems in the seven categories described in this table

IT Category	Description
Financial	How the system handles financial transactions, including calculating amounts owed
Vehicle Record	How the system displays the vehicle record, including whether a vehicle is liable for a certain fee
E-Services	A range of online services for users, including payment, receipt records, and odometer records
Letters and Notices	How the system generates letters and notices to be sent to users
Reports	How the system generates summary reports for internal and external review
Interfaces	How the system interfaces with other systems
Security	Reviews of system security to ensure changes made do not create security vulnerabilities

For each of the seven categories, the following sections provide the person-hours of labor needed for a one-time capital update of the state IT system to support the scenario. It does not include ongoing operating costs.

3.2 Scenario A: Fully state-run

3.2.1 Phase 1

Category	Description of Changes	Person-hours of labor
Financial	Pricing logic to charge and distribute the new fee for qualifying vehicles. Includes: cashiering receipt, logic to stop renewals if payment not received, automated	300

	billing, carry over of road usage in certain circumstances and allow shortages and refunds.	
Vehicle Record	New logic and screen changes to create a new indicator and banner for vehicles subject to road usage charge, require odometer reading and miles travelled out of state, and new activity to allow record corrections. Change also includes a new fleet activity to allow fleet to pay in one transaction including supplying odometer and miles travelled out of state and a new work item for vehicles sold and transferred out of state, including a case to audit customer record	480
E-Services	Modify various online services, that include creating a new online payment tool to accept road usage charges, report of sale, e-permitting, new road usage charge calculator to estimate fee that might be due, and system used by registered tow truck operators, wreckers, scrap processors, and insurance companies to require odometer and miles travelled out of state if applicable.	348
Letters and Notices	Modify or create new letters or notices. Changes include renewal notices, fleet notices, new billing letters, audit case and a one-time letter notifying owners of the new requirement	190
Reports	Create new reports for management of the road usage charge program, includes reports for the audit case.	80
Interfaces	New interface to receive data from software for OBDII devices. Estimate is only for a basic single mileage interface—not complete.	100
Security	Security analysis that includes review of security architecture, engineering and risk assessments to implement new program	100

3.2.2 Phase 2

In Phase 2, updates to the system are needed in the Financial, Vehicle Record, E-Services, Letters and Notices, and Reports categories to capture the vehicles newly subject to the RUC

Category	Description of Changes	Person-hours of labor
(Multiple)	Modify pricing logic for new vehicles subject to the fee, billings, template, online services changes and a onetime update to records subject to the fee	300

3.2.3 Analysis

Total estimated development hours = 1,538

Total estimated security review hours = 100

Total Cost: \$ Indeterminate

Duration of development: Indeterminate

In the additional assumptions section presented in the Appendix, DOL states: “the department does not have enough information to estimate the cost to implement an automated solution such as using an OBDII device to collect mileage readings. This option requires that the program be management and solely implemented by the department and would not include commercial service provider management of the device or software used to collect data from the devices.”

There is currently no OBD device provider offering the service required by DOL for it to operate the OBD-II devices themselves, as this scenario requires. That means that the OBDII device provider would offer not only the devices, but would also need to support the software to perform mileage calculations, including a software portal on which motorists could look up their records. The lack of such an offering alone makes this scenario difficult to achieve.

Customer service and payments would also be left to DOL in this scenario. DOL would need to train staff on the intricacies of the operation of the OBDII device. DOL would likely need to maintain and distribute a large inventory of plug-in devices, both GPS-enabled and non-GPS devices. And DOLs payment system would need to be integrated with the OBDII device data records, some of which is reflected in DOL’s estimate, but much of which may not be.

For these reasons, this Scenario A is undesirable and not recommended for further consideration.

3.3 Scenario B: Service Provider/State hybrid

3.3.1 Phase 1

Category	Description of Changes	Person-hours of labor
Financial	Pricing logic to charge and distribute the new fee for qualifying vehicles. Includes: cashiering receipt, logic to stop renewals if payment not received, automated billing, carry over of road usage in certain circumstances and allow shortages and refunds.	300
Vehicle Record	New logic and screen changes to create a new indicator and banner for vehicles subject to road usage charge, require odometer reading and miles travelled out of state, and new activity to allow record corrections. Change also includes a new fleet activity to allow fleet to pay in one transaction including supplying odometer and miles travelled out of state and a new work item for vehicles sold and transferred out of state. Creates a new case used to audit service provider, and new activity to modify requirement in certain circumstances.	530
E-Services	Modify various online services, that include creating a new online payment tool to accept road usage charges, report of sale, e-permitting, new road usage charge calculator to estimate fee that might be due, and system used by registered tow truck operators, wreckers, scrap processors, and insurance companies to require odometer and miles travelled out of state if applicable.	348
Letters and Notices	Modify or create new letters or notices. Changes include renewal notices, fleet notices, new billing letters, audit case and a one-time letter notifying owners of the new requirement	190
Reports	Create new reports for management of the road usage charge program, includes reports for the audit case.	80

Interfaces	Provide commercial service provider data on vehicles subject to the fee, including receiving return data from the provider for activities related to vehicles imposed the fee	220
Security	Security analysis that includes review of security architecture, engineering and risk assessments to implement new program	100

3.3.2 Phase 2

Category	Description of Changes	Person-hours of labor
(Multiple)	Modify pricing logic for new vehicles subject to the fee, billings, template, online services changes and a onetime update to records subject to the fee	300

3.3.3 Analysis

Total estimated development hours = 1,708

Total estimated security review hours = 100

Total Cost: \$1,015,300

Duration of development: 25 months

Unlike Scenario A, this scenario is feasible and desirable. DOL's provision of the manual methods offers a natural fit with using the local Vehicle Licensing Offices (VLOs, or subagents) to cover the participants who would not want to use a smartphone to report. This combination also creates an option to choose the state as a RUC provider, which will appeal to some motorists. From an economic perspective, assuming that there will only be one service provider to offer manual methods also seems logical, since that method does not involve many opportunities for customization of the product or service delivery, and may not attract multiple Service Providers to provide this service in any event. Indeed, the approach and assumptions reflected in this Scenario B echoes the RUC system implemented in New Zealand.

DOL requires 25 months from the initiation of this project to the time it will be ready for live operations to begin. So, to begin on July 1, 2021, DOL would need to be given a green light by June 1, 2019, which will not happen. Based on the legislative schedule, the earliest possible project start date would be in 2022.

Whether the Service Provider would be branded as a state entity or a private entity could be decided later, but labelling it as a private entity would support the future establishment of an open market approach for the provision of RUC services to government, which is expected to drive down operational costs for future RUC services.

3.4 Scenario C: Service Provider Run with State Oversight

3.4.1 Phase 1

Category	Description of Changes	Person-hours of labor
Vehicle Record	Vehicles changes that include creating a new case used to audit service provider, including a new activity to allow users to manually record payment received in certain circumstances, activity to stop renewals, and new indicator and banner for vehicles subject to the road usage charge	250
E-Services	None	0
Letters and Notices	Letters changes that includes new letters for the audit case.	20
Reports	Create new reports for management of the road usage charge program.	30
Interfaces	Interfaces change to provide commercial service provider data on vehicles subject to the fee, including receiving return data from the provider for activities related to vehicles imposed the fee.	220
Security	Security analysis that includes review of security architecture, engineering and risk assessments to implement new program	100

3.4.2 Phase 2

Category	Description of Changes	Person-hours of labor
(Multiple)	Modify logic for new vehicles subject to the fee.	20

3.4.3 Analysis

Total estimated development hours = 540

Total estimated security review hours = 100

Total Cost: \$ 365,300

Duration of development: 10 months

Like Scenario B but unlike Scenario A, this Scenario C is also feasible and desirable. Relying entirely on Service Providers for mileage reporting and payment operations is the approach taken in both Oregon and Utah. For economic reasons described earlier in Scenario B, the provision of manual methods would likely be limited to one service provider (assuming multiple service providers are contemplated).

With an implementation time of about 10 months, this approach would be faster to realize than Scenario B. However, it would not provide a state-run payment option, although whether the Service Provider would be branded as a state entity or a private entity could be decided later. As in Scenario B, branding the Service Provider as a private entity would support the later establishment of an open market.

4 IMPLICATIONS OF DOL'S INFORMATION TECHNOLOGY NEEDS FOR RUC PROGRAM AND LEGISLATION

4.1 A Service Provider is Needed for Automated Reporting

As discussed above, a Service Provider is needed to implement Automated Reporting at this time. No OBD-II device providers offer a service that would allow the DOL to accomplish the financial, customer service, or device management activities needed for it to carry out this responsibility. Even if an OBD-II device provider could be found who would provide this service, it is not certain that there would be any net savings on the service compared with the full-service provision included in Scenarios B and C. That is because the existing Service Providers have geared their product offerings toward full service provision.

Moreover, DOL could not easily provide customer service for OBD-II devices or device management. Potentially, DOL could use its payment platform. However, it is possible that OBD-II vendors would not want to split out their RUC payment processing from their RUC mileage reporting systems for a small system, both because they are so entwined with one another that splitting them out may be a lot of effort, and because they feel that they may not make a sufficient profit if they do.

For these reasons, a Service Provider is needed to provide automated reporting, whether it is branded as a government entity or a private entity.

4.2 Choice Between Service Provider and State for Manual Reporting

Thus, the major choice that must be made prior to implementation is whether the state or a Service Provider offers manual reporting.

Manual reporting seems to be a natural fit for the state for several reasons. The annual Time Permit is very similar to vehicle registration, and it does not require any mileage information. In essence, drivers who choose this option would simply pay the additional RUC amount at the same time as they renew their vehicle

license.² The Odometer Reading method would only add one new data point—the odometer reading. Second, it may not make sense to have competing manual method providers. That is because there is little room for service providers to differentiate their services, multiple providers of the identical service to motorists could confuse them. Third, due to the need to engage with the Vehicle Licensing Offices DOL may be better positioned to operate manual methods. Finally, some citizens will prefer a state-operated method.

The main reason for choosing to have a Service Provider run manual method system would be to save costs. However, it is not clear that significant cost savings would be achieved. Possibly, engaging the potential service provider market could help inform this choice by providing more information on the precise cost differences between a state-run manual method system and one that is run by Service Providers. Due to the existing connection with VLOs, and because the changes to DOL's systems to operate manual methods are feasible and not exorbitantly expensive, it is not clear that there would be significant cost savings achieved by outsourcing the manual method operations to a service provider. Again, market outreach to potential service providers could help answer this question.

² Offering shorter-term time permits, such as those that could support out-of-state visitors in a scenario in which the gas tax is eliminated, would require additional changes to the system not included here. However, as the gas tax will continue for over two decades, such changes are not imminently needed.

APPENDIX: DETAILED DEPARTMENT OF LICENSING ASSUMPTIONS

The following are the detailed assumptions made by DOL when creating their estimates:

1. Scenario A only – the department does not have enough information to estimate the cost to implement an automated solution such as using an OBDII device to collect mileage readings. This option requires that the program be management and solely implemented by the department and would not include commercial service provider management of the device or software used to collect data from the devices.
2. Scenario B and C only – The commercial service provider will provide all data on a daily basis, or as required by the department for any vehicles they are managing payment of the road usage charge.
3. Scenario C only – The commercial service provider will send a one-time letter notifying them they are required to provide odometer reading for road usage charge. The department will create the letter for Scenarios A and B.
4. Business will establish a threshold that must be met before a final billing is created. If not met, a work item will be created for review of record.
5. When a customer signs up for a payment plan, it cannot be done through an online anonymous transaction.
6. Any road usage charge implemented must include an automatic option to collect mileage, such as using OBII devices.
7. Customers who sign up for electronic renewal notices will be automatically signed up for road usage charge electronic billing notices.
8. The road usage charge must be paid in full before the customer can renew their registration.

9. If the road usage charge is not paid in full, the customer will be prevented from renewing similar to the process for vehicle violations.
10. No penalty fee if payment is not made or is paid late.
11. Odometer reading can be provided in an office, online during report of sale or renewal transactions, and at headquarters, includes collecting out of state miles travelled.
12. DOL will send late notices to customer through a special mailer for missed payments.
13. Filing fee (\$5) is due for each payment as part of the payment plan made at a vehicle licensing office, headquarters or online.
14. A new filing fee will be created to ensure fee equalization if the customer pays to the service provider.
15. Any shortage will use the existing shortage process.
16. Road usage charge can be refunded, a shortage or a dishonored payment in certain circumstances. However, the road usage charge cannot be refunded if the owner chose to the unlimited miles option. The fee paid for unlimited miles does not transfer to the new owner if the vehicle was sold.
17. The customer cannot buy miles. The charge is based on actual mileage travelled.
18. The customer cannot change from an automated device to manual reporting in the middle of a payment cycle. They can only change at the beginning of the new payment cycle.
19. Road usage charge will be based on when the original or title transaction is processed or dealer date of sale to determine begin date of billing period.
20. Vehicles exempt from annual registration must pay the road usage charge, includes government vehicles.

21. Road usage charge rate will be the same for phase 1 and phase 2, including for government or vehicles current exempt from vehicle licensing fees.
22. Road usage charge will not be prorated.
23. Road usage charge is due if a report of sale, affidavit of sale or transfer is completed.
24. Road usage charge is a vehicle licensing fee.
25. The road usage charge payment is a separate transaction from a renewal payment and must be paid separately. If done on the same day, the office would receive two service fees.
26. The cost to contract with a service provider is not included in this estimate.
27. Scenario B and C only – The department will not handle any technical, installation, or customer related inquiries regarding an OBD-II device. It will be handled by the commercial service provider.
28. Research and Planning office and business area will define data elements for new report(s).
29. Road usage charge will not be collected at time of renewal, but be a separate billing because DOL cannot bill for what we do not know and renewals are produced 2 months before they are due.
30. Road usage charge will not be included on renewal notices, but notices will include a special message the fee must be made before the vehicle can be renewed.
31. Title, report of sale and odometer disclosure and/or affidavits of sale will may be modified by the business area to include new language that the odometer requiring and out of state miles travelled is required.
32. Business will create a new attestation form to declare odometer readings and out of state miles travelled.

33. The department will use data from Vintelligence to identify what vehicles are subject to the road usage charge for phase 1 and phase 2, including to determine the calculation for the fuel tax offset.
34. Road usage charge is in addition to current electric vehicle fee.
35. For phase 2, light duty truck threshold is based on gross weight purchased, not gross vehicle weight rating or scale weight.
36. Road usage charge is collected in arrears, unless the owner chooses to pay for unlimited miles travelled.
37. Business will create a form to be used for attestation.
38. Need to perform a security analysis because odometer information is considered sensitive data.
39. If a report of sale is added to the record, affidavit of sale or title transfer occurs, a final billing will be created for that vehicle that vehicle.
40. If a report of sale or affidavit of sale is cancelled/deleted, the owner is responsible for any RUC VLF owed during the time frame from the point the report or affidavit was filed and then cancelled/deleted.
41. If there is no odometer reading on record, the system will default and charge the customer the unlimited miles fee option by default.
42. Business will define the rules if an insurance destroyed report is received on if the road usage charge is due or not due.
43. DOL will not collect the road usage charge from new or used dealers for vehicles for vehicles they have for sale.
44. If the vehicle is transferred and vehicle exempt from plate replacement because transferred to a family member, the prior owner is still responsible for RUC VLF up to the point the ROS done, or vehicle transferred. Assume in some cases, it may carry over such as remove owner.





A-13

USE OF PRIVATE SECTOR SERVICE PROVIDERS TO COLLECT RUC

 **WA RUC**



Use of Private-sector Service Providers to Collect RUC | **DRAFT**



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PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee's consideration as they begin to deliberate whether or how the state of Washington could transition to a per-mile fee system as a future replacement for the state's motor vehicle fuel tax (gas tax).

The information contained in this report examines the criteria for assessing whether a legislatively-adopted road usage charge program should use private-sector service providers, a government agency or some combination to collect mileage data and the road usage charge from motorists subject to it. Should the state decide to use private-sector service providers for collection roles, additional issues arise such as whether there should be only one private-sector service provider or an open market of multiple private-sector providers to instill continuous competition within the RUC collection mechanism. This paper will assess these possibilities.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on June 27, 2019.

For this report, all footnotes and citations appear at the bottom of the page to improve readability.

EXECUTIVE SUMMARY

The purpose of this report is to examine five RUC delivery configurations for collection of mileage data and a road usage charge from payers, with the following objectives:

- ▶ Develop criteria for assessing the collection of mileage data and a road usage charge from payers under various RUC delivery configurations.
- ▶ Apply the criteria for collection of mileage data and a road usage charge under the three categories of possible delivery configurations:
 - Fully state operated RUC system
 - Private-sector service providers operated RUC system with state oversight:
 - Service provider/state hybrid RUC system:
- ▶ Determine the most advantageous delivery configuration for collection of mileage data and a road usage charge under various preferences.
- ▶ Determine a transition pathway for achieving the most advantageous delivery configuration for collection of mileage data and a road usage charge under various preferences.

This paper assesses the possibilities for delivery of a RUC system for a state. Chapter 3 describes five configurations for delivery of the revenue collection functions for a RUC system. Chapter 4 defines the criteria for assessment of the five configurations. The assessment undertaken in chapter 5 applies these criteria to inform selection of the delivery mechanism for a fully mature, final end state RUC system.¹ In other words, the chapter 5 assessment suggests answers to the question, “What is the best delivery mechanism for a RUC program after government has refined its oversight and administrative systems and RUC is broadly mandated for all, or substantially all, new passenger vehicles?”. Chapter 6 determines the transition pathways to a fully mature, final end state for a RUC program.² Chapter 7 identifies legal elements required for the

¹ The complete detailed analysis of how the assessment criteria apply to each delivery configuration is contained in Appendix A.

² The complete detailed analysis of how the transition criteria apply to each transition pathway is contained in Appendix C.

state of Washington to enable third parties to act on behalf of the state to collect mileage data and a road usage charge.

The high-level operational elements of a RUC system are:

- Customer service and account management
- Charge identification and processing
- Compliance, enforcement, and audit
- Maintenance and operation of the vehicle registry
- Oversight of the system activities, including monitoring and reporting.

This assessment covers private sector involvement for two of the five high-level operational elements of a RUC system: (1) customer service and account management and (2) charge identification and processing. This paper assumes the other three elements—compliance, enforcement, audit; maintenance of the vehicle registry; and oversight—remain largely or entirely the purview of the state.

The five configurations for delivery of the customer service and account management and charge identification and processing functions in a RUC system are contained in the following table:

Configurations	RUC System Delivery Description
Configuration 1	Government agency-only delivery
Configuration 2	Single private-sector services provider delivery
Configuration 3	Open market private-sector services provider delivery
Configuration 4	Combination of government agency-only delivery and open market for private-sector provider delivery
Configuration 5a*	Combination of government agency delivery and single private-sector provider delivery under a closed system
Configuration 5b*	Combination of government agency delivery and single private-sector provider delivery under an open system

Assessment Criteria. This paper uses these 32 assessment criteria (see table 4-2 for a list of the criteria) grouped into six categories to orient assessment of each of the five most likely RUC system configurations. These six categories are as follows:

- ▶ Administrative effectiveness,

- ▶ Participant experience,
- ▶ Operational performance,
- ▶ Practical availability,
- ▶ Flexibility, and
- ▶ Policy alignment.

Assessment of the Five Configurations. Through application of 32 assessment criteria, the assessment finds that government-only delivery (configuration 1) is desirable for providing manual reporting options but not for provision of a range of technology options. Single private-sector provider delivery (configuration 2) has no advantages in a final end state, but may enable transition to a fully mature program by temporarily providing technology options and account management services requiring advanced technical expertise in a RUC program's initial stages. An open market for multiple private-sector service providers (configuration 3) is best for a large RUC system in need of technology evolution and cost reductions that come from private sector competition. An open market combined with government provision of an additional service option (configuration 4) will also be desirable for a large system with an ability to mix manual reporting options provided by private-sector service providers with automated reporting options provided by the government. Thus, configurations 1, 3 and 4 are the preferred delivery configurations. Which configuration is the best will be determined by the nature of the RUC system adopted.

Transition. While it is possible for a RUC system to begin at its final end state, the likelihood is low. Rather than undertake the risky proposition of mandating RUC for a substantial portion of the vehicle fleet, a wiser strategy suggests beginning with an initial, short-term configuration by adding vehicles into the program in increments over time. In this way, the general driving public familiarizes itself with the RUC program in small bites as the RUC system expands into complete coverage over a number of years.

Assessment of the four transition pathways to a final end state for a RUC program reveals that the best transition pathway depends upon the preferred RUC delivery configuration. The transition pathway question for each preferred delivery configuration yields a different answer.

For government-only delivery (configuration 1), the best transition pathway is procurement of a *single, private-sector service provider for a limited duration (transition*

pathway 2) operating under an open system adopted by the government. Although not foundational to the final end state of government operations, a single private-sector service provider offers the greatest certainty and simplicity, and allows transferability to the ultimate government-operated RUC system.

For the configuration of an open commercial market for multiple service providers (configuration 3), the best transition pathway is *a single, private-sector service provider as the first entrant into an open commercial market with open system performance standards adopted at the beginning of the program* (transition pathway 3). Transition pathway 3 would lead to an easy transition to an open commercial market, better meeting the criteria for foundation, adaptability, ease of implementation and timeliness than any other transition pathway. As the first entrant into an open market, a single provider could simplify the work of a single state government by removing or reducing the procurement and oversight responsibilities of regulating an open market and managing multiple private-sector providers.

For the configuration for a *combination of government agency and private-sector open market* (configuration 4), the best transition pathway is a combination of government agency and procurement of a single, private-sector service provider as the first entrant into an open commercial market with the same open system performance standards as the ultimate open commercial market (transition pathway 4). The other transition pathways will prove cumbersome because there will be more complexities and risk by either adding the government functions or adopting the specific open system performance standards required for an open commercial market at a later time.

In summary, rather than commence in a final end state, the RUC system will likely start with a transition pathway that leads to one of the three preferred delivery configurations. The optimal transition pathway differs depending upon the recommended final end state delivery configuration under consideration.

- ▶ For *government-only delivery* (configuration 1), the optimal pathway would be a single, private-sector service provider for a limited duration operating under an open system adopted by the government. (transition pathway 2).

- ▶ For *open commercial market for multiple private-sector providers delivery* (configuration 3), the optimal pathway would be a single, private-sector service provider as the first entrant into an open commercial market with open system performance standards adopted at the beginning of the program (transition pathway 3).
- ▶ For *a combination of government agency and open market for multiple service providers delivery* (configuration 4), the optimal pathway would be starting with a combination of government agency and procurement of a single, private-sector service provider as the first entrant into an open commercial market with the same open system performance standards as the ultimate open commercial market (transition pathway 4).

1 Introduction

1.1 WA RUC Steering Committee interest private-sector service providers to collect mileage data and road usage charges

The Legislature authorized investigation of a per-mile road usage charge (RUC) with the intent of studying a funding mechanism as a potential future replacement for the state’s motor vehicle fuel tax (“gas tax”).³ With increases in vehicle fuel economy and quicker adoption of alternative-fuel vehicles, a transportation funding system dependent on gasoline sales will face declining revenue per mile, drawing into question whether the current gas tax system of roadway funding is financially sustainable or fair over the mid and longer term.

Throughout its deliberations, the Washington Road Usage Charge (WA RUC) Steering Committee has identified policy issues for resolution before enactment of a per-mile RUC. One of those issues is to understand the best way to administratively collect a road usage charge. Configuration options include government agency collection, a single private-sector service provider collection, collection by private-sector service providers in an open, competitive market, or combinations of government agency and private-sector service provider collection. This report provides analysis of each configuration option for Steering Committee consideration.

1.2 Importance of delivery configuration for a RUC system

The delivery configuration for a RUC system will impact costs, timetable for system implementation, risks, and complexity. The Steering Committee preferred to work with private service providers in the demonstration phase of the WA RUC Pilot Project. This was based on the prior work done elsewhere, primarily in New Zealand and Oregon, to develop approaches and models for private-sector provision of RUC services through an open market. Although difficult to simulate an open, competitive market in a limited-term trial with no real financial stakes, a pilot does allow competing service providers to offer choices to motorists. The WA RUC pilot featured two private-sector service providers

³ 2012 Supplemental Transportation Budget, Chapter 86, Laws of 2012, at section 205, subsection (4),

offering five mileage reporting methods along with the customer service and charge processing functionality for volunteer participants.

Assessment and understanding of the tradeoffs made with the use of private service providers aids development of a policy that guides future procurement for RUC systems. This understanding also assists defining the roles and responsibilities for state agencies either to buy, test, own, and operate a system, or to supervise and monitor the performance of private firms that do so.

1.2.1 Research approach

The WA RUC Pilot Project featured two private-sector service providers using a mix of specialized and off-the-shelf commercial technology and systems to deliver the mileage reporting methods in a *simulated open market* with a data collection hub. WA RUC volunteer drivers chose their service provider and technology for customer service, account management, charge identification and processing.

An *open market* allows private-sector service providers to engage in continual competition, entering and exiting the open market at will. A government agency procures qualified private-sector service providers to participate in the open market. A private-sector provider qualifies for participation in the open market by proving its capability to meet the standards through a certification process. This paper references simulations of open markets undertaken in various RUC pilots and programs but the reader should recognize the virtual impossibility for any limited-budget pilot test or program to truly simulate an open market, operationally or financially, with a short duration or limited number of participants.

To complete the research for this paper, the project team undertook several parallel analyses, including an assessment of the state IT system needs and costs of a RUC system under various scenarios, development of a range of possible state organizational designs for implementing a RUC, and this analysis of private-sector provision of RUC services. Specifically, this paper analyzes the experience of pilot participants, including their understanding of the choices available and their preferences. Experience in other jurisdictions were gathered and assessed against criteria to test the merits of various delivery configurations. This research also identified legal elements required for the state

of Washington to enable third parties—private-sector service providers—to act on behalf of the state to collect RUC.

1.2.2 Objectives

This paper examines delivery configurations for collection of mileage data and a road usage charge from payers, with the following objectives:

- ▶ Develop criteria for assessing the collection of mileage data and a road usage charge from payers under various RUC delivery configurations.
- ▶ Using available evidence and knowledge, apply the criteria for collection of mileage data and a road usage charge under five possible configurations:
 - Fully state operated RUC system
 1. Government agency-only configuration
 - Service provider operated RUC system with state oversight:
 2. Single private-sector service provider configuration
 3. Multiple service provider configuration in an open market
 - Service provider/state hybrid RUC system:
 4. Combination of government-agency and open market private-sector service providers configuration.
 5. Combination of government-agency and single private-sector service provider configuration
- ▶ Determine the most advantageous delivery configuration for collection of mileage data and a road usage charge under various preferences.
- ▶ Determine a transition pathway for achieving the most advantageous delivery configuration for collection of mileage data and a road usage charge under various preferences.

The rudiments of an open market for RUC services have already appeared. Oregon's OReGO program currently has two commercial account managers under contract, one of whom is also under contract for services for the Utah RUC program. The WA RUC pilot project used a third private-sector entity to provide RUC services. These firms, in various combinations, have also provided, or will provide, RUC services for the California Road Charge Pilot Program and other RUC pilot demonstrations in Colorado, Pennsylvania, Delaware and Minnesota. The membership of the Washington D.C. based Mileage

Based User Fee Alliance indicates there are other firms interested in joining the RUC market once it reaches a certain level of maturity. This may mean promise of a sizable number of participating RUC payers and access to a perpetually open market, upon a firm's certification of capabilities to meet performance criteria, that will allow entry and exit at will.

This paper assumes that the state of Washington prepares a viable business case that will attract private-sector service providers to offer their services to the RUC program during solicitation under any of the various delivery configurations. This paper also assumes that the procuring government agency does due diligence to ensure that the private-sector service providers contracted under any configuration are financially and technically robust to sustain operations at a large scale.

1.2.3 Methodology

This paper assesses the possibilities for delivery of a RUC system for a state. Chapter 3 describes the five configurations for delivery of the revenue collection functions for a RUC system. Chapter 4 defines the criteria for assessment of the five configurations. The assessment undertaken in chapter 5 applies these criteria to inform selection of the delivery mechanism for a fully mature, final end state RUC system.⁴ In other words, the chapter 5 assessment suggests answers to the question, "What is the best delivery mechanism for a RUC program after government has refined its oversight and administrative systems and RUC is broadly mandated for all, or substantially all, new passenger vehicles?". Chapter 6 determines the transition pathways to a fully mature, final end state for a RUC program.⁵ Chapter 7 identifies legal elements required for the state of Washington to enable third parties to act on behalf of the state to collect mileage data and a road usage charge.

⁴ The complete detailed analysis of how the assessment criteria apply to each delivery configuration is contained in Appendix A.

⁵ The complete detailed analysis of how the transition criteria apply to each transition pathway is contained in Appendix C.

2 BACKGROUND

2.1 Collection of taxes and fees in the United States

For an entity to collect taxes, fees, tariffs or any other revenue⁶ for public purposes, the entity must have the ability to identify and interact with the payers and the data for determining the tax amount, the authority to issue tax invoices and collect the tax, and a place to forward the revenue. In most cases, the entity must also have an ability to account for whether the tax invoices are paid and ensure compliance.

Most tax and fee systems that generate revenue for public purposes in the United States use government agencies and personnel to collect revenue in various authorized ways. Property taxes, income taxes, and fuel excise taxes are collected in this manner as well as fees for hunting and fishing licenses, permits for construction and air emissions, and many other activities.

It is also common in the United States for authorized private-sector entities to collect revenue on behalf of the government. Sales taxes, for example, are collected from the payer by private-sector retailers who then forward the revenue collected to a government agency. The retailer collects the data necessary to calculate the tax—the sales amount—then applies the sales tax rate, collects the tax as part of the transaction and forwards the total taxes collected from multiple transactions to a government agency.

2.2 Collection of a road usage charge

At present, the state collects fuel excise tax and registration fee revenue directly. In the case of the fuel tax, the Department of Licensing collects revenue from fuel distributors, who then pass the cost along the supply chain, ultimately to the end consumer. If there is a transition toward RUC, the use of private-sector service providers would represent a change from the status quo.

Five high-level operational elements of a RUC system are:

- 1) Customer service and account management
- 2) Charge identification and processing

⁶ For purposes of this paper, all types of revenue will be referred to as “taxes.”

- 3) Compliance, enforcement, and audit
- 4) Maintenance and operation of the vehicle registry
- 5) Oversight of the system activities, including monitoring and reporting.

This paper focuses on provision of the first two operational elements. Both government agencies and private-sector entities have the capabilities to provide customer service and account management and charge identification and processing.

The vehicle registry is a natural state monopoly. Since proper identification of vehicles and their owners is necessary for association of an owner and vehicle to a RUC account, enforcement and audit are inherently best suited to state provision. Oversight is necessarily a state function because only the state has a duty to ensure the public interest is met. Customer service and account management, and charge identification and processing, however, may be delivered by a private sector entity.

3 Configurations for Delivery of Revenue Collection Functions in a RUC System

This chapter presents five configurations for delivery of the customer service and account management and charge identification and processing functions in a RUC system. States either operate, or have tested operations for, each of these configurations whether for passenger-vehicle RUC or heavy vehicle weight-distance tax. The essential configurations are:

1. Government agency-only configuration
2. Single private-sector service provider configuration
3. Open market private-sector service providers configuration
4. Combination of government-agency and open market private-sector service providers configuration
5. Combination of government-agency and single private-sector service provider configuration

3.1 Government agency-only configuration

For collection of RUC solely by a government agency (configuration 1), the agency must have the ability to identify and interact with the payers, the ability to accumulate the data necessary for collection of RUC, and collection authority. The agency must also have sufficient resources such as personnel (technical, communications, management), computer systems, a data management database and data management tools.

Four states in the United States use solely government agencies to collect a road usage charge for heavy vehicles called the weight-mile tax.⁷ These states fundamentally use a paper-based reporting system to collect the data for calculation of a weight-mile tax, including not only self-reported miles-traveled but also distributed axle-weight and vehicle configuration (i.e., tractor and number and type of trailers). Oregon's weight-mile tax

⁷ The states collecting weight-miles taxes are Oregon, New Mexico, Kentucky and New York.

program allows submission of electronic data handled by EROAD, a private player certified by the government that performs similar functions for heavy trucks that WA RUC service providers handled for passenger cars in the pilot.

For enforcement purposes, weight-mile taxation takes advantage of other policies that also manage common-carriers such as weight-limits, safety requirements and driving hours-limits. It is understandable why one government agency would manage all the policies applied to common carriers. In the state of Oregon, which has the most robust weight-mile tax program, the Motor Carrier Transportation Division also regulates common-carriers and enforces laws applied to them.

No state has attempted collection of a RUC, as applied to passenger vehicles, exclusively by a single government agency, even by simulation, in any RUC pilot or program thus far.⁸ ⁹This may be because government agencies tend not to have the initial technical expertise to collect passenger-vehicle RUC or the ability to obtain new personnel for tests. To date, RUC programs in the United States have used advanced technology for mileage reporting. Government agencies are best suited for oversight capabilities rather than maintenance of the cutting-edge knowledge of technologies and businesses systems found in the private sector.

Up to this point, passenger-vehicle RUC has only occurred in small demonstrations and programs or on time-limited tests. Adding a large government staff in such cases may prove impractical for a pilot program or demonstration limited in size or duration. A sizable permanent program may yield a more positive environment for a government-only RUC collection system for passenger vehicles.

3.2 Single private-sector service provider configuration

When a government agency lacks sufficient capacity for collection of a tax—whether inadequate staffing levels, technical capacity or skillsets—the agency may seek a single

⁸ Oregon DOT's Road User Fee Pilot Program (2006-07) and Minnesota DOT's Road Fee Pilot Test (2010-12) both contracted with research entities to conduct their field studies, as delivery partners, rather than the agencies.

⁹ Oregon's OReGO program has a state provided account management option (in addition to the Commercial Account Managers option), called the Oregon Account Manager (OAM) but the state contracts with a single private-sector service provider to provide the stripped-down service (i.e., no location-aware device and no value-added services) offered by the state. The state of Oregon does not provide mileage data collection, invoice preparation and RUC account management through its own personnel.

private-sector provider for the necessary services (configuration 2). A government may seek a single private-sector provider for a RUC pilot or an initial RUC system with the intention of moving to an open market for private-sector providers later (see configurations 3 and 4 below).

Through the procurement process, the agency can assure the availability of the necessary personnel, expertise and systems by contracting with a private-sector entity. The agency's responsibilities lessen to oversight and some elements of enforcement.

For passenger-vehicle RUC collection systems, government agencies have procured single private-sector service providers for small, per-mile charge demonstrations in Colorado and the I-95 Corridor Coalition.¹⁰ In Colorado, the government agency procured and contracted the private-sector service provider as part of a delivery team to provide all the services necessary for collection of RUC from a set of volunteer payers recruited by the agency. Given the operational time constraint of only a few months, the agency contracted with the team's delivery partner, an independent consulting firm, to provide oversight. Since the RUC payers were volunteers, enforcement functions were not fully implemented.

As a private entity with a number of government agency members, the I-95 Corridor Coalition procured a private-sector delivery partner to assist with selection of a private-sector service provider for providing the technical aspects of mileage reporting and account management. The coalition's delivery partner provided oversight. The RUC payers were volunteers, making full enforcement functionality unnecessary.

3.3 Open market private-sector service providers configuration

An alternative to a single private-sector provider, this configuration establishes an open private-sector market for RUC services. An open market aims to achieve viable and continual competition among service providers. The agency may procure a set number of providers or allow every qualifying provider to participate. A private-sector provider

¹⁰ Both the Colorado RUC demonstration and the I-95 Corridor Coalition demonstration occurred over several months in 2018. While technically the I-95 Corridor Coalition is not a governmental entity, the coalition represents members comprising transportation-related government agencies.

qualifies for participation in the open market by proving its capability to meet the standards through a certification process.

Under configuration 3, the government agency establishes standards for qualifying private-sector entities to meet and follow. These standards take the form of technical documents¹¹ and contractual agreements with the providers. These standards set forth the performance requirements necessary for system functions and oversight parameters and the qualifying providers are contractually required to adhere to them.

The only government agency in the United States that has come close to procuring an open market of private-sector service providers for an operational passenger-vehicle RUC system is the Oregon Department of Transportation (ODOT) for its OReGO program.¹² In 2015, ODOT contracted with four private-sector service providers to provide collection services for Oregon's recently enacted RUC program for passenger vehicles. ODOT negotiated a market contract signed by each service provider. Only three of these entities successfully completed the certification process to become *Commercial Account Managers* (CAMs) authorized to collect mileage data and road usage charges for Oregon's operational RUC program.¹³ At this point, the service providers authorized to provide services for the OReGO program is limited to the originally procured and certified service providers. ODOT has indicated an intention, however, to open the market to all qualified comers at some point.¹⁴

Extensive RUC pilot programs for passenger vehicles in California and Washington procured multiple private-sector service providers.¹⁵ In both cases, a government agency procured a single delivery partner, rather than delivering the pilots through the agency itself. The delivery partner, in turn, procured and managed the service providers at one time, before the start of the pilot, with no subsequent opportunity for further entrants. Nevertheless, the private providers competed for market share during the pilot programs, simulating most of the salient aspects of an open market system to motorists.

¹¹ The technical documents consist of an Interface Control Document, Systems Requirement Specifications and Business Rules adopted by the agency. They may also include a Service Level Agreement.

¹² <http://www.myorego.org/>

¹³ One of the CAMs has since dropped out of the program, leaving only two CAMs remaining.

¹⁴ Conversation with Maureen Bock, manager of the ODOT Office of Innovation, Spring 2018.

¹⁵ The California Road Charge Pilot Program of 5,000 volunteers operated from June 2016 to March 2017. The Washington Road Usage Charge Pilot program of 2,000 volunteers operated from February 1, 2018 to January 31, 2019.

3.4 Combination of government agency and open market private-sector service providers configuration

For various reasons, a government agency may seek a combination of agency provision and private-sector provision of RUC services. A government may prefer, for example, to take advantage of competition among the private-sector service providers providing technology-based mileage reporting methods to reduce costs and promote technological innovation. The government may find, on the other hand, that manual reporting take place under the agency banner. For purpose of this paper, *Configuration 4* means a combination of government agency-only delivery and an open market for private-sector service providers.

In addition to the market-based approach for commercial account managers (CAMs) for OReGO, ODOT also procured one private-sector entity to exclusively provide the government option, referred to as the Oregon Account Manager (OAM). The CAMs and the OAM have different functions. The CAMs may offer location-based mileage reporting and value-added services and seek the permission of payers to use their personally identifiable information. Value-added services include add-on commercial features such as drive scoring, “find my car,” and other enhancements. The OAM may only offer non-location aware mileage reporting and cannot offer value-added services nor seek the use of personally identifiable information, as befits a government agency. ODOT provides these two options to offer participating volunteers clear choices for account management.

For the California Road Charge Pilot Program, the state contracted for their delivery partner to provide a combined configuration similar to OReGO.¹⁶ The WA RUC pilot did not feature a government procured collection option.

For an operational RUC program, the state of Washington may use an open market for private-sector provision of technology-based mileage reporting while using the Department of Licensing for providing one or more manual methods for data collection. The private-sector service providers could also offer value-added services, but DOL would not.

¹⁶ The California Road Charge Pilot Program referred to the government option as the State Account Manager (SAM).

3.5 Combination of government agency and single private-sector service provider configurations

Configuration 5 entails a combination of a government agency-only delivery with a single private-sector service provider under either a proprietary closed system (configuration 5a) or under a nonproprietary open system (configuration 5b). These two configurations may emerge from a desire for a government agency to provide manual mileage reporting methods and a private-sector entity to provide automatic mileage reporting methods. While an open system would more easily allow for a competitive re-procurement (configuration 5a), a closed system is another possible option (configuration 5b).

3.6 Summary of the Configurations

The following table provides an overview of the five configurations presented in this chapter.

Table 3-1: Overview of the five delivery configurations for collection functions in a RUC System

Configurations	RUC System Delivery Description
Configuration 1	Government agency-only delivery
Configuration 2	Single private-sector services provider delivery
Configuration 3	Open market private-sector services provider delivery
Configuration 4	Combination of government agency-only delivery and open market for private-sector provider delivery
Configuration 5a*	Combination of government agency delivery and single private-sector provider delivery under a closed system
Configuration 5b*	Combination of government agency delivery and single private-sector provider delivery under an open system

4 Assessment Criteria for RUC Delivery Configurations in a Final End State Program

This chapter determines the criteria for assessing the RUC collection configurations described in chapter 3. In making this determination, chapter 4 draws from the 13 Guiding Principles for RUC as set by the Washington RUC Steering Committee and the selection criteria for the federal FAST Act section 6020 grant program. This chapter also identifies additional criteria that should prove helpful in the assessment.

4.1 Washington's 13 Guiding Principles as assessment criteria

During the RUC development phase, the Washington Road Usage Charge Steering Committee established one goal and recommended 13 Guiding Principles for business case evaluation of road usage charging concepts.¹⁷ The goal was to identify and develop a sustainable, long-term revenue source for Washington State's transportation system to transition from the current fuel excise tax system. The 13 Guiding Principles indicate how the state should implement the goal and provide a basis for assessing the pros and cons of the five configurations for collection of a road usage charge.

Similar to 13 Guiding Principles, selection criteria developed for the FAST Act section 6020 federal program provide further nuanced guidance for assessing the five most likely configurations for a road usage charge. These federal criteria are: public acceptance, congestion mitigation (if appropriate), cost of system administration, income equity, geographic equity, urban vs. rural equity, protection of personal privacy, reliability and security of technology, ease of compliance, implementation, auditing and enforcement, use of independent third-party vendors, flexibility and user choice, and interoperability. These federal criteria align well, in succession, with the 13 Guiding Principles set forth in the following table.

¹⁷ Washington State Road Usage Charge Assessment Final Report (FY 2014)

Table 4-1: WA RUC Steering Committee’s 13 Guiding Principles

No.	Guiding Principle	Objective
1.	Transparency	A road usage charge system should provide transparency in how the transportation system is paid for.
2.	Complimentary policy objectives	A road usage charge system should, to the extent possible, be aligned with Washington’s energy, environmental, and congestion management goals.
3.	Cost-effectiveness	The administration of a road usage charge system should be cost-effective and cost efficient.
4.	Equity	All road users should pay a fair share with a road usage charge.
5.	Privacy	A road usage charge system should respect an individual’s right to privacy.
6.	Data security	A road usage charge system should meet applicable standards for data security, and access to data should be restricted to authorized people.
7.	Simplicity	A road usage charge system should be simple, convenient, transparent to the user, and compliance should not create an undue burden.
8.	Accountability	A road usage charge system should have clear assignment of responsibility and oversight, and provide accurate reporting of usage and distribution of revenue collected.
9.	Enforcement	A road usage charge system should be costly to evade and easy to enforce.
10.	System Flexibility	A road usage charge system should be adaptive, open to competing vendors, and able to evolve over time.
11.	User Options	Consumer choice should be considered whenever possible.
12.	Interoperability and Cooperation	A Washington RUC system should strive for interoperability with systems in other states, nationally and internationally, as well as with other systems in Washington. Washington should proactively cooperate and collaborate with other entities that are also investigating road usage charges.
13.	Phasing	Phasing should be considered in the deployment of a road usage charge system.

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¹⁸ This paper places phasing apart from the other criteria to consider this complex and impactful topic on its own in chapter 6.

4.2 Additional principles not considered assessment criteria

In its final report for FY 2014, the Washington Road Usage Charge Steering Committee considered adding the following two *possible principles* to the list of 13 guiding principles, but stopped short of doing so:

Distinguishing between travel on Washington public roads and other roads, and
Payment of RUC by non-resident drivers.

This paper does not add these two *left-out* principles to the delivery assessment criteria. *Distinguishing road type* is a technical issue not having much bearing on delivery of a RUC system, except to note that, as a practical and technical matter, manual collection of mileage data could never have this capability. Requiring *RUC payment by non-resident drivers* is a separate policy question, with its own distinct challenges, that could impact selection of RUC delivery but until the legislature authorizes this, frankly, far-in-the-future, difficult-to-implement policy, it is not warranted to add such a criterion to assessment of RUC delivery configurations. Furthermore, even the WA RUC pilot participants regarded the out-of-state driver question as the least important of nine RUC principles surveyed.¹⁹

4.3 Additional considerations for assessment criteria

The following eleven additional considerations should inform assessment criteria for the five configurations for collection in a RUC system.

- ▶ Ease of administration
- ▶ Risk of delivery
- ▶ Provider responsiveness to payer needs and requests
- ▶ Provider resolution of payer issues
- ▶ Capability of communications and customer support
- ▶ Ability to audit the provider (among the federal FAST Act criteria)
- ▶ Ability to detect tampering and fraud
- ▶ Reliability of technologies (among the federal FAST Act criteria)
- ▶ Open system (among the federal FAST Act criteria)
- ▶ Ability to coordinate with a local tolling system

¹⁹ *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 13, p. 37.

- ▶ Practical availability, including risk of delivery, resources, technological and business system, enabling system affordability²⁰ and continuity²¹

Although perhaps not essential for determining the viability of a road usage charge, these additional considerations prove helpful in discernment of one or more recommended delivery configurations for a road usage charge system.

4.4 Categories for assessment criteria

The various principles, criteria and considerations for assessing configurations of a RUC system can be grouped into six categories:

- ▶ Administrative effectiveness,
- ▶ Participant experience,
- ▶ Operational performance,
- ▶ Practical availability,
- ▶ Flexibility, and
- ▶ Policy alignment.

This paper uses these six categories to orient assessment of each of the five most likely RUC system configurations.

²⁰ This paper examines *affordability* in the context of whether a particular delivery configuration enables the RUC program to reduce overall costs and grow to a size when the net revenues can support the highway system as well or better than the gas tax. This paper examines *cost effectiveness*, by contrast, from the standpoint of how well one delivery configuration compares with the other delivery configurations from a cost perspective.

²¹ *Practical availability* means whether a configuration is readily available given practical considerations, as opposed to *theoretical availability* which means a configuration is available under certain theories or concepts rather than practicalities.

Table 4-2: Categories and corresponding criteria and type of issues

Category	Criteria	Type of Issue
Administrative effectiveness	<ul style="list-style-type: none"> • Ease of administration • Accountability and oversight • Cost-effective and cost-efficient 	Operational issues
Participant experience	<ul style="list-style-type: none"> • Simplicity, convenience, ease of use, minimally burdensome compliance • Transparency of access • Responsiveness • Issue resolution • Communications and customer service 	Operational issues
Operational performance	<ul style="list-style-type: none"> • Technologies <ul style="list-style-type: none"> ○ System alignment ○ Accuracy and reliability ○ Availability of user choice • System integrity <ul style="list-style-type: none"> ○ Privacy ○ Data security ○ Easy to enforce ○ Costly to evade ○ Ability to detect tampering or fraud ○ Ability to audit • System alignment <ul style="list-style-type: none"> ○ Coordination with tolling system ○ Interoperability with other jurisdictions 	Operational issues
Practical availability	<ul style="list-style-type: none"> • Risk of Delivery • Resources • Technological and business system capabilities • Affordability • Continuity 	Practical issues
Flexibility	<ul style="list-style-type: none"> • Open to competing vendors (open system) • Adaptability for policy changes • Ability to innovate and evolve technology and business systems • Scalability 	Design issues
Policy Alignment	<ul style="list-style-type: none"> • Transparency of system • User pay system • Alignment with state's energy, environmental and congestion management goals • Fairness and equity 	Design issues

5 Application of Assessment Criteria to RUC Delivery Configurations for a Final End State program

Chapter 5 applies the assessment criteria developed in chapter 4 to the RUC delivery configurations identified in chapter 3. The purpose of this chapter is to identify the most appropriate configurations for delivery of a RUC program in a fully mature, final end state and corresponding policies likely to affect selection of the actual configuration for delivery of RUC in the state of Washington. **In other words, the assessment in this chapter intends to suggest answers to the question, “What is the best delivery mechanism for a RUC program after government has refined its oversight and administrative systems and RUC is broadly mandated for all, or substantially all, new passenger vehicles?”**

5.1 Assessment of five configurations for RUC delivery

The assessment results for the five most likely configurations for delivery of a RUC system are contained in Table 5-1. A more detailed assessment of the configurations can be perused in Appendix A.

Key:

Indication	Meaning
	Poor/ Does not support
	Fair / Partially Supports
	Good / Mostly Supports
	Excellent / Fully Supports
	Equal/ No difference

Table 5-1: Harvey Ball Assessment of five configurations for RUC delivery

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Administrative effectiveness					
• Ease of administration					
• Accountability and oversight					
• Cost-effective and cost-efficient					
Participant experience					
• Simplicity, convenience, ease					
• Transparency of access					
• Responsiveness					
• Issue resolution					
• Capability of communications					
Operational performance					
• Technologies					
□ System alignment					
□ Accuracy and reliability		 for automatic	 for automatic	 for automatic	 for automatic
□ User choice			 for automatic	 for manual and automatic	
• System integrity					
□ Privacy				 if open	
□ Data security					
□ Easy to enforce					
□ Costly to evade					
□ Detection of tampering and fraud					
□ Ability to audit					

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
<ul style="list-style-type: none"> System cooperation <ul style="list-style-type: none"> With toll system <ul style="list-style-type: none"> For coordination For integration For integration For coordination Interoperability 					
Practical availability					
<ul style="list-style-type: none"> Risk of delivery Resources Technology & business system Enabling System Affordability Continuity 					
Flexibility					
<ul style="list-style-type: none"> Open to competing vendors Adaptability for policy changes Ability to innovate and evolve Scalability 					
Policy Alignment					
<ul style="list-style-type: none"> Transparency of system User pay system Alignment with state's other policy goals Fairness and equity 					

Assessment of the five most likely configurations for delivery of a RUC program in a fully mature, final end state reveals that an open system for multiple private-sector service providers (configuration 3) yields the best overall results in the operational categories of administrative effectiveness, participant experience and operational performance. An open market for multiple firms meets criteria for ease of administration, cost-efficiency

and cost-effectiveness²², convenience, and abilities to produce technologies appropriate for a RUC system and protect privacy. In the design category of flexibility, the open market allows for competing vendors and abilities to innovate and evolve technologies and systems. The open system is also easily scalable.

The combination of an open market for multiple providers with government agency provision (configuration 4) produces similar positive results for criteria in the operational performance, participant experience and the flexibility categories. The open market/government agency combination produces less certainty, however, in assuring practical availability for minimizing delivery risk. The possibility for administrative effectiveness (ease of administration and cost-efficiency) for the open market/government combination will depend upon the structure of the combination.

Assessment of government agency-only delivery (configuration 1) shows positive results in the practical availability category with the lowest risk of delivery and the best chance for continuity over the other configurations. Government agency-only delivery has severe challenges, however, in the flexibility category, struggling with criteria for openness to competing vendors, ability to innovate and scalability. Government delivery also struggles with the operational performance and participant experience categories. In the transportation sector, chronically-delayed staffing levels and under-funded capital costs for modernizing government IT infrastructure often challenge government to adequately deliver customer services and user-friendly technologies. For a RUC program, this will also mean difficulty for government to provide an attractive assortment of mileage reporting options beyond manual methods.

The single private-sector service provider delivery method (configuration 2) has severe challenges. Although single provider delivery appears easier, faster and less expensive at the start, configuration 2 removes continuous competition—and therefore eliminates downward pressure for cost-efficiencies—once the RUC program becomes permanently

²² The open market becomes cost-effective once a RUC program reaches a viable number of participants. At the introductory levels, an open market for a RUC program will be challenged to generate positive net revenue. Configurations 3 and 4 will not take advantage of competition until the number of vehicles reaches 50,000 to 100,000.

operational.²³ With a contract in-hand, the single provider's practical availability and participant experience weakens as the firm has little reason to improve technologies, business systems, cost-effectiveness, system affordability or customer service. A single provider is not strong in the flexibility category either, as the sole contracted entity will, by definition, not be subject to competition, and may have little financial motivation to innovate, scale or engage in transition planning. A good example is the telecommunications monopoly of AT&T. There is no question that the AT&T phone service worked well but prior to the court consent order issued in 1982, AT&T's services to the public were very slow to innovate; the phone attached to the wall and there was only standard phone service and equipment and nothing more. After the AT&T breakup, the seven spinoff companies began to offer new services to businesses and households, leading to a cellular network, wireless handheld phones and the Internet in the first decade. Now we have handheld computers (smartphones) worldwide, wireless data streaming and free phone conferences with people situated in multiple places on the globe as the same time. It's hard to imagine telecommunications now without the expectation of perpetual innovation. The pre-1984 AT&T may have accomplished some of this but likely at a glacial pace because the company had no competition. Competition among telecommunications companies quickened innovation applications.

The combinations for a single private-sector service provider with a government agency (configurations 5a and 5b) are completely impractical as a final end state. Each combination has the weaknesses of single private-sector provider delivery while weakening the strengths of government agency-only configuration. Of the two combinations, however, configuration 5b is preferable due to a better assessment of the delivery risk and continuity criteria. As an open system, the authorized government agency could transfer the RUC system under configuration 5b to a new entity, albeit not necessarily swiftly, should the agency discover a business reason to do so.

²³ A RUC system becomes *permanently operational* when it performs all the functions necessary for RUC collection and does not have a termination date.

6 RUC Transition Pathways to a Final End State Program

6.1 The basis for a transition strategy

A RUC program will almost certainly not start with a fully mature, permanent, operational system in its final end state. Rather than undertake the risky proposition of mandating RUC for a substantial portion of the vehicle fleet, a wiser strategy suggests beginning with an initial, short-term configuration by adding vehicles into the program in increments over time. In this way, the general driving public familiarizes itself with the RUC program in small bites as the RUC system expands into complete coverage over a number of years. This transitional phasing approach could either occur over a planned period or as political opportunities emerge. The most favored approach of the WA RUC participants for implementing a RUC system statewide is for a gradual phase in over five to ten years to eventually replace the gas tax.²⁴

A transition strategy should lay out, in advance, the final end state to which the program aspires in order to assure that the steps taken in transition lead to the aspiration rather than to a dead end. A strategy for expansion from a small initial RUC program to a full road usage charge program over time would identify which passenger vehicle segments would enter the program and when.

This chapter suggests a potential transition pathway for each of the three final end state delivery configurations recommended in chapter 5. These recommended final end state configuration possibilities are:

- ▶ Government-only delivery (configuration 1);
- ▶ Open commercial market of private-sector service providers (configuration 3); and

²⁴ 33% of WA RUC pilot program participants favored a gradual phase in of a RUC system over five to ten years to eventually replace the gas tax. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 23, p. 41.

- ▶ Combination of government and private-sector open market (configuration 4).

6.2 Potential transition pathways for RUC delivery configurations

To transition a RUC program from policy enactment to a fully mature, final end state, the early stages of RUC delivery must enable movement from one phase through others, while continuing operations with minimal difficulty, until completion of the entire journey from an initial, small-scale, introductory program to the ultimate program. This could take a number of years, possibly even a decade or two, depending upon how quickly policymakers add new vehicle segments to the RUC program.

There are four relevant transition pathways for a RUC program to achieve its final end state.

6.2.1 Government start pathway (transition pathway 1).

RUC delivery starts with a government agency providing whatever data gathering, invoicing and account management is preferred or necessary. This transition pathway is similar to configuration 1.

6.2.2 Single, private-sector service provider with open system pathway (transition pathway 2).

For the initial stages of a RUC program, the government procures a single, private-sector service provider for a limited duration under an open system adopted by the government.

6.2.3 Single entrant in an open commercial market for multiple, private-sector service providers pathway (transition pathway 3).

RUC delivery starts with an open commercial market operating under performance criteria and standards for an open system set by the government but does not open the market for competition. Rather, the government establishes performance criteria and standards for an open system, a provider certification process and a market contract for an open market. Then, prior to opening up the market, the government procures a single, private-sector service provider that qualifies under the certification requirements under the market contract as the first provider under the open commercial market. Once the new RUC system begins to operate smoothly and sufficient RUC payers have entered

the program for meaningful competition, the government opens up the open commercial market to other certified providers.

6.2.4 Combination of government agency and single, private-sector service provider pathway (transition pathway 4).

RUC delivery starts with a combination of government agency and single private-sector service provider (transition pathway 4) under either an open system general in nature (4a), or an open system specific to the same open system performance standards that will be required for an open commercial market (4b) ²⁵ leading to transition to the final end state at a later time.

6.3 Additional criteria for assessment of transition pathways

While still relevant in transition, assessing the transition pathways for final end state delivery configurations must go beyond the assessment criteria laid out in table 4-2 to consider additional criteria.²⁶ The four additional criteria critical to assessment of transition pathways are as follows:²⁷

- ▶ Foundational (to the ultimate delivery configuration).

Strategically, the transition pathway should take steps toward, and indeed, lead to the ultimate end state program. Transition pathways that are foundational to the ultimate RUC system will enable quicker procurements, make movement from phase to phase less difficult, less expensive, and less confusing for the motoring public, and build institutional knowledge within the oversight agency and any private-sector service providers.

²⁵ Note that the combination of government agency and single, private-sector service provider under a closed system, although theoretically a transition pathway, is not viable as a foundation for transition to any of the recommended final end state delivery configurations.

²⁶ Note that this paper assumes that procurement of each transition pathway will ensure functionality for the program characteristics and transition capabilities. As such, functionality is not considered in this paper as a criterion for discernment of transition pathways.

²⁷ It must be noted that an additional factor may strongly influence the selection of a transitional pathway: political viability. This paper does not have sufficient information to evaluate political viability. Indeed, political viability is too fluid and elusive for evaluation as enduring consideration anyway.

- ▶ Adaptable (from phase to phase).

Whether a transition pathway will have the ability to adapt from phase to phase will depend on design. Any delivery method using a closed, proprietary system loses flexibility, so any closed system pathway would require, before commencement, consideration of an entire transition plan, without any changes, over the transition period. Delivery configurations using an open system will maintain flexibility to accommodate alterations to a transition plan over the transition period or even a transition that is fluid.

- ▶ Timely (quickly available for each phase of implementation).

Whether a transition pathway is timely will depend upon whether the prescribed entity has access to adequate staffing, resources and technical expertise to enable quick adjustments as conditions require. As policymakers add vehicle segments to the program, the former level of resources will be challenged to meet the new obligations without an ability to keep staffing, resources and expertise current. Timeliness will also depend upon the ability of the government to provide speedy procurement of outside resources.

- ▶ Ease of implementation.

Whether a transition pathway is easy to implement depends upon the relative complexity of obtaining and accessing the necessary resources and expertise to enable functionality of the program.

6.4 Assessment of transition pathways to ultimate RUC system

This section applies the additional assessment criteria developed in section 6.3 to the transition pathways identified in section 6.2. The purpose of this section is to identify the most appropriate transition pathways for each viable RUC delivery configuration in its final end state.

Assessment of the four transition pathways to a final end state for a RUC program reveals that the best transition pathway depends upon the preferred RUC delivery

configuration identified in chapter 5. The transition pathway question for each delivery configuration yields a different answer.

For government-only delivery (configuration 1), the best transition pathway is procurement of *a single, private-sector service provider for a limited duration (transition pathway 2) operating under an open system adopted by the government*. Although not foundational to the final end state of government operations, a single private-sector service provider offers the greatest certainty and simplicity, and allows transferability to the ultimate government-operated RUC system. The single service provider would enroll RUC participants, provide mileage reporting technologies or services, collect mileage data and manage invoicing and RUC payer accounts. The transition may occur once the government feels properly resourced.

A single service provider may wish to apply its own proprietary system rather than adhering to requirements of an open system adopted by the government. While accessing a closed system provides certainty about how the system operates, the proprietary closed system often ties a program to its provider for a lengthy period of time, if not for entire term of the program. Shifting from a proprietary closed system to entirely government administration could prove problematic and expensive. Requiring that the single provider use an open system performance criteria and standards adopted by the government will remove these challenges.

For the configuration of an open commercial market for multiple service providers (configuration 3), the best transition pathway is *a single, private-sector service provider as the first entrant into an open commercial market with open system performance standards adopted at the beginning of the program (transition pathway 3)*. The government could simply go straight-away to the open commercial market rather than this transition pathway but if the government has concerns about putting together such a complex arrangement from the outset or is unwilling to accept the risk of engaging and managing multiple providers in an introductory program, procuring a single, private-sector service provider to operate under an open system (transition pathway 2) could aid the transition.

While, for this pathway, the government must adopt open system performance criteria and standards amenable to an open commercial market, examples of these standards already exist for RUC. The Oregon DOT's OReGO program started with the essentials of an open commercial market for its 2015 launch, creating technical documents,²⁸ a certification process and a market contract. The California Road Charge Pilot Program and the Washington Road Usage Charge Pilot Project used similar open system requirements, updating many of OReGO the technical documents.

Transition pathway 3 would lead to an easy transition to an open commercial market, better meeting the criteria for foundation, adaptability, ease of implementation and timeliness than any other transition pathway.²⁹ As the first entrant into an open market, a single provider could simplify the work of a single state government by removing or reducing the procurement and oversight responsibilities of regulating an open market and managing multiple private-sector providers.

For the configuration for *combination of government agency and private-sector open market* (configuration 4), the best transition pathway is a combination of government agency and procurement of a single, private-sector service provider as the first entrant into an open commercial market with the same open system performance standards as the ultimate open commercial market (transition pathway 4). The other transition pathways will prove cumbersome because there will be more complexities and risk by either adding the government functions or adopting the specific open system performance standards required for an open commercial market at a later time.

²⁸ The technical documents for the open system performance criteria and standards include an interface control document, system requirements specifications and business rules.

²⁹ Utah DOT, the second state to enact an operational RUC program, intends to use this transition pathway, implementing the initial stage of the program by procuring and contracting with a single private-sector service provider then transitioning to an open commercial market later. Given the fast pace from enactment to implementation mandated by legislation, the desire to minimize additional bureaucracy, and the relatively small scale of the initial program, Utah deemed this approach most practical.

Table 6-1: Optimal Transition Pathways for Final End State Configurations

Final End State Configuration Preference	Optimal Transition Pathway
Government-only delivery (Config 1)	Single private sector provider operating under open system adopted by government (Transition pathway 2)
Open commercial market for multiple private-sector providers (Config 3)	Single entrant into open commercial market with open system adopted at beginning (Transition pathway 3)
Combination of government and open market for multiple private-sector providers (Config 4)	Combination of government agency and single entrant into open commercial market for multiple private-sector providers (Transition pathway 4)

7 Legal Elements for Third Parties to Collect RUC in Washington

This chapter identifies legal elements required for the state of Washington to enable third parties to act on behalf of the state to collect mileage data and a road usage charge. Although this chapter was drafted and reviewed by lawyers, this chapter is not intended to provide specific legal advice to the state of Washington. The state should obtain legal advice and representation from its lawyers in the Office of the Attorney General of Washington for specific legal advice pertaining to legislation and rulemaking for any part of a RUC system or program.

7.1 Authority elements

The authorizing legislation for a RUC program should grant authority to a government agency to develop, procure, administer, operate, and enforce the program. Should the legislature desire that the RUC program go beyond traditional government delivery or commonly used single private-sector provider delivery to creation of an open market for private-sector service provider competition, the legislation should have provisions defining such a procurement.

Suggested RUC delivery provisions in legislation:

- ▶ The legislation should define the term “open system;”
- ▶ The legislature should confer powers on an agency to implement a RUC program, including the establishment of oversight and audit procedures to ensure the proper reporting, collection and remittance of RUC revenue to the state;
- ▶ The authorized agency should adopt standards for an open system for the RUC program;
- ▶ Special procurement authority to create an open market for private-sector RUC service providers to collect metered mileage data and a road usage charge and engage in RUC account management on behalf of the state of Washington.

7.2 State Treasury policy coordination

The Office of the State Treasurer (or in some cases, the Department of Revenue) establishes policies for management of tax revenue. These policies may include requirements for how private-sector entities must handle the revenue and time-limits for forwarding revenue raised to the Treasurer. At a minimum, the Treasurer's Office and the Department of Revenue should be actively involved in creating a legal, accountable and efficient revenue collection and remission process.

8 Conclusion

Selection of the delivery mechanism for a RUC system may seem like lower priority decision-making. Policymakers should regard delivery of the RUC system, however, as essential to success of the policy implementation. Selection of the appropriate delivery configuration for a RUC system can lead to reduced cost, less risk, and better system applications. The delivery configuration will also aid in identifying critical areas for management focus.

While the 32 assessment criteria do not have equal value, this paper does not weigh the relative importance of the criteria, leaving that judgment for the reader. For example, one reader may regard the *risk of delivery* as the most important criterion and dismiss all other criteria as less essential for selection of the delivery mechanism. Another reader may view risk as something that the RUC program management can effectively manage, placing greater importance on *reduced cost of delivery*. The relative weight applied to each of the 32 criteria by the reader may yield widely different results.

In fact, this paper identifies just such a variation among the five delivery configurations. Government agency-only delivery of RUC (configuration 1) indeed has less risk and assures greater continuity. On the other hand, an open market for private-sector service providers (configuration 3) will take advantage of cost efficiencies as the scale of a RUC program rises while, at the same time, aptly applying innovative technologies and business systems.

A reader's preference for mileage reporting methods will affect selection. If the RUC system will use only manual methods for mileage reporting, then a government agency-only delivery should have preference. If the RUC system will only use automated methods for reporting, then one of the private-sector configurations should be chosen; furthermore, the availability of up-to-date user choices would indicate preference for an open market for private-sector providers (configuration 3). If the RUC system will use both manual and automated mileage reporting methods, then a combination of government and a private-sector open market (configuration 4) yields the best result.

Rarely will a single, private-sector provider delivery (configuration 2) rate a favorable assessment for delivery of a fully mature, permanent, operational RUC system³⁰ that is in its final end state. As discussed in Appendix A, single, private-sector service provider delivery (configuration 2), in a final end state, lacks the advantage of competition to achieve innovation, create cost efficiencies and reduce the delivery risk, among other disadvantages. There may be an exception for single provider delivery when the overseeing government agency establishes an open system with plans to open up the program to a competitive open market at a later stage.

Procurement of a single private-sector provider may seem, at first glance, like the best alternative to government provision of a government program, largely because single provider procurements are common in government. At the beginning, single provider delivery appears easier, faster, less risky, and less expensive. There is no need to develop standards and a certification process. The single provider can deploy its proprietary system easily and quickly. The single provider requires minimal oversight. Expensive change orders and design constraints do not come until later. While it is true a RUC system would bear the fruits of competition during the procurement stage, the RUC system under a long-term, single provider will not have the advantage of competition during system operations. Moreover, the exclusion of prospective new entrants from the market during the period of operation of a single private provider reduces the ability of other firms to learn, innovate, evolve approaches, reduce costs, and compete at competitive moments against incumbent providers. The opportunity for competition does re-occur until the single private provider's contract term ends and the government re-procures the services.

Despite its initial appeal, a single private-sector provider has a far less positive assessment than an open market of multiple private providers and also lacks a government agency's advantages of low risk and continuity. More distressing, unless the government procures for an open system, the embedding of a proprietary system into the RUC program may mean the single provider's system may not be removable, except at great cost and risk, leaving the state stuck with one, almost certainly inflexible, provider for the entire duration of program operations. Whatever the initial appeal of procurement

³⁰ A *permanent operational RUC system* is one that performs all the functions necessary for RUC collection and does not have a termination date.

of a single private-sector provider, establishing an open market for multiple private-sector providers has far greater advantages in terms of cost, risk, and flexibility for system operations.

In summary, government-only delivery (configuration 1) is not desirable to enable provision of a range of technology options. Single private-sector provider delivery (configuration 2) has no advantages in a final end state, except perhaps in transition to a fully mature program by temporarily providing technology options and account management services requiring technical expertise in a RUC program's initial stages. An open market for multiple private-sector service providers (configuration 3) is best for a large RUC system. An open market combined with government provision of an additional service option (configuration 4) will also be desirable for a large system with an ability to mix manual reporting options with automated reporting options.

While it is possible for a RUC system to begin at its final end state, the likelihood is low. Rather, the RUC system will start with a transition pathway that leads to a preferred delivery configuration. The optimal transition pathway differs depending upon the recommended final end state delivery configuration under consideration.

- ▶ For *government-only delivery* (configuration 1), the optimal pathway would be a single, private-sector service provider for a limited duration operating under an open system adopted by the government. (transition pathway 2).
- ▶ For *open commercial market for multiple private-sector providers delivery* (configuration 3), the optimal pathway would be a single, private-sector service provider as the first entrant into an open commercial market with open system performance standards adopted at the beginning of the program (transition pathway 3).
- ▶ For *combination of government agency and open market for multiple service providers delivery* (configuration 4), the optimal pathway would be starting with a combination of government agency and procurement of a single, private-sector service provider as the first entrant into an open commercial market with the same open system performance standards as the ultimate open commercial market (transition pathway 4).

Appendix A: Application of assessment Criteria to RUC Delivery Configurations

This Appendix applies the assessment criteria developed in chapter 4 to the RUC delivery configurations identified in chapter 3. The purpose is to identify the most appropriate configurations for delivery of a RUC program that is fully mature in a final end state and the policies which will likely affect selection of the actual configuration for delivery of RUC in the state of Washington.

As described in chapter 4, the various criteria for assessing configurations of a RUC system can be grouped into six categories:

- ▶ Administrative effectiveness,
- ▶ Participant experience,
- ▶ Operational performance,
- ▶ Practical availability,
- ▶ Flexibility, and
- ▶ Policy alignment.

This assessment of the five most likely configurations is divided into six sections for each of the six categories of criteria. Each section starts with a chart of the category and associated criteria used in the assessment. Each section ends with a chart comprising the results of the assessment for that category.

I. Administrative effectiveness

Table A-1: Administrative Effectiveness Criteria

Category	Criteria	Type of Issue
Administrative effectiveness	<ul style="list-style-type: none"> • Ease of administration • Accountability and oversight • Cost-effective and cost-efficient 	Operational issues

a. Ease of administration

Taking on RUC—the complex systems and additional resources required for a government to create a new account-based payment system from scratch to manage potentially millions of new payers—may seem a daunting endeavor for a state government. The intensity of this assignment will seem all the more daunting should the government entity assigned the authority to develop, administer, and operate the system have no experience managing taxpayer accounts. The implementation alone, let alone operations, will require acquisition of skillsets and talent rarely needed for other purposes. Preparation and operation of pilots can assist with acquisitions of skillsets and talent within a government agency but whether this occurs will largely depend upon configuration of pilot delivery, or, in other words, the extent to which the government agency involves itself in actual preparation and operations.

Should the assigned agency already have experience and systems related to account management (configuration 1), such as a state DMV or the Washington Department of Licensing, that familiarity has the advantage of not needing a culture-shift. What DOL may find unfamiliar and potentially difficult is managing the technologies and data necessary for account management in a RUC program.

The recent account management activities conducted in RUC demonstrations, pilots and an operational program show that private-sector entities can ably handle account-management, mileage-reporting technologies and data management for a per-mile charge program.³¹ Several private-sector entities have shown these abilities. Therefore, a single private service provider (configuration 2) or an open commercial market of private service providers (configuration 3) could provide a RUC system. Adding a government role to the private-sector role (configurations 4 and 5) would not necessarily make administration that much more complex.

³¹ “Although OReGO’s revenue-generating potential is constrained by the number of volunteers participating, the program provides ODOT and AMs [account managers] the opportunity to operate and fine-tune a real program that includes collecting, tracking, and submitting tax dollars. It also provides volunteers with a legitimate RUC experience.” Kathryn Jones, Maureen Bock and the Oregon Department of Transportation, *Oregon’s Road Usage Charge: The OReGO Program Final Report, April 2017*, p. 6 of Executive Summary.

Configuration best suited to address this criterion: A single private-sector provider (configuration 2) or an open market of private-sector providers (configuration 3).

b. Accountability and oversight

A government agency must retain oversight responsibilities under every configuration. Should government employees perform the delivery tasks (configuration 1), the overseeing agency will adopt rules, procedures and protocols to establish appropriate oversight of activities. Should private-sector entities perform delivery tasks (configurations 2, 3, 4 and 5), the overseeing agency will adopt rules and impose service level agreements containing similar procedures and protocols. The primary difference will be that overseeing government employees will have the advantage of day-to-day viewing of activities while overseeing private-sector entities will be remote and based on achievement of performance standards set forth in contracts. Using private-sector entities will shift oversight of day-to-day activities to the private-sector manager who will be obligated to meet performance standards set forth in the service level agreements with the overseeing government agency.³² Oregon's experience with an operational RUC program indicates the overseeing government agency can accomplish appropriate oversight of private-sector service providers. The OReGO private-sector account managers regarded the government agency as properly resourced and managed to oversee private-sector provision of a RUC system.³³

The delivery preference on this criterion may simply be a matter of agency preparation and training and a strict certification process for private-sector providers. The quality of management services will depend on the entities involved.

Configuration best suited to address this criterion: Equal for all configurations.

³² "AMs [account managers] indicate that SLAs [service level agreements] are tough, but fair and effective." Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 7.

³³ "AMs [account managers] agree, based on their experience with the [OReGO] program to date, that ODOT is capable of running a statewide RUC program, and running it well." Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 6. "AMs [account managers] report that ODOT staff have the skills and resources to support both the program and the volunteers. OReGO staff have ... supported operations, and searched for and resolved glitches, According to AMs, OReGO staffing, resources, level of staff involvement, and overall support from ODOT have contributed to program effectiveness." Ibid, p. 6.

c. Cost-effective and cost-efficient

Research conducted for the WA RUC Steering Committee’s business case analysis in 2015 indicates that the most cost-effective method for delivery of a RUC system is the open market private-sector service providers (configuration 3). The business case forecasts that competition in an open market reduces operating costs compared to government agency delivery (configuration 1). Other analyses of cost for a RUC system offer only qualitative rather than quantitative analysis for this criterion.³⁴ The business case revision currently underway may provide a more definitive analysis. A complete answer may only be achieved when a RUC system achieves economies of scale.³⁵ Nevertheless, a competitive, open market for private-sector providers (configuration 3) could take advantage of value-added services to help carry the system’s operational costs such as for invoicing and collection.³⁶ Indeed, some private-sector providers regard RUC as a value-added service for other services already provided.

As the state’s RUC market evolves, the state will be able to take advantage of the lower operating costs of the private-sector providers. Negotiation could achieve lower RUC compensation rates, perhaps down to zero, for full application to all passenger vehicles.

The above observations assume advanced technology approaches to mileage reporting. New Zealand offers an example of fully manual mileage reporting (pre-paid distance permits) with administrative costs less than 5% of revenue, and well below that of any advanced technology based reporting methods under consideration in the U.S. It is noteworthy, however, that only 1% of drivers in the WA RUC pilot opted for pre-paid mileage permits. Post-paid odometer charges, which could be delivered on a fully manual

³⁴ “Quantitative measures could not be developed for this criterion due to lack of useful data. On a qualitative basis, however, all the account managers noted that economies of scale would be available in a statewide scenario. Moreover, in other general discussions with account managers regarding costs, their respective business models appear to be based on ‘millions of vehicles’ included in a road charge system, with the road charge component becoming a ‘value added’ to the other services they provide to customers.” *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-18.

³⁵ “[A]ll account managers [in the California Road Charge Pilot Program] noted that economies of scale could not be achieved through a pilot, but will likely be available in a statewide scenario consisting of millions of users.” *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, pp. 3-4.

³⁶ “[T]he [California road charge] account managers’ respective business models can accommodate a road [usage] charge with the other services and deliver amenities they already provide to customers.” *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, pp. 3-4.

basis through DOL, similar to New Zealand, was more popular, with 29% opting for that approach.

Configurations best suited to address this criterion: A competitive, open market for private-sector providers (configuration 3) could share the cost of RUC provision with value-added services in competition amongst certified providers. A combination of government agency and an open market for private entities (configuration 4) would also take such an advantage but adding government costs would make the configuration less cost-effective and government agencies will not provide commercially attractive value-added services to help carry the costs. A government-only approach (configuration 1) can be cost effective if the state offers only manual reporting of mileage, such as a pre-paid mileage permit or post-paid odometer charge, particularly if these approaches build on existing registration processes. As a monopoly, a single private-sector service provider will rarely prove as cost-effective as the other configurations.

Table A-2: Administrative Effectiveness Assessment

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Administrative effectiveness					
• Ease of administration					
• Accountability and oversight					
• Cost-effective and cost-efficient					

Key:

Indication	Meaning
	Poor/ Does not support
	Fair / Partially Supports
	Good / Mostly Supports
	Excellent / Fully Supports
	Equal/ No difference

II. Participant experience

Table A-3: Participant Experience Criteria

Category	Criteria	Type of Issue
Participant experience	<ul style="list-style-type: none"> • Simplicity, convenience, ease of use, minimally burdensome compliance • Transparency of access • Responsiveness • Issue resolution • Communications and customer service 	Operational issues

a. Simplicity, convenience, ease of use and minimally burdensome compliance

Whether a RUC system is simple, convenient or easy for payers to use will depend upon how the authorizing law and the authorized government agency sets up and operates the system. The manner of delivery for the RUC system could compound complexity or not. The RUC pilots have largely tested private-sector provision, one with government oversight. While there was some confusion in the California pilot about how to choose an account manager,³⁷ the bulk of participants entered easily into the other RUC pilots and found nothing that made RUC system entry or compliance burdensome.^{38 39 40 41} The WA RUC pilot's participants reported satisfaction with the amount of time they spent in participation.⁴² The WA RUC pilot's single sign-on improvement to program entry should

³⁷ "Focus group participants were less clear on how to select an account manager, or even what an account manager was. They did not feel they has a good understanding of the differences between the various account managers when they were faced with the selection upon enrollment ... the concept of account manager perhaps was not as clear as it could have been." *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 48.

³⁸ Over 90% of OReGO volunteers said signing up was simple and that the MRD was easy to install and activate. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 23.

³⁹ Over 75% of OReGO volunteers said statements were clear and accurate but 11% said statements were not clear and accurate. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 21.

⁴⁰ 91% of Colorado Road Usage Charge Pilot Program participants believed that the RUC information was clear and easy to understand. Colorado Road Usage Pilot Program Final Report, December 2017, p. 77.

⁴¹ 77% of WA RUC pilot program participants said the account set-up process was clear and easy to complete and only 9% found it difficult. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 1, Question 13, p. 11. 92% of WA RUC participants said the instructions for using the chosen mileage reporting method were clear and easy to follow. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 2, Question 2, p. 15. 79% of WA RUC pilot program participants said reviewing mileage data was easy and only 7% found it was difficult. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 7, p. 34.

⁴² *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 11, p. 36.

make even easier the operation of an open market for private-sector providers. The lower, yet positive, regard for the ease of entry into the California pilot likely had to do with the availability of numerous mileage reporting options and insufficient explanation of them.⁴³ To resolve any confusion about selection of an account manager and mileage reporting choices, the RUC system could deploy mitigation measures such as a strict certification process, clear communication rules for payers, and a central repository where payers have access to full descriptions of all options and gain help in making choices.

Manual reporting methods proved more cumbersome than automated methods. In the California pilot, the estimated personal costs the participants endured for compliance using manual methods were more than twice as much as for the automated methods.⁴⁴ Furthermore, though not recorded or estimated, the personal time spent on manual methods over automated methods must have been more since manual methods required active, attentive compliance by taking a picture of the odometer and forwarding it to an account manager while automated methods required only passive compliance (except for the smartphone method). Since a government agency will tend to have responsibility for operation of manual methods, the government-only delivery (configuration 1) should be considered more burdensome for most RUC payers than the other delivery methods operating automatic reporting. Even so, some of the older, technologically-challenged RUC payers may find the manual reporting methods less burdensome.⁴⁵

Theoretically, government agencies can provide automatic reporting methods, albeit out-of-date and certainly not on the cutting-edge technologically. Furthermore, government distribution of technologies would be problematic. Rather than provide the in-vehicle technologies directly, the government would likely rely upon a private vendor to maintain an inventory and distribution system. Updating the technologies would only occur during

⁴³ 72% of the California Road Charge Pilot Program participants were satisfied with ease of enrollment; 69% satisfied with time for enrollment; 67% satisfied with enrollment process overall; 66% satisfied with clarity of communications about enrollment; 65% with process of choosing AM; 47% satisfied with getting enrollment questions answered. Less than 10% were unsatisfied with these activities (except 12% unsatisfied with clarity of communications for enrollment). *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-23.

⁴⁴ *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, pp. 2-19, 2-20.

⁴⁵ See the next criterion: *Transparency and Equity of Access*.

periodic, competitive re-procurements with potentially troublesome transitions for thousands and potentially millions of RUC payers.

If policymakers adopted a policy for ensuring *equity of access* for all RUC payers for reporting mileage traveled, the RUC system would take into account technological disparities for required participatory functions among age groups, income groups and geographically remote groups. This may adjust the relative value of manual reporting methods versus automatic reporting methods for this criterion but, on balance, the overwhelming majority of payers would likely prefer automatic over manual reporting for ease of use, especially as demographic changes to society occurs over time. The policy of *equity of access* may be better assessed in the *availability of choice* criterion.⁴⁶

Configurations best suited to address this criterion: Delivery methods primarily supporting automatic reporting (configurations 2, 3, 4, 5). As such, configuration 1 cannot be completely dismissed for this criterion.

b. Transparency of access

Whether a RUC system has *transparency of access* will depend upon how the authorizing law and the authorized government agency sets up and operates the system. The manner of delivery of the RUC system could cloud access or not. The RUC pilots have largely tested private-sector provision, one with government oversight. Participant access to private-sector account managers hampered few of them.^{47 48 49 50}

Configurations best suited to address this criterion: Equal for all configurations.

⁴⁶ See paragraph 5.4.1.2.

⁴⁷ Over 60% of OReGO participants said it was clear how to get help with questions about statement or invoice, while 30% had no opinion. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 22.

⁴⁸ 78% of California Road Charge Pilot Program participants were satisfied about the clarity of invoice and transparency of charges on invoice and only 4% were unsatisfied. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-49.

⁴⁹ 42% of California Road Charge Pilot Program participants were satisfied with ability to reach AM when needed but 50% found no reason to reach out. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-24.

⁵⁰ 81% of WA RUC Pilot Project participants said logging into account was easy and less than 5% said difficult. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 7, p. 34.

c. Responsiveness

Responsiveness in a RUC system is largely dependent upon corporate culture and management. The RUC pilots have largely tested private-sector provision, one with government oversight and none of these RUC efforts to date have shown much difficulty with responsiveness.^{51 52 53} Thus, no delivery method can at this point be said to have an advantage.

Configurations best suited to address this criterion: Equal for all configurations.

d. Issue resolution

Whether issues are resolved or not in a RUC system is dependent upon technical capability, corporate culture and management. The RUC pilots conducted to date have largely tested private-sector provision, one with government oversight and, while there is some room for improvement, none of these RUC efforts to date have shown much difficulty with issue resolution.^{54 55 56 57}

⁵¹ Over 76% of OReGO participants reported no problems getting answers to questions and 20% had no opinion and only 4% had problems. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 19.

⁵² 42% of California Road Charge Pilot participants were satisfied with promptness of responses but 51% found no reason to reach out. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-24.

⁵³ 38% of WA RUC Pilot Program participants said responses to questions were prompt; 54% had no questions and only 3% were unsatisfied with promptness. *Washington RUC Pilot Project Pilot Participant Survey #2*, Question 11, p. 14. Of those participants who had questions, 83% were satisfied with promptness and 8% were dissatisfied. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 2, Question 10, p. 21.

⁵⁴ Over 40% of OReGO volunteers who had a problem with MRD [mileage recording device] were able to get help and over 50% had no problems, and only about 8% had problems that were not resolved. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 22.

⁵⁵ 35% of California Road Charge Pilot Program participants were satisfied with resolution of issues but 55% had no issues and only 4% were unsatisfied. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-24.

⁵⁶ “15% of technology users reported experiencing a technical issue with their reporting method, with nearly half reporting the issue was not resolved to their satisfaction.” *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-45.

⁵⁷ 35% of WA RUC Pilot Program participants said their questions were answered and 54% had no questions, and only 5% were unsatisfied with issue resolution. *Washington RUC Pilot Project Pilot Participant Survey #2*, Question 11, p. 14. Of those participants who had questions, 76% were satisfied with issue resolution and 13% were dissatisfied. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 2, Question 10, p. 21.

Advantage: Equal for all configurations.

e. Communications and customer service

Whether a delivery method conducts communications and customer service well depends upon an appropriate level of resources, applied skillset, corporate culture and management. The RUC pilots conducted to date have largely tested private-sector provision, one with government oversight. Overall, pilot participants in all the RUC pilots were positive about their interactions with private-sector account managers and customer service.^{58 59 60} The only RUC effort with government agency oversight that engaged in participant communications was also regarded as positive.⁶¹ Nevertheless, agencies operating vehicle registries will likely implement manual methods of reporting in a RUC system and they are generally regarded as less proficient with customer service in most states.

Configurations best suited to address this criterion: Delivery methods primarily reporting configurations 2, 3 and 4.

⁵⁸ 96% of OReGO volunteers were satisfied with interactions with AMs and only 4% regarded their interactions with AMs as poor. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 7.

⁵⁹ 47% of California Road Charge Pilot Program participants were satisfied with communications with account manager, 43% had no contact with AM and only 4% were unsatisfied with communications with their account manager. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-24.

⁶⁰ 45% of WA RUC Pilot Program participants were satisfied with customer service; 46% had no need of customer service; only 4% dissatisfied with customer service. *Washington RUC Pilot Project Pilot Participant Survey #2*, Question 11, p. 14. Of those participants who had questions, 71% were satisfied with customer service and 8% were dissatisfied. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 7, p. 34. 95% of participants in the WA RUC pilot were satisfied about the clarity of communications they received. *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 11, p. 36.

⁶¹ Only 3% of participants regarded their interactions with OReGO staff negatively while 81% regarded their interactions positively. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 25.

Table A-4: Participant Experience Assessment

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Participant experience:					
• Simplicity, convenience, ease					
• Transparency of access					
• Responsiveness					
• Issue resolution					
• Capability of communications					

Key:

Indication	Meaning
	Poor/ Does not support
	Fair / Partially Supports
	Good / Mostly Supports
	Excellent / Fully Supports
	Equal/ No difference

III. Operational performance

Table A-5: Operational Performance Criteria

Category	Criteria	Type of Issue
Operational performance	<ul style="list-style-type: none"> • Technologies <ul style="list-style-type: none"> ○ System alignment ○ Accuracy and reliability ○ Availability of user choice • System integrity <ul style="list-style-type: none"> ○ Privacy ○ Data security ○ Easy to enforce ○ Costly to evade ○ Ability to detect tampering or fraud ○ Ability to audit • System alignment <ul style="list-style-type: none"> ○ Coordination with tolling system ○ Interoperability with other jurisdictions 	Operational issues

a. Technologies

A RUC program may have a number of combinations of manual or automated reporting methods. The WA RUC Pilot Program tested five reporting methods. Which reporting method or combination of reporting methods will be used in a Washington state RUC program will be decided by a combination of legislative policymaking and administrative practicality. The manner of mileage reporting available will impact the preference for delivery configuration.

i. System alignment

Government-only delivery (configuration 1) can best deliver a manual-only reporting mechanism in the state of Washington. In the WA RUC pilot, a number of the state's vehicle licensing offices (VLOs) participated in collection of odometer data for calculation of RUC for pilot participants choosing that option.⁶² The government agency could adopt the roles of oversight, data manager, and billing and collections under such a system.

If the RUC system used automated reporting, private-sector providers (configurations 2 and 3) would provide better opportunities to provide current technologies. In a competitive market, private-sector firms have the motivation to provide up-to-date

⁶² WA RUC Report on Vehicle Licensing Offices, April 22, 2019

technologies in order to maintain and improve market-share. Private-sector entities provided all the automated reporting methods for the Oregon, California, Washington, Colorado, Pennsylvania and Delaware pilots.

For a combination of manual and automated reporting methods, the combination of government and private-sector provider delivery (configuration 4) should yield a competent structure.

Configurations best suited to address this criterion: For automated reporting, private-sector providers (configurations 2 and 3). For a combination of manual and automated reporting, a combination of government and private-sector providers (configurations 4, 5). For manual reporting only, government-only delivery (configuration 1) would be the best configuration but manual-only reporting would also bring with it the inability to exempt out-of-state travel, thus reducing its attractiveness.

ii. Accuracy and reliability

For manual reporting, due to an odometer reading before and after comparison of photos, the WA RUC pilot results show that the accuracy of collecting mileage data through the privately operated VLOs was 100% for all miles of reported manual method users in what essentially could be a government-operated program (configuration 1). Even though the state's licensing offices (i.e., the VLOs and the county licensing offices) may collect manually reported mileage data, all other system elements—oversight and testing of data accuracy and reliability, invoicing, RUC collection—would be operated by a government agency (although there is the possibility for RUC collection at the licensing office level). It remains to be seen whether a statewide application of this licensing office-based system would have the same level of accuracy and reliability as this limited, initial test.⁶³ Manual reporting in the California pilot had the greatest percentage of non-reporting vehicles.⁶⁴ The percentage of non-reporting vehicles for manual reporting methods in the

⁶³ The WA RUC manual reporting method operated by eight VLO offices was overseen by the delivery partner consulting firm D'Artagnan Consulting LLP rather than a government agency.

⁶⁴ *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-26.

Washington pilot were similarly high relative to non-reporting for the automated reporting methods.⁶⁵

The error rates for the pilots in California and Oregon indicate a minimal number of issues with the in-vehicle, automated reporting devices provided by private-sector providers (configurations 2, 3, 4, 5).^{66 67} Smartphone reporting also had significant non-reporting issues in the California because of an obligation for periodic reporting odometer readings, a requirement not imposed for smartphone reporting in the WA RUC pilot project although the Washington non-reporting percentage was lower for the smartphone method over any other reporting method.^{68 69 70} Smartphone accuracy, reliability and compliance issues do not cast aspersions on any particular delivery configuration.

Configurations best suited to address this criterion: Private-sector entities because in-vehicle, automated reporting devices are aligned with provision by private-sector entities (configurations 2, 3 and possibly 4 and 5 if the government does not provide manual reporting) and provide the most accurate and reliable method of reporting. Manual reporting has yet to show consistent reliability owing to dependence upon reporting by resident drivers, but results from the Washington pilot's VLO reporting show enough promise to expect the possibility that government sector provision (configuration 1 and 4) of manual reporting may become accurate and reliable with further improvements.

iii. [Availability of user choice](#)

RUC payers have embraced the availability of choices of reporting method.⁷¹ Until the motoring public finds an overwhelming preference for a particular reporting method,

⁶⁵ In the WA RUC pilot, the non-reporting vehicles for the manual methods averaged about 20% while the non-reporting vehicles for the automated methods averaged under 10%. *WA RUC Pilot Project data analysis by D'Artagnan Consulting LLP*, June 20, 2019.

⁶⁶ Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 7.

⁶⁷ In the California pilot, location-aware, in-vehicle, automated reporting devices had an error rate ranging from 1.5% to 2.34% while non-location-aware, in-vehicle automated reporting devices had an error rate ranging from 0.98% to 1.69%; both are within the range of odometer accuracy and therefore acceptable. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-37.

⁶⁸ *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, pp. 2-26, 2-27.

⁶⁹ It must be noted that smartphone reporting required periodic odometer reporting for the California pilot.

⁷⁰ In the WA RUC pilot, the non-reporting vehicles for the smartphone methods exceeded 20%. *WA RUC Pilot Project data analysis by D'Artagnan Consulting LLP*, June 20, 2019.

⁷¹ 98% of pilot participants choosing automated devices in the WA RUC pilot project found them convenient; 92% of pilot participants choosing odometer reading in the WA RUC pilot project found this method convenient; 88% of pilot participants choosing the smartphone app in the WA RUC pilot project

having choices will improve public acceptance for RUC. If policymakers adopt a policy for equity of access, then providing payers access to multiple choices will treat all payers fairly notwithstanding their income, proficiencies with technologies, geographic locations or personal preferences.

While government agency-only delivery (configuration 1), single private-sector provider delivery (configuration 2) and combined government agency and single service provider delivery (configuration 5) could each procure multiple choices for mileage reporting, an open market for private providers (configuration 3) will provide a greater possibility for current and cutting-edge options. A combination of government agency and open market private-sector providers delivery (configuration 4) could assure choices for manual reporting and current or cutting-edge automatic reporting options.

The public may have a preference for automatic reporting.⁷² In the California pilot, the most common reporting methods considered “the right choice” by participants were automatic methods⁷³ and the most common devices considered the best choices other than the one actually chosen were automatic devices.⁷⁴

Configurations best suited to address this criterion: A government agency providing a manual reporting option combined with an open market of private-sector providers (configuration 4) providing cutting-edge automatic reporting options will likely provide the motorist with the broadest choices for mileage reporting. If policymakers prefer only automatic reporting choices (rather than manual reporting), they should also prefer an open market of private-sector providers (configuration 3).

found it convenient; and 72% of pilot participants choosing the mileage permit in the WA RUC pilot project found this method convenient; *Washington Road Usage Charge Pilot Evaluation: Survey Results*, Survey 3, Question 5, p. 33.

⁷² “Participants who chose an automated approach were more likely to agree that their reporting method was easy to use as compared to those using manual methods.” *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-33.

⁷³ Of participants choosing the built-in, telematics technology, 90% said it was the right choice; of participants choosing the without location, plug-in device, 90% said it was the right choice; of payers participants choosing the location-aware, plug-in device, 82% said it was the right choice. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-39.

⁷⁴ Of those participants who thought another reporting method was better than the one they chose, 30% chose built-in, telematics technology, 28% chose the non-location, plug-in device and 15% chose the location-aware plug-in device. Of all the other methods, only the odometer charge came close at 13%. *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-40.

b. System integrity

The integrity of a RUC system depends upon its ability to protect privacy and provide security for personal data of the payers as well as how well the system manages enforcement—evasion and detection of tampering and fraud—and the ability to audit.

i. Privacy

It is clear from public engagement, pilot participant survey results, and media stories that a RUC system *must* protect the privacy of personal information used for calculation and billing of a road usage charge. The new Washington law protecting general privacy of data will apply to RUC data but additional provisions specifically associated with RUC collection may be necessary for enactment of a RUC program.⁷⁵ With regard to delivery of a RUC system, the question is whether any of the potential delivery configurations will have an advantage or a disadvantage in applying privacy protections required by law.

To comply with legal privacy protection requirements, a government agency will adopt rules, procedures and protocols to assure compliance. The effectiveness of these policies will depend upon effective management.

The legal privacy protection requirements imposed for RUC will almost certainly apply to applications for involving private-sector entities. Reporting from the California pilot reveals that private-sector providers complied diligently with strict privacy protection requirements.⁷⁶

As the only operational RUC system for light vehicles in the United States, OReGO imposes by law protection of personally identifiable information upon both the government agency and its personnel as well as private-sector service providers, and their personnel, involved with RUC collection.⁷⁷ The overseeing government agency may add further requirements to ensure compliance with the privacy law in the private-sector provider's service level agreement with the agency. The effectiveness of these provisions for compliance with the privacy protection law will depend upon their nature and

⁷⁵ *WA RUC Model Privacy Policy for Road Usage Charging*, December 2018.

⁷⁶ *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, pp. 2-55, 2-57, 2-60, 2-61.

⁷⁷ Oregon's Road Usage Charge privacy protection provisions are contained in statute (ORS 319.915) and rules (OAR 731-090-0010).

management oversight by the agency.⁷⁸ No configuration will have the advantage in ensuring compliance with privacy protection law.

Providing RUC payers with choices for which entity collects the RUC and the manner of mileage reporting can be seen as an additional privacy protection measure. By having choices, payers may select the RUC payment approach which suits themselves, and thus best protects their personal privacy.

As the central feature for effective compliance with privacy laws, proper management gives none of the configurations an advantage. With regard to offering choices for account management and mileage reporting methods, the configuration offering the most viable current choices would have the advantage. Offering the most current choices will tend to favor, though not necessarily, the open market for private-sector service providers (configuration 3 and 4). A properly procured single private-sector provider (configurations 2 and 5) could also offer extensive mileage reporting choices but not the option for other managing accounts by another private-sector entity and the reporting choices will not necessarily be current or on the cutting-edge. Government-only delivery (configuration 1) will be challenged to offer several automated, current reporting options.

Configurations best suited to address this criterion: Multiple service providers in an open market (configuration 3), or a combination of government provider and multiple private service providers, depending upon the nature of the combination (configuration 4).

ii. Data Security

Security of personal information requires an entity collecting RUC to use best practices in managing data security. Best practices require continual monitoring and upgrading to address the continual assault on data systems. An overseeing governmental agency must ensure application of these best practices not only for a government-only delivery configuration but also for private-sector service provider configurations where the obligation is identified in the service level agreement between the service provider and the agency. Under any RUC delivery configuration, the effectiveness of data security

⁷⁸ “AMs [account managers] indicate that SLAs [service level agreements] are touch, but fair and effective.” Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 7.

measures will depend upon the ability of the overseeing agency to continually update best practices and manage either government or private entity compliance.

Configurations best suited to address this criterion: Equal for all configurations.

iii. Easy to enforce

For any delivery configuration, non-payment may be managed by whichever entity manages RUC accounts by taking legal debt collection activities and actions through the civil court system. More severe violations for fraud and tampering, however, will need government authority to impose appropriate sanctions. The law authorizing RUC will likely include civil penalties and perhaps criminal charges for varying degrees of transgressions. Notwithstanding the delivery configuration, the enforcement responsibility in a RUC system will rest with the overseeing agency. The most extensive RUC pilot programs did not apply useful enforcement regimes because these volunteer-based projects were not appropriate test environments for enforcement measures.⁷⁹

Configurations best suited to address this criterion: Equal for all configurations.

iv. Costly to evade

Whether a RUC will prove costly to evade depends on the level of interest imposed for late payment and the penalty structure adopted for non-payment in the authorizing legislation. For private-sector service providers, the overseeing agency should place interest and penalty provisions to discourage evasion in the service level agreement with the agency if they are not laid out in statute.

Configurations best suited to address this criterion: Equal for all configurations.

v. Ability to detect tampering or fraud

The effectiveness of identifying fraud and tampering will depend upon law enacted and the related rules, procedures and protocols established by the government agency and proper management of them. The ability to detect fraud and tampering will largely depend

⁷⁹ *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-28. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 7.

upon the technologies selected for mileage reporting rather than the delivery configuration.

Configurations best suited to address this criterion: Equal for all configurations.

vi. Ability to audit

Auditing of accounts and business systems will be necessary for either accounts managed by a government agency or a private-sector service provider. The overseeing government agency will have the responsibility to ensure auditing occurs on a regular basis. The resources applied, appropriate auditing practices and proper management will determine whether effective auditing occurs. Audit results from the California Road Charge Pilot Program indicate that a competitive market of private-sector service providers is feasible.⁸⁰ Audits completed for the OReGO program appear strong.⁸¹ No delivery configuration appears to have a disadvantage concerning auditing.

Configurations best suited to address this criterion: Equal for all configurations.

c. System cooperation

The government will not deploy a RUC system in a vacuum. The RUC system will have to integrate or, at minimum, coordinate with other government operations such as the Washington's tolling system and interoperability with other states' RUC systems as well as the Washington's fuel tax system during a transition from the fuel tax to RUC.

i. Coordination with tolling system

The state's tolling system uses an electronic pre-paid system called *Good to Go!* This toll-tag system automatically charges a driver's pre-paid account every time the driver's vehicle passes through a toll gantry. It is possible for RUC and *Good to Go!* to use a common device or the same accounting system.

⁸⁰ "The [California Road Charge Pilot Program] audit confirmed that the data for all test WINs in the VIN Summary Report were identical to the raw data used by account managers to prepare their monthly reports... This audit exercise did not result in any modifications to the data collection or administrative systems." *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-32.

⁸¹ "AMs [account managers in the OReGO program] agree that a SOC 2 audit is an effective way to ensure proper financial management of state revenues; ... that the SSAE 16 audit touches every aspect of the operation, including financial processes, privacy, and security of the operation." Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 7.

Since the state government operates the toll system by hiring a single operator (similar to RUC delivery configuration 2) in a proprietary, closed system, it may be possible for the government to combine the RUC and tolling systems. Should the government operate the RUC system solely (configuration 1), combining the two systems may prove problematic unless the government switches to operation of the toll system in addition to RUC.

If the overseeing agency prefers to have a private entity operate both the toll system and the RUC system, the government would have to expand the contractual authority of the private entity operating the toll system to include a single-provider RUC system (configuration 2). This would mean this entity would undertake a large expansion of its accounting system and learn to operate new mileage reporting technologies. If the current entity operating the toll system does not have this capability, then the government would have to find a new provider for both systems at the end of the toll service contract period. No tolling provider has yet to enter the RUC market although some tolling companies have shown interest.

As an alternative to a single-provider of both account management and technologies for tolling and RUC, the state could develop an open market for RUC or both (configuration 3). Technologically, a single device could provide RUC reporting as well as automatic toll-tag for a prepaid tolling account. In this case, the toll payer would have the choice of either using two devices—the mileage reporting device and the *Good to Go!* toll-tag—or use the combined device. The standards set by the government in a nonproprietary, open system should allow development and application of this combined technology. If the toll system uses a proprietary closed system, the two systems would likely prove impractical to combine until the government procures a new toll provider at the end of the toll service contract period.

Using a combination of government provision and an open market provision (configuration 4) or combination of government provision and single private-sector service provider (configuration 5) for both RUC and the toll system appears complex, without added value, compared to the other three delivery configurations. Overall, therefore, government agency-only delivery in any configuration (configurations 1, 4 or 5) is disadvantaged for integration with a tolling system.

While integration of the two systems may prove doable under some configurations and perhaps preferred, the tolling system does not have to integrate with the RUC system but

must, rather, coordinate with it. The key to success for coordination is simply providing consistent customer service and making coherent customer referrals from one system to the other. Proper coordination could occur under any of the configurations.

Configurations best suited to address this criterion: Configurations 2 and 3 (under the current government preference not to operate the toll system). Even under configurations 2 and 3, integration with the toll system will only be realistic if both the RUC and toll systems operate under an aligned nonproprietary open system, or a single provider operates RUC and the toll system under the same proprietary, closed system. Under a coordination strategy, there is no preference for any of the configurations.

ii. *Interoperability with other jurisdictions*

Essential to integration of RUC among the states, neighboring RUC systems must have the ability to interoperate. Without interoperability among RUC systems, the unresolved quandary concerning how to charge RUC to non-resident drivers will persist indefinitely beyond the transition phase for full RUC application. Fortunately, the early state investigations are largely working from the same model for collection of RUC.

Since Oregon adopted an open system for competing vendors in 2015, creating the standards for system operations by commercial vendors, the states that followed worked from the same design. While certain aspects of the standards continue to evolve,⁸² the essential underpinnings of the Oregon RUC system remain in place. The states involved with this evolutionary process should have little difficulty, if any, in adopting a common set of standards to facilitate interoperability.

Implementation of a hub for multi-state interoperability, as tested in the WA RUC pilot project, should put any question about interoperability to rest.⁸³ The pilot demonstrated a proof of concept for multi-state mileage reporting, accounting, and financial reconciliation. The hub itself was flexible to accept data, reports, and funds either directly from commercial account managers in an open system (as was done for Washington) or from

⁸² The standards are compiled in four documents: the mileage message, the interface control document, the systems requirement specifications and the business rules.

⁸³ [The California Road Charge interoperability] simulation does indicate that interstate interoperability is feasible, provided participants have a location-based mileage reporting approach, and that the mapping used by the account managers are accurate with respect to state boundaries." *Evaluation of the California Road Charge Pilot Program*, November 17, 2017, p. 2-30.

states (as was done for Oregon).⁸⁴ States plugging their RUC systems into a multi-state hub will agree to the basic standards of a RUC system.

Cooperating with other states to establish interoperability for RUC systems will be a matter for state governments to resolve. The configuration of the RUC system would only impact this cooperation if operated under a closed system or under contracts with private service providers that do not allow the government to evolve the standards.

Configurations best suited to address this criterion: Equal for all configurations, as long as the contracts for the private service providers allow the government to evolve the standards for the RUC system to accommodate interoperability.

⁸⁴ WA RUC Steering Committee Meeting, Preliminary results of interoperability test with other states, May 2, 2019, pp. 31-33.

Table A-6: Operational Performance Assessment

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Operational performance					
• Technologies					
○ System alignment	○	●	●	●	●
○ Accuracy and reliability	○	● for automatic	● for automatic	● for automatic	● for automatic
○ User choice	○	○	● for automatic	● for manual and automatic	○
• System integrity					
○ Privacy	○	○	●	● if open	○
○ Data security	◐	◐	◐	◐	◐
○ Easy to enforce	◐	◐	◐	◐	◐
○ Costly to evade	◐	◐	◐	◐	◐
○ Detection of tampering and fraud	◐	◐	◐	◐	◐
○ Ability to audit	◐	◐	◐	◐	◐
• System cooperation					
○ With toll system	◐ For coordination	● For integration	● For integration	◐ For coordination	○
○ Interoperability	◐	◐	◐	◐	◐

Key:

Indication	Meaning
○	Poor/ Does not support
◑	Fair / Partially Supports
◐	Good / Mostly Supports
●	Excellent / Fully Supports
◕	Equal/ No difference

IV. Practical availability

Table A-7: Practical Availability Criteria

Category	Criteria	Type of Issue
Practical availability	<ul style="list-style-type: none"> • Risk of Delivery • Resources • Technological and business system capabilities • Affordability • Continuity 	Practical issues

For RUC pilot programs in Oregon, California, Washington, Colorado, Pennsylvania and Delaware, several private companies have come forward to contract and operate mileage data collection and RUC invoicing and collection systems. These companies headquarter in Canada, France and the United States. There are also several other firms, with the requisite technical expertise, monitoring RUC market development in the United States for an opportunity to enter. There appears to be adequate industry interest to support private-sector involvement in RUC delivery (configurations 2, 3, 4).

a. Risk of delivery

Whether an entity responsible for delivery of a RUC system can ably bear the risk of delivery depends upon the sufficiency of the resources—person-power, budget, authority, computing power, technologies—assigned to the effort and the overall financial capability of the entity. There is fair certainty that the state of Washington can effectively manage the risk of the overall financial responsibility in a government-only delivery arrangement (configuration 1). Whether a private-sector service provider will also have sufficient overall financial capability to bear the delivery risk depends upon the entity procured. Delivery risk could be a factor in selection of a single private service provider (configurations 2 and 5). For a qualifications-based open market for multiple private service providers (configurations 3 and 4), the RUC system’s certification process could require adequate overall financial capabilities in order to pass the certification process. Whether the government agency responsible for selection of private-sector entities applies appropriate and effective measures for selection will be a matter of management and therefore not certain but likely for a capable agency. Further, whether the selected entities maintain adequate overall financial capabilities during the term of their involvement as a RUC service provider will depend upon appropriate contractual terms

and effective oversight by the procuring government agency and therefore not certain but likely for a capable agency.

Application of sufficient resources to manage risk is likely, though occasionally challenging, for government-only delivery (configuration 1) at various stages along the way. Whether private service providers will have sufficient resources to manage risk should be regarded similarly to having the overall financial capabilities. Sufficient resourcing should be a factor in selection of private-sector entities and also a requirement in the service contract. Success in this regard will depend upon the procurement capabilities of the procuring government agency.

Configurations best suited to address this criterion: The ability of government-only delivery (configuration 1) to bear the risk of delivery is nearly certain. Appropriately procured private-sector entities (configurations 2, 3, 4 and 5s) could also have adequate capacity to bear the risk of delivery but this depends upon strict contractual provisions and the competency of the procuring government agency. An open market for private-sector providers (configurations 3 and 4) will have the best opportunity to accept an entity's departure from the market through a shift of payers to another entity. Failure of a single private provider (configuration 2 and 5) would not have this flexibility.

b. Resources

Appropriate levels of funding, personnel and technologies are necessary for a successful delivery model. Although there are many adequately resourced government programs, there are also many government programs which cannot claim this capability, particularly during a transition from small to large. Private-sector companies tend to resource a profitable enterprise, which a RUC system will be once sufficient payers participate. Recent RUC pilots in Oregon, California and Washington indicate the availability of adequate resourcing for private-sector functions. Any difference in RUC delivery models will depend upon the individual entities involved and whether government procurement office competently procure private-sector entities with adequate resources.

Configurations best suited to address this criterion: Equal for all configurations.

c. Technological and business system capabilities

Research labs and private-sector companies on the cutting-edge can provide the evolving technological and business system capabilities necessary for a RUC system.

Governments tend to lag behind the technologies and business systems curve. The government may procure a single private-sector provider (configuration 2) starting on the cutting-edge but then fall behind for lack of urgency after securing the contract.

Configurations best suited to address this criterion: Open market private-sector service provider delivery (configuration 3) will more likely consistently provide appropriate technical and business systems for RUC. Any company that does not maintain its capabilities will fall out of the market and its customers shifted to another private entity. Combined government and private service provider delivery (configurations 4 and 5) will have the same advantage if operated as an open system.

d. Enabling System Affordability

No matter the configuration, cost/benefit research in RUC financial models for Oregon, California and Washington indicates that a large program of at least a million payers may be necessary to generate significant net revenue and shrink the relative administrative costs to acceptable levels, generally regarded as below 10% cost of collection.⁸⁵ Private-sector entities participating in those RUC efforts agree and believe that a multi-state RUC program may be needed to enable system affordability.⁸⁶ The best way to accomplish a multi-state RUC program alignment would be through an interoperability hub populated by private-sector service providers participating in an open market (configuration 3 and 4). A single provider, whether government or private entity operated (configurations 1 and 2), should have significant difficulties aligning with other states. Whatever the configuration, early stage, introductory RUC programs with only a few thousand participants will have difficulty attaining sufficient net revenue to cover costs.⁸⁷ This may

⁸⁵ California Department of Transportation, *California Road Charge Pilot Program Final Report*, 2017, p. 71; Washington Road Usage Charge Steering Committee, *Meeting #12 Briefing Book*, December 1, 2015, p. 12; Oregon Department of Transportation, *Road Usage Charge Pilot Program 2013*, p. 27

⁸⁶ "AMs [account managers] believe that a RUC needs to be mandatory and multi-state in order to generate sufficient revenue, both for the state and for private AMs." Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 12.

⁸⁷ At the introductory levels, an open market for a RUC program will be challenged to generate positive net revenue. For example, Oregon's OReGO program, with its statutory limit of 5,000 volunteer participants, generates very little net revenue for this very reason. Kathryn Jones, Maureen Bock and the Oregon Department of Transportation, *Oregon's Road Usage Charge: The OReGO Program Final Report*, April 2017, pp. 49-50.

only happen once a RUC program reaches a viable number of participating RUC payers, likely in the range of 50,000 to 100,000.

Configurations best suited to address this criterion: Configurations 3 and 4 because of an ability to participate in a multi-state RUC program alignment. An open market for private-sector service providers (configurations 3) has a slight advantage over the combined government and open market (configuration 4) because the government provision costs do not have to be covered.

e. Continuity

RUC program delivery must maintain continuity for as long as the state wants the revenue provided. The government-only delivery model (configuration 1) certainly provides the best assurance of continuity. Private-sector firms can go out of business but government agencies tend to endure, especially if there is support for the underlying program. There is more risk that a single private-sector provider (configuration 2) will go out of business than an entire open market of private-sector providers (configurations 3 or 4). There is, however, a greater likelihood that one private-sector provider will go out of business in an open market supported by multiple firms; yet the open market can manage that occurrence by providing a simple way for RUC paying customers to switch to another certified private-sector provider within the market. Indeed, the only operational RUC program in the United States, Oregon's per-mile road usage charge program, had one private-sector provider leave the program during the first year and shifted that provider's customers to another provider, although an independent reviewer suggests the process could be made easier.^{88 89} The way to assure continuity in an open market is for

⁸⁸ "If an AM [account manager] leaves the program or if a volunteer wants to switch AMs, volunteers must start over by exiting the program and re-registering with a new AM. Many volunteers have been willing to do this. However, as the program continues, and especially if it expands, ODOT should consider having processes, procedures, and systems in place that allow volunteers to switch between AMs without re-registering. Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Account Manager Satisfaction and Program Improvement Report*, January 12, 2017, p. 10.

⁸⁹ During WA RUC pilot operations, the pilot delivery team experienced the positive benefits provided by competition and the ability to mitigate operational risks. When one service provider entered chapter 11 bankruptcy, the pilot delivery team had the option of migrating participants to the other service provider, albeit this option ultimately proved unnecessary to deploy.

the government to procure multiple certified private-sector providers as well as an open and continual procurement and certification opportunity for newly interested companies.

Configurations best suited to address this criterion: Government-only delivery (configuration 1) has the best chance of maintaining continuity with a properly structured open market of private service providers under an open system (configuration 3 and 4) close behind. Correctly managed, there will be little difference between configurations 1, 2, and 3 for this criterion. The biggest risk of a lapse in continuity would occur with a single private-sector service provider (configurations 2 and 5).

Table A-8: Practical Availability Assessment

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Practical availability					
• Risk of delivery					
• Resources					
• Technology & business system					
• Enabling System Affordability					
• Continuity					

Key:

Indication	Meaning
	Poor/ Does not support
	Fair / Partially Supports
	Good / Mostly Supports
	Excellent / Fully Supports
	Equal/ No difference

V. Flexibility

Table A-9: Flexibility Criteria

Category	Criteria	Type of Issue
Flexibility	<ul style="list-style-type: none"> • Open to competing vendors (open system) • Adaptability for policy changes • Ability to innovate and evolve technology and business systems • Scalability • Transition, phasing 	Design issues

To enable success for a RUC system, the delivery configuration must have the flexibility to accommodate an open system, adapt to policy changes by the legislature, innovate and technically evolve, scale to a large size and enable transition to a full RUC application.

- a. Open to competing vendors (open system)

This assessment criterion, adopted by the WA RUC Steering Committee as a guiding principle, indicates a preference for configurations 2, 3, 4 and 5 which are the only configurations which could facilitate an openness to competing vendors. In a single private provider procurement (configurations 2 and 5) competition would occur only at the selection stage and, as such, is not a place for continuous competition for actual RUC paying customers among competing vendors. Adoption of an open system is the only way to facilitate such competition among vendors.⁹⁰

Configurations best suited to address this criterion: Configuration 3 which supports open market competition among private-sector service providers and configuration 4 for a combination of government agency delivery and private-sector delivery but only if supportive of open market competition. A government-only delivery (configuration 1) cannot meet this criterion.

⁹⁰ The only definition of *open system* in law is contained in the statutes enacted in Oregon for the Per-mile Road Usage Charge Program. ORS 319.900(1) says “‘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.”

b. Adaptability for policy changes

Any delivery configuration can adapt for policy changes if the supporting set of standards and contracts contain sufficient flexibility.

Configurations best suited to address this criterion: Equal for all configurations.

c. Ability to innovate and evolve technology and business systems

Unless an open system is required by law, government-only delivery would be susceptible to selection of closed system technologies and business systems that will quickly go out-of-date. Without an open system mandate, a single private service provider would tend to use a closed system to protect its position. Closed systems impede innovation and technical evolutions.⁹¹ Only real competition amongst private-sector providers for RUC paying customers in an open market will provide a significant, real-time incentive for innovation and technical evolution of RUC systems. To operate efficiently, the open market must allow the free flow of competitors into and out of the market. This will require adoption of a perpetually available opportunity for access to a vendor certification process and an ability to enter into a binding contract with the state or other authorized entity at any time. No state has issued such an open opportunity procurement document, although there are indications that Oregon intends to do so when the RUC market matures sufficiently.⁹²

Configurations best suited to address this criterion: The open market for private-sector service providers (configuration 3) meets this criterion and the combination of government delivery and private-sector delivery (configuration 4) could meet this criterion as well if operated as an open market. Government-only delivery (configuration 1) and single private-sector provider delivery (configurations 2 and 5) have less incentive to innovate and evolve technologies and systems and indeed will not do so if operated under a closed system.

d. Scalability

Any system for application to a small number of vehicles—such as Oregon’s application of RUC to volunteers and Oregon and Utah’s application of RUC to those opting-in to avoid higher flat fees—must be able to scale upward from thousands to millions of

⁹¹ A “closed system” is proprietary in nature which only one provider is able to support.

⁹² Conversation with Maureen Bock, manager of the ODOT Office of Innovation, Spring 2018.

vehicles for a RUC delivery configuration to be viable for the future. Though theoretically scalable, each delivery method must obtain resources to grow larger. An open market of private-sector providers, by nature, is designed to seek additional RUC paying customers and adapt to growth. There is less assurance in this regard with government-only delivery or single private-sector service provider delivery. Government agencies tend to have a tough time obtaining approval for the large appropriations necessary for timely growth to scale for configurations 1, 2 and 5.

Configurations best suited to address this criterion: The open market private-sector providers delivery (configuration 3) and a combination of government delivery and private provider delivery (configuration 4), if operated under an open system, naturally will adapt to scalability needs more quickly than two configurations 1, 2 and 5.

Table A-10: Flexibility Assessment

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Flexibility					
• Open to competing vendors					
• Adaptability for policy changes					
• Ability to innovate and evolve					
• Scalability					

Key:

Indication	Meaning
	Poor/ Does not support
	Fair / Partially Supports
	Good / Mostly Supports
	Excellent / Fully Supports
	Equal/ No difference

VI. Policy alignment

Table A-11: Policy Alignment Criteria

Category	Criteria	Type of Issue
Policy Alignment	<ul style="list-style-type: none"> • Transparency of system • User pay system • Alignment with state's energy, environmental and congestion management goals • Fairness and equity 	Design issues

Generally, public policies adopted by the legislature will determine the transparency of a RUC system, whether RUC is a user pays system that aligns with other statewide goals and the fairness and equity of the application.

a. Transparency of how the system is paid for

The state's gas tax is hidden within the price of the gasoline purchase amount. If collected at the fuel pump, the transaction structure could also hide the per-mile charge from view of the payer. If RUC is collected through presentment of an invoice in an account-based system, collection becomes transparent to the payer. Transparency is largely a matter of policy and management which can be applied under any RUC delivery method. The purpose of the various RUC pilots, which applied either a combination of government and private-sector provision (configurations 4 and 5) or more than one private-sector providers (configuration 3), was clear to the participants.⁹³

Configurations best suited to address this criterion: Equal for all configurations.

b. User pay system

A per-mile charge is by its nature a user pay policy that will not be affected by RUC delivery method.

Configurations best suited to address this criterion: Equal for all configurations.

⁹³ "It was clear that the purpose of the OReGO program is to provide a method to fund the ongoing maintenance of Oregon's roads and bridges." Public Knowledge LLC, *Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report*, January 12, 2017, p. 19.

c. Alignment with state’s energy, environmental and congestion management goals

Whether the structure of the per-mile charge aligns with the state’s energy, environmental and congestion management goals depends upon to whom the charge applies and the rate structure rather than any of the delivery configurations.

Configurations best suited to address this criterion: Equal for all configurations.

d. Fairness and equity

Whether the payers regard a per-mile charge as fair or those with policy interest regard the per-mile charging system as equitable will depend upon to whom the charge applies, the rate structure and individual perspective rather than any of the delivery configurations. The overwhelming majority of payers participating in the OReGO program considered fair a flat-rate, per-mile charge that everyone paid while only a small fraction regarded the flat-rate, per-mile charge for everyone as unfair.⁹⁴

Configurations best suited to address this criterion: Equal for all configurations.

Table A-12: Policy Alignment Assessment

Assessment of RUC Delivery Configurations	Configuration 1 (Government-Only)	Configuration 2 (Single Provider)	Configuration 3 (Open Market)	Configuration 4 (Combination/ Open)	Configuration 5 (Combination/Single)
Policy Alignment					
▪ Transparency of system					
▪ User pay system					
▪ Alignment with state's other policy goals					
▪ Fairness and equity					

Key:

Indication	Meaning
	Poor/ Does not support
	Fair / Partially Supports
	Good / Mostly Supports
	Excellent / Fully Supports
	Equal/ No difference

⁹⁴ Public Knowledge LLC, Oregon Department of Transportation OReGO Program: Volunteer Satisfaction and Program Improvement Report, January 12, 2017, p. 18.

Appendix B: Transition Policy of WA RUC Steering Committee Work Plan

On November 9, 2017, the Washington Transportation Commission presented a work plan for the Washington Road Usage Charge Steering Committee containing the following transition policy.

Transition policy

a. Definition of the issue

Because of the importance of fuel tax system to transportation funding and debt service, any future RUC policy must account for the realistic prospects of moving away from a fuel tax and toward a RUC over a period of time.

b. Relevance to RUC

Although RUC policy could be implemented at any time, it is critical that lawmakers, should they move toward adopting such a revenue mechanism, appreciate the impacts of the method of transition on RUC implementation and operations. A swift transition from fuel tax to RUC could create substantial burdens for state agencies, while a slow or protracted transition may neglect the opportunity for revenue sustainability.

c. Research approach

The approach to this research is to build on prior work done by the Steering Committee that considered example transition approaches. The project team will work with the Steering Committee to construct a range of transition approaches, describe their policy features, and analyze their impacts on revenue, system operations, costs, motor fuel tax bonds, and public acceptance. Examples of transition approaches range from “big bang” (all vehicles subject to RUC at once, while eliminating the gas tax) to gradual (only new vehicles subject to RUC, with older vehicles continuing to pay the gas tax).

Appendix C: Transition Pathways to a Final End State for a RUC Program

This appendix suggests a potential transition pathway for each of the three final end state delivery configurations recommended in chapter 5. These recommended final end state configuration possibilities are:

- ▶ Government-only delivery (configuration 1);
- ▶ Open commercial market of private-sector service providers (configuration 3); and
- ▶ Combination of government and private-sector open market (configuration 4).

I. Potential transition pathways for RUC delivery configurations

There are four viable transition pathways to a fully mature, final end state for a RUC delivery configuration.

- a. Government start: Government-only transition (transition pathway 1).
- b. Solo provider start: Single, private-sector service provider with open system (transition pathway 2).
- c. Solo provider start: An open commercial market for multiple, private-sector service providers with a single entrant to start (transition pathway 3).
- d. Combination start: Combination of government agency and single, private-sector service provider (transition pathway 4).

II. Additional criteria for assessment of transition pathways

Assessing the transition pathways for final end state delivery configurations must go beyond the assessment criteria laid out in table 4-2 to consider additional criteria.⁹⁵ The four additional criteria critical to assessment of transition pathways are as follows:⁹⁶

- ▶ Foundational (to the ultimate delivery configuration);
- ▶ Adaptable (from phase to phase);
- ▶ Timely (quickly available for each phase of implementation);
- ▶ Ease of implementation.

III. Assessment of transition pathways to ultimate RUC system

a. Assessment of transition pathways to government-only delivery

To achieve a final end state of government-only delivery (configuration 1), the easiest pathway to implement would invest a government agency with adequate staffing, resources and expertise from the start and then, as the program grows, give the agency the necessary resources at each growth stage. This would ensure the government-only transition pathway (transition pathway 1) is foundational for the ultimate system. Whether this pathway would also be adaptable and timely will depend on the agency's ability to obtain and maintain sufficient expertise and acquire adequate staffing and resources each time a vehicle segment joins the program. Governments tend to lag in these functions because the budgetary process is often slow and sometimes unpredictable, but this tendency is not a certainty in every case. Each state must evaluate the responsiveness and nimbleness of its own budgetary process in this regard.

⁹⁵ Note that this paper assumes that procurement of each transition pathway will ensure functionality for the program characteristics and transition capabilities. As such, functionality is not considered in this paper as a criterion for discernment of transition pathways.

⁹⁶ It must be noted that an additional factor may strongly influence the selection of a transitional pathway: political viability. This paper does not have sufficient information to evaluate political viability. Indeed, political viability is too fluid and elusive for evaluation as enduring consideration anyway.

If the government agency responsible for RUC implementation feels short of the staffing, resources and expertise necessary to implement RUC itself (transition pathway 1), procurement of a single, private-sector service provider for a limited duration to commence program implementation (transition pathway 2)⁹⁷ before shifting to government administration could prove a viable approach. The single service provider would enroll RUC participants, provide mileage reporting technologies or services, collect mileage data and manage invoicing and RUC payer accounts. The main question is whether the single service provider would apply its own proprietary system or adhere to requirements of an open system adopted by the government. Shifting from a proprietary closed system of a single service provider to entirely government administration could prove problematic and expensive. To make a single service provider viable as a transition option, the government agency should adopt and apply open system performance criteria and standards to the single service provider's implementation to enable transition to government administration when the government feels properly resourced.

Transition pathway best suited to achieve government-only delivery of ultimate system:

Procurement of a single, private-sector service provider for a limited duration (transition pathway 2) operating under an open system adopted by the government. Although not foundational to the final end state of government operations, a single private-sector service provider offers the greatest certainty, simplicity, and allows transferability to the ultimate government-operated RUC system as long as the single provider operates under an open system adopted by the government in the introductory stage of the RUC system.

b. *Assessment of transition pathways to open commercial market for multiple service providers delivery*

An open commercial market for multiple private-sector service providers (configuration 3) may begin at the initial introductory stage of program implementation without a transition pathway and continue through growth periods to a fully mature, final end state. This maintains certainty of an ability to adapt to a fluid transition as it is perfectly foundational

⁹⁷ Note that transition pathway 2 has characteristics similar to configuration 2. While configuration 2 may not be advisable as a final end state, its structure has advantages as a transition pathway provided the single, private-sector service provider operates under an open system adopted by the government instead of the single provider's own proprietary system.

to the final end state of an open commercial market and provides the easiest and timeliest transition. To undertake an open commercial market from the start, the overseeing government agency must adopt open system performance criteria and standards,⁹⁸ adopt a market contract, procure and manage multiple providers and develop a certification process to ensure the providers can meet the standards before commencement of services. This approach is not simple for an initial implementation of a RUC program by a single state. Nevertheless, Oregon DOT has shown that putting together the structure for an open commercial market and management of multiple private-sector service providers can work in the initial implementation stage despite the challenges.⁹⁹

If the government has concerns about putting together such a complex arrangement from the outset or is unwilling to accept the risk of engaging and managing multiple providers in an introductory program, procuring a single, private-sector service provider to operate under an open system (transition pathway 2) could aid the transition. The government would have to adopt and publish the standards for the open system so that transition to the next phase, an open commercial market, can occur without difficulties, although the government would still have to adopt the open commercial market standards and contracts before opening the RUC market.¹⁰⁰ This pathway offers simplicity and ease of initial implementation, and thus fairly easy transferability to the open commercial market but not necessarily foundational for an open commercial market (configuration 3) if the open system standards do not account for transition to the open market. Timeliness of

⁹⁸ The open market performance standards will be developed technical documents such as the Interface Control document, the Systems Requirements Specifications document and the Business Rules document. Examples of these foundational documents are now operational for Oregon DOT's OReGO program.

⁹⁹ Oregon's OReGO program launched an open commercial market strategy on July 1, 2015. The launch was based on open system performance criteria and standards adopted by the government and negotiation of a market contract but this qualifications-based procurement opportunity limited the number of initial private-sector service providers for the initial introductory stage of the program. The Oregon DOT held back opening up the market to establish easy entry and exit until the number of RUC payers grows enough to warrant additional private-sector service providers. For this approach, Oregon DOT has endured the trials and tribulations of working with three private-sector service providers and withdrawal of one service provider, including transfer of the withdrawing service provider's customers to another provider.

¹⁰⁰ This paper does not consider a transition pathway for procurement of a single, private-sector service provider under a *closed system* because it is, by definition, not viable to transition from a closed system to an open market based on an open system. The government would essentially have to jettison the closed system and start from scratch in putting together the open system. There is no real transition.

the transition may also be affected as the government would be compelled to develop and adopt new open system performance standards for the open commercial market.

Alternatively, the government may take a step further at the start by procuring a single, private-sector service provider as the first entrant into an open commercial market under the same open system performance requirements and market contract that will be required for the open commercial market (transition pathway 3) This pathway would lead to an easy transition, better meeting the criteria for foundational, adaptability, ease of implementation and timeliness than any other transition pathway.¹⁰¹ As the first entrant into an open market, a single provider could simplify the work of a single state government by removing or reducing the procurement and oversight responsibilities of regulating an open market and managing multiple private-sector providers.¹⁰²

The timing for transition from a single, private-sector service provider (either transition pathway 2 or 3) could vary to align with the emerging circumstances. Among the circumstances to consider is the agency's resourcing, competency and confidence to manage an open market and whether the RUC program grows to a sufficient number of customers to attract multiple private-sector service providers.

Transition pathway best suited to achieve open commercial market for multiple providers:

If a fully open commercial market does not occur at the start of a RUC program, procurement of a single, the best transition pathway is a single, private-sector service provider as the first entrant into an open commercial market with open system performance standards adopted at the beginning of the program (transition pathway 3). The government may find this pathway more laborious at the start¹⁰³ but the transition to

¹⁰¹ Utah DOT, the second state to enact an operational RUC program, intends to do just this, implementing the initial stage of the program by procuring and contracting with a single private-sector service provider then transitioning to an open commercial market later. Given the fast pace from enactment to implementation mandated by legislation, the desire to minimize additional bureaucracy, and the relatively small scale of the initial program, Utah deemed this approach most practical.

¹⁰² Indeed, the original, single, service provider could seek to remain in the open commercial market and compete with the newcomers once the open market commences under either transition pathway 2 or 3.

¹⁰³ The government must develop open market performance standards in technical documents such as the Interface Control document, the Systems Requirements Specifications document and the Business Rules document. See Oregon DOT's OReGO program for examples.

the open commercial market will be foundational, completely fluid, and can be completed in a timely way. Something similar could be accomplished by a single, private-sector service procured for a limited duration and operating under an open system not prepared for a commercial market (transition pathway 2) but there could be delays or uncertainties when the government transitions to the open commercial market at the end of the contract term. A open system that is general in nature is not as adaptable as an open system specific to the intended open commercial market.

c. [Assessment of transition pathways to combination of government agency and private-sector open market delivery](#)

All described transition pathways could achieve a final end state that involves a combination of government agency and private-sector open market (configuration 4). A government agency could begin the program (transition pathway 1), adding an open commercial market in a later phase. Or, the program could open with a single private-sector service provider operating under a general open system (transition pathway 2) and add the government agency and an open commercial market in later phases. As a third option, the government could procure a single private-sector service provider as the first entrant into an open commercial market with specific open system performance standards adopted at the beginning of the program (transition pathway 3). As a fourth option, the RUC program could start with a combination of government agency and single private-sector service provider under an open system (transition pathway 4) of a general nature (4a), or with specific open system performance standards required for an open commercial market (4b), leading to transition to the final end state at a later time.

Leading with a government agency (transition pathway 1) may prove problematic if technical expertise is required to implement automatic reporting options, which is likely, for a preferred final end state involving a combination of government agency and private-sector open market. Transitioning from government provision of automatic reporting to an open commercial market could also prove complex because it would require all existing payers to shift either reporting method or technology.

Starting with a single private-sector service provider under a general open system (transition pathway 2) could offer government operations (which is likely to be for manual reporting options) and open system operations (which is likely to be automatic reporting

options). This pathway is not necessarily easy because the government is better positioned to deliver manual reporting options in most cases. This pathway is also not necessarily foundational for the open commercial market portion if the open system standards do not allow for transition to the open market. Timeliness of the transition may also be affected as the government would be compelled to develop and adopt new open system performance standards for the open commercial market.

Beginning with a combination of government agency and single private-sector service provider as the first entrant into an open commercial market with the same open system performance standards as the final end state (transition pathway 4b) may have the least complexity for transition and offers a foundation for a final end state for a combination of government agency and open commercial market for multiple, private-sector service providers (configuration 4).

Transition pathway best suited to achieve a combination of government agency and private-sector open market delivery: Procurement of a combination of government agency and a single, private-sector service provider as the first entrant into an open commercial market with the same open system performance standards as the ultimate commercial market (transition pathway 4b). The other transition pathways will prove cumbersome because there will be more complexities and risk by either adding the government or adopting the specific open system performance standards required for an open commercial market at a later time.



A-14

**SURVEY RESULTS FROM DOL SUBAGENT VEHICLE
LICENSING OFFICE ON WA RUC EXPERIENCE**

 **WA RUC**



Survey results from DOL Subagents Vehicle Licensing Offices on their WA RUC experience

April 23, 2019



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Document Control Record

VERSION	MAIN CHANGES	CONTRIBUTIONS FROM	DATE
V01a	Development of draft outline based on surveys and contact with VLOs	S Morello	20190410
V02a	Complete first sections of report	S Morello	20190410-17
V03a	Draft version of report completed and circulated for review	S Morello	20190417-22
V04c	Submitted version	S Morello	20190423

1 Introduction

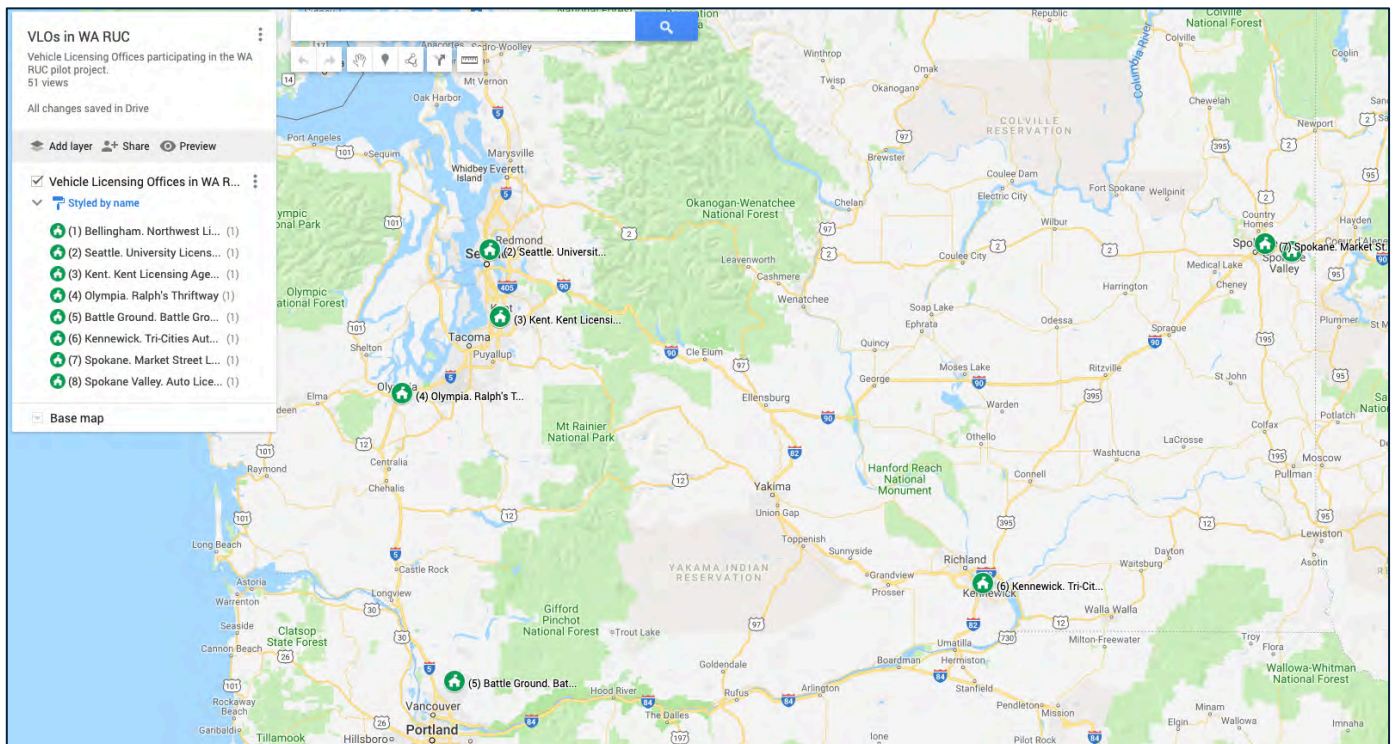
1.1 Purpose and Background

Purpose. The purpose of this report is to summarize the involvement of Vehicle Licensing Offices (VLOs) during the Washington Road Usage Charging (WA RUC) pilot project and provide inputs to the Final Report.

Background. When the WA RUC pilot project activities began, a key objective was to develop and pilot a method for those that do not have a mobile device with a camera or prefer not to use their personal mobile device for privacy reasons. For this reason, the WA RUC Pilot Project Team reached out to the Department of Licensing (DOL) to seek the participation of VLOs to provide service to walk-in participants needing to submit periodic pictures of their odometer and license plate. Following from this meeting, the DOL agreed to the involvement of VLOs and provided support by helping to establish contact between the Project Team and VLOs about their potential participation.

Following from the support of the DOL and in coordination with the DOL, the project team selected eight VLOs to participate from around the state as noted in the following map.

Figure 1: Map of the Eight Vehicle Licensing Offices that Participated in the WA RUC Pilot Project



1.2 Key Stages and Summary of Involvement of VLOs

The following table provides a chronological summary of key activities undertaken by the Project Team during planning, recruitment, set-up, training, surveys and closeout activities concerning involvement VLOs in the WA RUC Pilot Project.

Table 1: Key stages and dates of VLO involvement

Activity	Key Date(s) / Period	Comments
1. Present Plan for Department of Licensing VLOs in WA RUC Pilot Project to the DOL	November 2017	DOL subsequently accepted the plan.
2. DOL sends email to VLOs selected and introduces the Project Team, led D'Artagnan Consulting	Early December 2017	Reaction to email was favorable which led the Project Team to contact VLOs.
3. Project Team has first meetings with VLOs	8-22 December 2017	Following from meetings with 10 pre-selected VLOs, eight agreed to participate in the Pilot Project.
4. Project Team undertakes on-site training of VLO representatives	28 December 2017 – 29 January 2018	VLOs received training with User Manual and iPhone. Agreements signed and executed.
5. WA RUC Pilot Project launch	30 January 2018	Project Team informs VLOs of launch.
6. Survey #1 for VLO representatives	March-July 2018	Project Team developed the survey questionnaire and sent weblinks to VLO reps. Focus of survey was onboarding and training for VLOs.
7. Mobile VLO	June 2018	Project Team contacted three Participants needing mobile support and organized and held three one-one-one meetings.
8. VLO meetings with Project Team	August-September 2018	Project Team visited VLOs to check-in and obtain direct feedback from VLOs concerning the pilot.
9. Closeout Activities	December 2018-February 2019	Project Team provided an update via email in early Dec 2018, and visited all VLOs in Jan-Feb 2019 to closeout, recover iPhone, and administer and distribute Survey #2. Focus of survey was on services provided and future interest to provide similar services.

1.2.1 Plan for Department of Licensing VLOs in the Pilot to the DOL

In early November 2017, the D'Artagnan Project Team organized a meeting with the Department of Licensing (DOL) to present a detailed plan for the involvement of Vehicle Licensing Offices (also referred to as subagents).

The presentation and discussion addressed the following aspects of involvement of VLOs in the WA RUC pilot:

- ▶ Objectives
- ▶ Roles and Responsibilities
- ▶ How it Works
- ▶ MVerity Web App
- ▶ Recruitment of Subagents
- ▶ Proposed Subagent Location
- ▶ Participant Agreement
- ▶ Training
- ▶ Support for Subagents and Participants
- ▶ Subagent Incentives and Compensation
- ▶ Outreach and Engagement
- ▶ Schedule

1.2.2 DOL reaches out to VLOs

Following from the Project Team’s meeting with the DOL and the DOL’s subsequent acceptance of the plan, the DOL provided introductions to each VLO for the Project Team via a personalized email. Reaction from the email was positive and the Project Team followed up and set up initial meetings with all 10 VLOs.

1.2.3 Project Team has first meetings with VLOs

During the period of December 8-22, 2017, the Project Team met 10 VLOs of which eight (8) signed up as shown in Figure 1 above. The purpose of the meeting was to explain the context and background to the WA RUC Pilot Project, and enlist their involvement. Specifically, each VLO was asked for their agreement to participate in the 12-month pilot to provide WA RUC odometer reporting services to walk-in pilot participants by lending them an iPhone to enable them to submit periodic pictures of the license plate and odometer.

For each meeting, the following documents were presented and distributed to VLO owners and representatives (Appendix A includes the documents):

- ▶ Fact Sheet for the Washington Road Usage Charge Pilot Project
 - > Two-page summary of the pilot
 - > Explains what is a road usage charge
 - > Outlines key reasons why Washington State is conducting the pilot
- ▶ Presentation by Washington State Transportation Commission Executive Director, Reema Griffith
 - > Definition of the key issues concerning future funding gap
 - > Describes the potential for road usage charging to replace the gas tax
 - > Summary of key lessons learned from past and current research
 - > Role of the WA RUC Pilot Project in reaching out to the public to participate in the Pilot and design of a potential solution

- ▶ Frequently Asked Questions (FAQs) comprising frequently asked questions as available on the WA RUC website.
- ▶ Role for VLOs in the Pilot (PowerPoint presentation)
 - > Objectives and Approach
 - > Roles in Pilot
 - > How it Works
 - > MVerity Web App
 - > Training
 - > Support for Subagencies and Participants
 - > Incentives and Compensation
 - > Outreach and Engagement
 - > Schedule
 - > Outreach and Engagement

1.2.4 Project Team undertakes VLO training on-site

During the period December 28, 2017 to January 29, 2018, the Project Team organized and undertook on-site training sessions with each of the eight VLOs. For each training session, the following documents were presented and distributed to the VLO reps (Appendix B includes the documents):

- ▶ Training Module for Vehicle Licensing Offices (VLOs) (PowerPoint presentation)
 - > Two-page summary of the pilot
 - > Explains what is a road usage charge
 - > Outlines key reasons why Washington State is conducting the pilot
- ▶ User Manual for VLOs including
 - > Instructions for Customer Service Representatives (CSRs)
 - > Troubleshooting and Support
 - > Frequently Asked Questions for CSRs
 - > Transactions log to be updated each time a CSR interacts with a Participant to take pictures of their license plate and odometer reading.

1.2.5 WA RUC Pilot Project launch

On Wednesday, January 30, 2018, Project Team sent an email to each VLO informing them of the launch of the WA RUC Pilot set for Wednesday, January 31, 2018. All VLOs had been informed prior that the start date would be late January.

Prior to the launch of the Pilot Project, all eight VLOs completed the on-site training and signed a formal agreement between the VLO and D’Artagnan Consulting. Key aspects of the Agreement included:

- > Eligibility and requirements
- > Duties of the VLO
- > Services to be provided with corresponding compensation.

1.2.6 Survey #1 for VLO representatives

Beginning in March 2018, the Project Team developed a set of survey questions to obtain information from the VLO representatives concerning their knowledge and understanding of the WA RUC Project Pilot and related aspects of road financing. In addition, the survey included questions about feedback from VLO representatives on the onboarding process and on-site training.

The survey had a total of 16 questions covering four categories:

- ▶ Warm up questions like name of the Vehicle Licensing Office (all responses were anonymous)
- ▶ On-site training
- ▶ Providing WA RUC Pilot Project services included questions about initial contact with Participants
- ▶ General feedback.

A key issue that came to light about completing the survey concerned inciting VLO reps to complete the on-line survey in a timely manner. It took more than three months with numerous reminders (emails and calls to VLO managers) to get the VLO reps to complete the survey.

At the time that the survey was closed and completed surveys tallied in late August 2017, a total of 23 VLO reps from seven VLOs had completed the survey. The questions replete with all responses are provided in Appendix C.

1.2.7 Mobile VLO

In May 2018, three WA RUC Participants expressed concern that their residence was geographical far from anyone of the eight VLOs participating in the Pilot Project. Following from discussions within the Project Team and in agreement with the WSTC, the Project Team reached out to the three Participants via email and telephone. This contact led the Project Team to organize and meet each of the three Participants. The meetings focused on providing the same service that VLO reps were providing by using an iPhone to take pictures of their license plates and odometers.

All three meetings took place during mid-June 2018. The mobile VLO services provided had no problems during the visit and no concerns were expressed afterwards to the Project Team or the WSTC.

1.2.8 VLO meetings with Project Team

During the months of August and September 2018, the Project Team organized visits to VLOs to check-in and obtain direct feedback from VLOs concerning ongoing aspects of the WA RUC Pilot Project. At this stage of the Pilot Project, one of the eight VLOs decided to no longer participate in the pilot — they apparently lost interest as the Project Team never received return calls or texts despite numerous attempts to contact them. Also, a previously planned midpoint survey was not necessary because there were not many Participants going to the VLOs to get pictures taken of their license plate and odometers. It should be noted that the Project Team did not focus on indicating to the VLOs that they could expect a prescribed number of Participants coming into their offices for taking pictures and uploading them. Rather, the Agreement put in place for each VLO focused primarily on the number of VLO reps participating in training, attending the mid-term check-in meeting, and completing the two surveys.

1.2.9 Closeout Activities

In December 2018, as the WA RUC Pilot Project approached its planned end date (January 31, 2019), the Project Team developed and sent several emails to VLOs in order to:

- ▶ Inform VLOs that the Pilot Project was close to wrapping up
- ▶ Thank them for their support throughout the Pilot Project operational phase
- ▶ Schedule individual VLO closeout meeting (after January 31, 2019)
- ▶ Plan for administering and collecting results of Survey #2
- ▶ Collect the transaction log to determine the number of Participants who visited the VLOs to take pictures of their license plate and odometer reading.

The original plan for administering and compiling results of this survey entailed the same approach as for the first survey, i.e. provide each VLO rep with a nominative weblink so they could go on-line to complete the survey at their leisure. However, due to the length of time it took to complete the first survey by some VLO reps (more than 3 months), the Project Team decided to administer the surveys using printed copies during the on-site closeout meetings.

When travelling to the scheduled meetings with some Vehicle Licensing Offices, mother nature made it very difficult to reach some of the VLOs as planned for closeout meetings and administering the survey. This led to several VLOs closing early or cancelling

meetings due to inclement weather conditions. In addition, some VLOs were swamped with customers at the scheduled meeting time. To accommodate these varying situations, some on-site closeout meetings were spontaneously modified such that:

- ▶ Four VLOs ended up taking paper copies of the second survey to complete by their representatives at a later time and send to the Project Team after the meeting.
- ▶ Two VLOs completed the surveys during the on-site closeout meetings as planned.
- ▶ One VLO took part in the closeout meeting but never returned the completed surveys despite numerous email and text message reminders.

Upon receipt of the completed questionnaires, the Project Team uploaded all completed responses verbatim.

This survey had a total of 20 questions covering four categories:

- ▶ Warm up and Training
- ▶ Providing WA RUC Pilot Project services
- ▶ Benefits to VLOs
- ▶ General feedback.

At the time that completed surveys were tallied, 19 VLO representatives from six VLOs had completed the second survey. The questions replete with all responses are provided in Appendix D.

The transaction log for each of the seven participating VLOs was collected as part of the closeout meetings in order to determine the number of Participants who visited the VLOs to take pictures of their license plate and odometer. The transaction logs collected did not include the Mobile VLO visits.

During the 12-month WA RUC Pilot Project, the following breakdown presents the number Participants who sought help to take pictures of their license plate and odometer reading:

▶ Number of Participants who visited VLOs:	117
▶ Number of Participants received Mobile VLO support:	3
▶ Total number of Participants who sought help:	120

1.3 Remuneration of VLOs

During the 12-month WA RUC Pilot Project, the Vehicle Licensing Offices received financial compensation for their involvement at three key junctures:

- ▶ Following onboarding activities including on-site training:
 - > VLOs received \$75 per VLO rep who participated in the training.
 - > All eight VLOs participated in on-site training and were remunerated accordingly.
- ▶ After the midpoint check-in and completion of on-line Survey #1:
 - > VLOs received \$50 per completed survey.
 - > VLOs also received \$50 per VLO rep who attended the check-in meeting and discussion.
 - > Seven of eight VLOs completed surveys, had check-in meetings and were remunerated accordingly.
- ▶ Following successful completion of closeout activities:
 - > VLOs received \$5 per transaction noted on the individual transaction logs.
 - > VLOs also received \$100 per VLO rep who completed the second survey.
 - > Lastly, VLOs received an additional \$1000 for successful completion of all agreed WA RUC Pilot Project related activities.

1.4 Structure of Report

This report includes the following chapters and appendices:

- ▶ Chapter 2 presents key results of the onboarding survey #1
- ▶ Chapter 3 summarizes key results of closeout survey #2
- ▶ Appendix A presents documents distributed during first meetings with Vehicle Licensing Offices (recruitment phase)
- ▶ Appendix B provides the presentation delivered to VLO reps during on-site training and the User Manual
- ▶ Appendix C presents questions and results for Survey #1
- ▶ Appendix D presents questions and results for Survey #2.

2 Key Results of Onboarding Survey

2.1 Overview

This survey comprised a total of 16 questions covering four categories:

- ▶ Warm up (2 questions)
- ▶ Training (5 questions)
- ▶ Providing WA RUC Pilot Project services (7 questions)
- ▶ General feedback (2 questions).

The summary of results presented below is based on surveys completed by 23 individual VLO reps from seven participating Vehicle Licensing Offices. See Appendix C for questions and responses for the first survey.

2.2 Key Results

2.2.1 Warm Up and Training

This section focused on how much the VLO reps knew about the WA RUC Pilot Project and how well the on-site training and user manual were useful. Key results include:

- ▶ Publicity of WA RUC Pilot Project reached almost 50% of the VLO reps, who were familiar with the concept of road usage charging before the WA RUC pilot
- ▶ More than 80% of the VLO reps indicated that the on-site training and the user manual were either essential or very important in preparing them to support participants with submitting their odometer readings.

2.2.2 Providing WA RUC Pilot Project Services and General Feedback

This section provides a summary of feedback from VLO reps on the first round of Participants they provided support for submitting their odometer readings. Key results include:

- ▶ All 23 VLO reps had provided support to at least one Participant.
- ▶ All but 2 VLO reps felt comfortable assisting participants and answering questions.

- ▶ The method of using the MVerity App for taking and uploading pictures worked well for most VLO reps with one interesting comment:
 - > “Sometimes the software works and sometimes it doesn't, usually we have to restart the phone in order to have the app work again but even sometimes that doesn't work. I'd like to see a more reliable app produced or this one have its bugs worked out.”
- ▶ Most VLO reps (20 out of 23) indicated that the level of support from the WA RUC Pilot Team was either good or excellent.
- ▶ The User Manual provided information on contact for issues regarding Participants and Technical aspects. All but 5 VLO reps indicated that they knew who to contact in both instances.
- ▶ Several VLO reps provided ideas on how to improve the Participant experience when they visit a VLO:
 - > “Would be nice if customers could take the pictures on their phone.”
 - > “Having the customer enter a phone number and the app should pull up their information rather than have them enter all their information every time.”

3 Key Results of Closeout Survey

3.1 Overview

This second survey comprised a total of 20 questions covering four categories:

- ▶ Warm up and Training (8 questions)
- ▶ Providing WA RUC Pilot Project services (7 questions)
- ▶ Benefits to VLOs (2 questions)
- ▶ General feedback (3 questions).

The summary of results presented below is based on surveys completed by 19 individual VLO reps from six VLOs. See Appendix D for the questions and responses.

3.2 Key Results

3.2.1 Warm Up and Training

Like for the first survey, this section focused on how much the VLO reps knew about the WA RUC Pilot Project and how well the on-site training and user manual were useful.

Key results include:

- ▶ Most VLO reps (12 out of 19) were not at all familiar with road usage charging before the WA RUC Pilot and on-site training.
- ▶ After the training and during the 12-month pilot, all VLO reps (18 of 19 responded) indicated they were either somewhat or very familiar with the concept of road usage charging.
- ▶ All but 3 VLO reps (16 out of 19) indicated that this experience helped them individually become more familiar with the concept of road usage charging.

Comments from VLO reps:

- > “It made me very aware of the taxes I pay at the pump. Things that I didn't pay attention to and took for granted...now mattered”
- > “It educated me. I learned more about gas tax and actual usage expense.”
- > “Now nice and it was easy to report.”
- > “Program was easy to follow and set up good.”
- ▶ The User Manual and Transactions Log provided for reference and use during the 12-month pilot were considered easy to use by all VLO reps who indicated that they had actually used or referred to both during the pilot.

3.2.2 Providing WA RUC Pilot Project services

This section provides feedback from VLO reps on providing odometer reading services to Participants and support from the WA RUC Project Team. Key results include:

- ▶ All but 2 of 19 VLO reps reported they provided odometer reading services to at least one Participant.
- ▶ All but one VLO rep felt comfortable assisting Participants and answering their questions. Comments about answering questions confirmed these results:
 - > “Everyone I dealt with was friendly and happy to participate. Eager to be part of the pilot program.”
 - > “People knew what they were into for the most part. No questions were asked that I could not answer.”
 - > “Any questions asked we were able to answer.”
- ▶ The method of using the MVerity App for taking and uploading pictures worked well for most VLO reps with several comments worthy of further consideration:
 - > “Maybe when you take the picture the app auto fills the mileage.”
 - > “But the camera would not work sometimes. Took awhile to load sometimes.”
 - > “iPhone worked about 70% of the time.”
- ▶ All but one VLO rep (18 out of 19) indicated that the level of support from the WA RUC Pilot Team was either good or excellent. Comments from VLO reps included:
 - > “Any questions we had or assistance needed was answered immediately.”
 - > “I didn’t have question on the side of agent but I did as a participant on the consumer side. My questions were answered quickly and efficiently.”
 - > “They could not help with the issues we were having.”
 - > “[Project Team Member] was awesome, easy to work with and fun.
 - > “Great easy to work with.”

3.2.3 Benefits to VLOs and General Feedback

This section summarizes a few questions about potential benefits to Vehicle Licensing Operations and general feedback. Key results include:

- ▶ Most VLO reps (15 out of 19) indicated that providing services at \$5 per transaction is a fair fixed fee per transaction in comparison to other vehicle licensing fees they currently have in place.

- ▶ A few VLO reps provided interesting comments to back up their reaction with two comments about this NOT being sufficient:
 - > “We need to collect information for DOL/DOR/DOT. It's a lot of departments for \$5.”
 - > “Inflation causes everything to go up for licensing fees. The DOL fees should be more fair based on inflation.”
 - > “It paid for the time of the employee.”
 - > “Fair fee.”
 - > “This fee was appropriate for the time it required.”
- ▶ Concerning a hypothetical question about a future system that includes VLO support for submitting odometer readings as an additional source of work and revenue, 18 of 19 VLO reps believe that this would be of interest to their vehicle licensing operations. A few illustrative comments include:
 - > “We enjoyed engaging with the participants. We went out to the vehicles and took odometer picture and it allowed us to spend time with them.”
 - > “It was fun communicating with customers. Hearing their feedback. Looked forward to next reading.”
 - > “It was easy to do. It's right up our alley and works well within our system.”
 - > “If an increase of fees were to given to office.”
 - > “If we get compensation for the additional work.”
- ▶ Several VLO reps provided ideas on to improve the process for submitting odometer readings that merit further consideration:
 - > “Entry into DRIVES, links to WA RUC. Possibly a system linking (similar to emissions) to communicate between systems.”
 - > “Auto inputs the mileage when you take the picture.”
 - > “We could enter at time of renewal.”
- ▶ Several VLO reps had comments and ideas on the Participant experience when they visit a VLO:
 - > “Customer did suggest when logging in if system could remember their info they had to re-enter name/email and the pics of plates/odo.”
 - > “More information could be provided to both the common people and the VLO participants.”
 - > “Feel it went smoothly and would be willing to help out with WA RUC projects if need be.”
 - > “I think it went great and was really straightforward.”

Appendix A: Documents for First Meetings with VLOs

A.1 Fact Sheet for the Washington Road Usage Charge Pilot Project

TEST DRIVE THE ROAD AHEAD

WASHINGTON ROAD USAGE CHARGE PILOT PROJECT

Summer/Fall 2017

WHAT IS A ROAD USAGE CHARGE?

After several years of study, the Washington State Transportation Commission will test a pay-per-mile tax system called a road usage charge beginning in early 2018. A road usage charge asks drivers to pay for the miles they drive in Washington, instead of paying tax by the gallons of gas they use. **The pilot will be a unique opportunity for Washington drivers to inform the future of transportation funding in Washington.**

WHY PARTICIPATE?

We need a diverse set of Washington drivers to help test a road usage charge. Their input will help ensure a potential future implementation is fair and practical. Participants will be recruited from all over Washington, as well as those who frequently drive into Washington from places like British Columbia, Oregon, and Idaho.

Pilot Project Schedule

2017

Summer/Fall

Recruitment

- Recruit volunteer drivers
- Outreach to general public
- Test pilot system

Winter

Selection

- Select final participants
- Set up participant accounts

2018

Winter

Launch

- Pilot launches early 2018

LOOKING FOR

WASHINGTON DRIVERS

FROM ALL OVER THE STATE

WHAT PARTICIPANTS CAN EXPECT

- 2,000 DRIVERS** selected
- 10 MINUTES A MONTH** average commitment for 12 months
- 4 MILEAGE REPORTING OPTIONS** from no-tech to high-tech

INTERESTED IN PARTICIPATING?

Participation in the pilot project is free. Visit waroadusagecharge.org to sign up and receive email updates, including notification when recruitment begins.

MORE INFORMATION

info@waroadusagecharge.org
waroadusagecharge.org

1-833-WASH-RUC (833-927-4782)

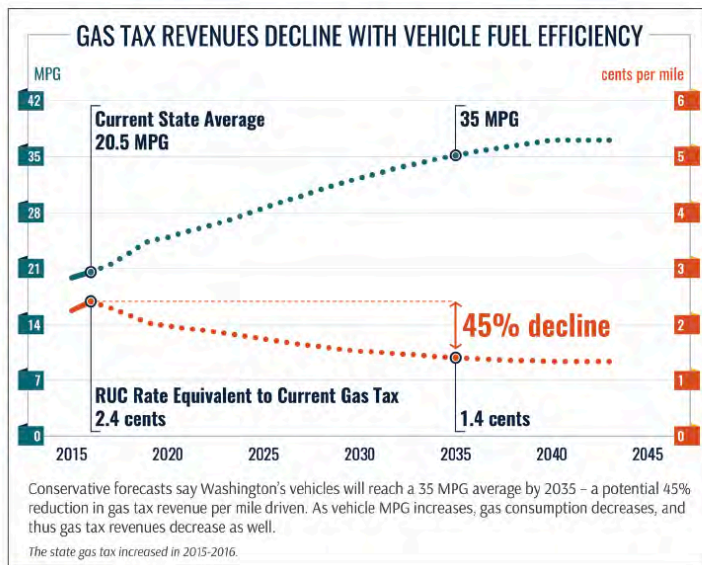
360-569-1999
509-600-0999

FREQUENTLY ASKED QUESTIONS

Why is Washington conducting the pilot?

To ensure sustainable, long-term funding: As vehicles become more fuel efficient, gas consumption goes down. With a decline in gas consumption comes reduced gas tax revenues needed for our roads, bridges, and ferry system. A road usage charge could provide a more stable source of transportation funding than the gas tax, since drivers would pay by the mile instead of by the gallon.

To ensure everyone pays their fair share: Considering the range of MPG of today's vehicles on the road, the gas tax has become inequitable. For the same miles driven, drivers pay widely different amounts for their roadway use, depending on their vehicle's MPG. This inequity is expected to grow each year as vehicle MPG continues to increase.



Will the road usage charge be an additional tax?

The road usage charge is being considered as a **replacement to the gas tax**, not on top of or in addition to the gas tax. During a transition time where the gas tax would coexist with the road usage charge, drivers would pay one or the other but not both.

Is a road usage charge unfair compared to the gas tax?

No. A road usage charge system would tax everyone at the same rate per mile driven on public roads in Washington regardless of a vehicle's MPG. Today, people who use vehicles with lower MPG pay more gas tax because they purchase more gas as compared to drivers of high MPG vehicles (over 20 MPG).

What happens if I drive out of state?

In a future road usage charge system, the intent is that drivers would only pay for miles they drive in Washington. The pilot will help us determine how drivers would best record mileage in and out of Washington state.



WANT TO LEARN MORE?
waroadusagecharge.org

A.2 Presentation by Washington State Transportation Commission Executive Director, Reema Griffith

WASHINGTON STATE ROAD USAGE CHARGE
Pilot Project

Washington State Transportation Commission
Reema Griffith
Executive Director
Washington State Transportation Commission

TODAY'S PRESENTATION

Problem

- Gas Tax Breakdown
- Future funding gap

Potential solution

- Road usage charge

Pilot project

- Help us design a solution

WA RUC 2

Gas Tax Breakdown

49.4¢ PER-GALLON STATE FUEL TAX

- 9.5¢ 2011 Transport Solutions Partnership projects**
5¢ High-Road projects
11.9¢ Connecting, Washington
11¢ Cities need counties, local roads
4¢ Pay off bonds funded by pre-2003 fuel tax

= 8¢ Available for use on state highways, bridges and ferries
• maintenance and operations
• preservation
• safety improvements

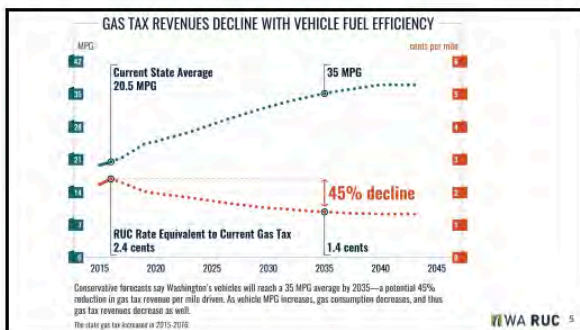
* Of the 9.5¢, 8.5¢ is used by the state for highway projects, 1¢ goes to cities and counties for street and road improvements.
** The 11.2¢ gas tax increase was phased in over two years - a 7¢ cent increase on 6/2/2015, and a 4.5¢ increase on 7/2/2016.

WA RUC 3

Fuel Efficiency Bar Continues to Rise

- Current federal CAFE Standards: **54.5 MPG by 2025**
- Washington state's current average: **20.5 MPG**
- The Federal Energy Information Administration conservatively predicts:
 - All **NEW** cars by 2040 = **48 MPG**
 - All cars (**new and old**) by 2040 = **37 MPG**

WA RUC 4



The Road Usage Charge Emerges


- A road usage charge is a **per mile charge** drivers would pay for the use of the roads, rather than paying by the gallon of gas
- Similar to how we pay for utilities, such as electricity or water
- Identified as a viable future funding source in need of further exploration

WA RUC 6

Road Usage Charge, A Potential Solution

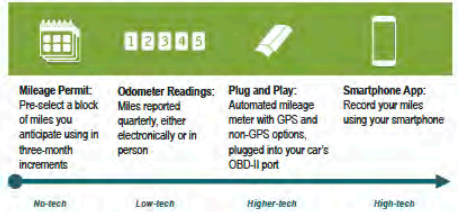
Washington is not alone:

- 14 western states are involved in research, testing, or legislatively enacted programs
- Remaining task: let the public (volunteer participants) "test drive" RUC through a live pilot test
- On August 28, 2016, FHWA awarded Washington a \$3.847 million grant to prepare for a live pilot test



WA RUC 7

Four Options To Test and Get Feedback



WA RUC 8

New Technologies Enhance Privacy and Increase Convenience

Emerging technologies show potential for reliably and easily collecting mileage data while protecting drivers' privacy.

- Mobile phone app-based solutions are emerging – works for every vehicle
- Rely on consumers' own mobile phone and vehicle odometer
- VIN and odometer photo captured and transmitted with driver's phone
- Data is extracted and validated using photo recognition technology, algorithms, and databases
- System can detect fraud



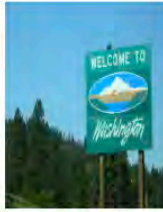
WA RUC 9

Out-of-State Drivers

Need to be able to charge people from out of state for use of roads.

- Keep the gas tax in place as a parallel system to the road usage charge
- Drivers will pay either the gas tax or the road usage charge – but not both

To distinguish between travel on Washington public roads and other roads (e.g., outside the state and private roads), location based technology will likely be needed.



WA RUC 10

Statewide Pilot test, with recruiting focused in 5 regions


Up to 2,000 vehicles from anywhere in Washington may participate

- Outreach efforts and participant support will be focused in five regions, to ensure geographic diversity in the Washington pilot test
- A small pool of participants from Surrey, BC will test the international border crossing
- A small pool from Vancouver, WA who commute into Portland, OR will test interoperability between the two states
- Four payment options will be tested from no-tech to high-tech



WA RUC 11

Pilot Project Timeline



WA RUC 12

Recruiting Participants

Unique opportunity to shape future funding options

- Help us explore what works and what doesn't

Need up to 2,000 volunteers throughout Washington – no cost to participate

You can help by:

- Signing up to participate
- Encouraging your friends and neighbors to sign up

 WA RUC 1.4



Sign up today!
Be a part of shaping our state's future.

info@waroadusagecharge.org
(833) WASH-RUC

www.waroadusagecharge.org 

CONTACT INFORMATION

Reema Griffith, Executive Director
Washington State Transportation Commission
griffir@wstc.wa.gov
360-705-7070

Consultant support provided by:



 WA RUC 1.5

A.3 Role for VLOs in the Pilot (PowerPoint presentation)

WASHINGTON STATE ROAD USAGE CHARGE

Role for Department of Licensing Subagencies in the Pilot

Steve Morello
D'Artagnan Consulting

December 2017

Washington State Department of Licensing
Washington State Department of Transportation

Contents

- Objectives and Approach
- Roles in Pilot
- How it Works
- MVerity Web App
- Training
- Support for Subagencies and Participants
- Subagency Incentives and Compensation
- Outreach and Engagement
- Schedule

WA RUC 2

Objectives and Approach

- Support the pilot program undertaken by the Washington State Transportation Commission to test various methods to gather mileage data for a per-mile road usage charge for transportation funding
- Specifically, pilot a manual reporting method for those that do not have a mobile device with a camera or prefer not to use their personal mobile device for privacy reasons
- Gather feedback from participants on the process
- Gather feedback from DOL subagents on the process
- Collect data to gauge cost of administering the system

WA RUC 3

Provided Technology: MVerity WA RUC DOL Subagent Web App

- D'Artagnan will provide an Apple iPhone for each subagent's use in the pilot
- Customized MVerity WA RUC DOL subagent web app
- All iPhones are on a cellular data plan

WA RUC 4

Key needs for Subagency in Pilot

- Have staff comfortable with operating and updating a mobile device
- Willing to provide participants a high level of customer service
- At least one staff person who will:
 - Participate in the initial training before **January 2, 2018**
 - Complete all 6 surveys over the course of 12 months (approx. 10 minutes per survey)
 - Provide WA RUC odometer reporting services to walk-in pilot participants by lending them an iPhone to enable them to submit periodic photos of their odometer mileage and license plate
 - Submit a log of walk-in Participant activity at least once per month
- Have a secure location to charge and store the iPhone when not in use

WA RUC 5

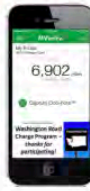
Who is involved in WA RUC Pilot

- **Pilot Participants**
 - Drivers enrolled in the WA RUC pilot
 - Set up an account and register a vehicle in their account
 - Most participants will need to periodically submit a photo of their odometer mileage and license plate
 - Can use own mobile device to submit photos or go to subagent to borrow a device to take the photos
- **WSTC:** Sponsor of RUC pilot.
- **DOL:** Holds contracts with County Auditors
- **WA County Auditors**
 - Hold contracts with DOL subagents to operate vehicle/vessel license subagencies
- **Project Team**
 - Pilot oversight
 - Implement DOL subagent plan
 - Contract and train subagents
 - Evaluate subagent process

WA RUC 6

How it works for Participants


- Participant receives notification from the WARUC team to submit odometer reading
- Participant walks into subagency and asks to get their odometer read for the WA RUC pilot
- Subagent logs participant in and hands Participant an iPhone provided to photograph odometer and license plate
- Participant takes iPhone to car, takes pictures of their odometer and license plate with iPhone and submits the two pictures via a web app
- Participant returns iPhone and checks out with subagent



WA RUC 7

How it works from perspective of Subagent (1 of 2)


- Participant walks in and asks to get their odometer read for the WA RUC pilot
- Subagent logs the Participant request in a WA RUC transaction log (either paper or Excel, TBD)
- Subagent retrieves fully-charged iPhone from storage place
- Subagent opens the web browser and goes to the bookmarked web app URL (Participant observes)
- Subagent types in Participant's first name, last name, email address, and phone number



WA RUC 8

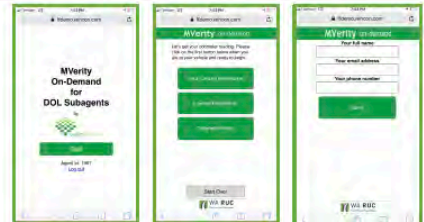
How it works from perspective of Subagent (2 of 2)

- Subagent explains to Participant how to take and submit the pictures and provides lends iPhone to Participant
- When Participant returns with the iPhone, the subagent checks that the two pictures were successfully submitted via the web app
- If a photo/image was not successfully submitted, subagent informs the Participant and troubleshoots together: (a) No internet connectivity (b) Photos not taken (c) Photos stored on iPhone instead of submitted to app (subagent will assist with submitting them) (d) Send Participant back to their vehicle to take photos
- Subagent logs the end of the transaction and notes any issues or feedback regarding the process or interaction



WA RUC 9

Provided Technology: MVerity WA RUC DOL Subagent Web App



WA RUC 10

MVerity WA RUC DOL Subagent Web App – Walkthrough (1 of 2)



WA RUC 11

MVerity WA RUC DOL Subagent Web App – Walkthrough (2 of 2)



- Once data entered and photos are submitted, system attempts to automatically process images and match to an account by license plate and customer name
- Once matched, data is posted to customer's account
- If a match could not be found, service provider will contact customer via email or phone

WA RUC 12

Training

D'Artagnan prepares and undertakes training

- Subagent's user manual distributed to subagents
- Provide iPhones for subagents' training
- Conduct subagents' training



Training will include:

- RUC background
- RUC pilot basics
- Identify WA RUC participants and check-in
- Accessing web app on iPhone
- How to provide instructions to participants
- Verifying successful odometer reading submission
- Check-out of WA RUC participants
- Troubleshooting
- Where to get help and support

WA RUC 13

Support for Subagents and Participants

Type of Help	Subagents	Participants
Main support	WA RUC Help Line	Their service provider (emovis) customer service
WA RUC Help Line support for	Triage, including: <ul style="list-style-type: none"> • Device theft and loss • Device malfunction claims 	Participants who do not know who their service provider is
Compensation Questions and Issues	D'Artagnan point of contact	Not Applicable
Submission of Logs and Surveys	D'Artagnan point of contact	Respond to online pilot participant surveys

WA RUC 14

Outreach and Engagement with Subagents

Materials D'Artagnan will provide to volunteering subagents:

- Step-by-step instructions for both
 - Subagents
 - Participants
- Surveys - Developed by D'Artagnan for subagents
 - Opportunity for subagents to provide feedback on the process and issues encountered



WA RUC 15

Target Schedule of Subagency Partnerships

Activity	Date	Responsibility
Subagencies agree and finalise their participation	December 7 - 11	Agreements completed between D'Artagnan and subagencies
Train selected subagencies' staff on-site	December 12 - 21	D'Artagnan to bring iPhone, perform training, provide manual, and handouts for subagents
WA RUC pilot live	Early January - December 31, 2018	Participants asked to submit their odometer reading

NOTE: Dates are 2017 unless noted otherwise

WA RUC 16

Sign up today!
Be a part of shaping our state's future.

info@waroadusagecharge.org
(833) WASH-RUC

www.waroadusagecharge.org

WA RUC

Contact Information

Steve Morello
Partner

D'Artagnan Consulting

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(571) 535-0600

WA RUC 18

Appendix B: Training Module and User Manual for VLOs

B.1 On-site Training Module

Contents

- Background for Road Usage Charging
- WA RUC Pilot Project Basics
- How it Works – Identify WA RUC Participants and check-in/check-out
- Where to get Help and Support

WA RUC 3

Background for Road Usage Charging

WA RUC 3

Current Gas Tax Breakdown

49.4¢ PER-GALLON STATE FUEL TAX

9.5¢	5¢	11.9¢	11¢	4¢
421 PROJECTS	ROADWAY IMPROVEMENTS	ROADWAY IMPROVEMENTS	ROADWAY IMPROVEMENTS	ROADWAY IMPROVEMENTS

= 8¢

Problem: Gas Tax won't fund future needs and financial commitments

WA RUC 4

By 2027, 77% of State Gas Tax Revenues will go to debt service payments*

WA RUC 5

The Fuel Efficiency Bar Continues to Rise

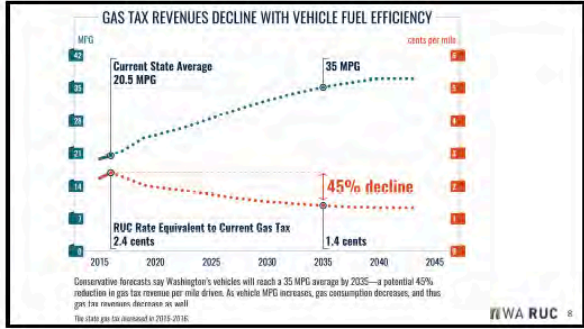
- Current federal CAFE Standards: **54.5 MPG by 2025**
- Washington state's current average: **20.5 MPG**
- The Federal Energy Information Administration conservatively predicts:
 - All **NEW** cars by 2040 = **48 MPG**
 - All cars (**new and old**) by 2040 = **37 MPG**

WA RUC 6

The Fuel Efficiency Bar Continues to Rise

- Auto manufacturers are setting the transition pace:
 - Volvo plans to produce only hybrid and electric cars starting in 2019
 - Toyota 2017 Mirai - powered by hydrogen fuel cell with an EPA rated 312-mile range. Plans to shift to hydrogen fuel cell fleet in the next 15+ years
 - Ford is investing \$4.5 B to transition to hydrogen fuel cell and other alternative fuels over the next 15+ years
 - Nearly 400,000 people put down a \$1,000 deposit for Tesla's all electric Model 3

WA RUC 7



Potential Solution: Road Usage Charge Emerges

- A road usage charge is a **per mile charge** drivers would pay for the use of the roads, rather than paying by the number of gallons of gas consumed
- Similar to how we pay for utilities, such as electricity or water
- Identified as a viable future funding source in need of further exploration

WA RUC 9

Road Usage Charge, a Potential Solution

- Washington is **not alone**:
 - 14 western states are involved in research, **testing**, or **legislatively enacted programs**
 - Remaining task: let the public (volunteer participants) "test drive" RUC through a live pilot test
 - On August 28, 2016, FHWA awarded Washington a \$3.847 million grant to prepare for a live pilot test

WA RUC 10

Road Usage Charge Assessment

Since 2012, the Washington State Transportation Commission has led this work with a 25-member steering committee comprised of diverse stakeholders

Three Commissioners – One serves as Chair

Eight Legislators – four Senators and four Representatives

Representatives from:

- Auto and light truck manufacturers
- Ports
- Environmental
- Counties
- Trucking industry
- Cities
- Public transportation
- Consumer/Public
- WSDOT
- Department of Licensing
- Motoring public
- Business
- User fee technology
- Treasurer's Office

WA RUC 11

The Basis of the Assessment

Identify a sustainable, long-term revenue source for Washington State's transportation system, and transition from the current gas tax.

- Ensure there is consumer choice on how mileage information can be collected and paid for
- During the transition period of moving from the gas tax to a road usage charge, drivers would pay one or the other, but **never both**
- For purposes of assessing the gas tax against a road usage charge, we have assumed revenue neutrality and focused on net revenue potential for both

WA RUC 12

Four Options to Test and Evaluate

Option	Technology Level	Description
Mileage Permit	No-tech	Pre-select a block of miles you anticipate using in three-month increments
Odometer Readings	Low-tech	Miles reported quarterly, either electronically or in person
Plug and Play	Higher-tech	Automated mileage meter with GPS and non-GPS options, plugged into your car's OBD-II port
Smartphone App	High-tech	Record your miles using your smartphone

WA RUC 13

New Technologies Enhance Privacy and Increase Convenience

Emerging technologies show potential for reliably and easily collecting mileage data while protecting drivers' privacy.

- Mobile phone app-based solutions are emerging – works for every vehicle
- Rely on consumers' own mobile phone and vehicle odometer
- VIN and odometer picture captured and transmitted with driver's phone
- Data is extracted and validated using picture recognition technology, algorithms, and databases
- System can detect fraud

WA RUC 14

Statewide Pilot Project with Recruiting Focused in 5 Regions

Up to 2,000 vehicles from anywhere in Washington will participate

- Outreach efforts and participant support focused in five regions, to ensure geographic diversity in the Washington pilot test
- A small pool of participants from Surrey, BC will test the international border crossing
- A small pool from Vancouver, WA who commute into Portland, OR will test interoperability between the two states
- Four payment options will be tested from no-tech to high-tech

WA RUC 15

Pilot Project Timeline

Year	Season	Activity
2017	Spring/Summer	Pilot project final development
2017	Fall	Participant recruitment
2017	Winter	Participant selection
2018	Winter	Pilot test launch

WA RUC 16

WA RUC Pilot Project Basics


WA RUC 17



Summary of Pilot Project Basics for Vehicle Licensing Offices

- Support the pilot project undertaken by the Washington State Transportation Commission to test various methods to gather mileage data for a per-mile road usage charge for transportation funding
- Specifically, pilot a manual reporting method for those that do not have a mobile device with a camera or prefer not to use their personal mobile device for privacy reasons
- Gather feedback from Participants on the process
- Gather feedback from DOL Vehicle Licensing Office (VLO) Customer Service Representatives (CSRs) on the process
- Collect data to gauge cost of administering the system

WA RUC 18

Who is involved in WA RUC Pilot


- Pilot Participants**
 - Drivers enrolled in the WA RUC pilot
 - Selected an operational concept, set up an account, and registered a vehicle in their account
 - If signed up for odometer reading or mileage permit methods, then need to periodically submit pictures of their odometer reading & license plate
 - Can use own mobile device to submit pictures
 - Some participants may be from Idaho
- WSTC:** Sponsor of RUC pilot 
- DOL:** Holds contracts with County Auditors
- WA County Auditors**
 - Hold contracts with DOL VLOs to collect registration and titles for DOL vehicle/vessel licenses
- Project Team**
 - Pilot oversight
 - Implement plan for DOL VLOs
 - Contact and train CSRs
 - Evaluate process of using DOL VLOs

Roles and Responsibilities




- DOL Vehicle Licensing Offices (VLOs)**
 - Businesses that collect registration and titles for DOL vehicle/vessel licenses
 - 8 Vehicles Licensing Offices selected to participate in the WA RUC pilot
 - Role: Support Participants needing to submit periodic pictures of their odometer readings and license plate
- Vehcon (Web app developer)**
 - Vendor providing web app (browser-based program) for capture of odometer and license plate pictures
 - Staff Help Line for CSRs for app questions
- Account manager:**
 - Offer participants the option to use VLOs to take pictures
 - Updating website for CSRs
 - Provide customer service to Participants

Participants can elect to go to a participating DOL Vehicles Licensing office to borrow an iPhone with which to take and submit photos



Key Needs for Vehicles Licensing Offices in Pilot

- Several Customer Service Representatives who can and are willing to:
 - Participate in the initial training before **January 12, 2018**
 - Ready to provide excellent customer services beginning January 16, 2018
 - Complete all 6 surveys over the course of 12 months (approx. 10 minutes per survey)
 - Provide WA RUC odometer reporting services to walk-in pilot Participants by lending them an iPhone to enable them to submit periodic pictures of their odometer mileage and license plate
 - Submit a log of walk-in Participant activity on a periodic basis (depending on number of transactions each month)
- Have a secure location to charge and store the iPhone when not in use







How it Works – Identify WA RUC Participants and check-in/check-out



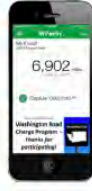

Provided Technology: MVerity Web App

- D'Artagnan will provide an Apple iPhone for use at each VLO involved in the pilot.
- Customized MVerity web app for WA RUC Pilot Project: <https://tdemo.vehcon.com/agents/>
- All iPhones are on a cellular data plan


How it works for Participants

- Participant receives notification from the WARUC team to submit odometer reading
- Participant walks into Vehicle Licensing Office and asks to get their odometer read for the WA RUC pilot
- CSR logs Participant in and hands Participant an iPhone provided to take pictures of odometer and license plate
- Participant takes iPhone to car, takes pictures of their odometer and license plate with iPhone and submits the two pictures via the web app
- Participant returns iPhone and checks out with CSR

How it works from perspective of CSR (1 of 2)


- Step 1** • Participant walks in and asks to get their odometer read for the WA RUC pilot
- Step 2** • CSR does Participant check-in via the WA RUC transaction log
- Step 3** • CSR retrieves fully-charged iPhone from storage place
- Step 4** • While Participant observes, the CSR clicks on the web clip to open the MVerity website
- Step 5** • CSR (or the Participant) types in Participant's first name, last name, email address, and phone number into the web app



WA RUC 25

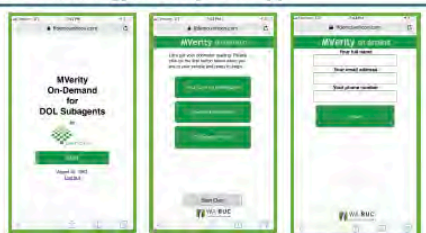
How it works from perspective of CSR (2 of 2)

- Step 6** • CSR explains to Participant how to take and submit the pictures and provides lends the iPhone to Participant
- Step 7** • When Participant returns with the iPhone, the CSR checks that the two pictures were successfully submitted via the web app
- Step 8** • If a picture was not successfully submitted, CSR informs the Participant and troubleshoots together
- Step 9** • Once pictures of the odometer and license plate are successfully submitted via web app, the CSR informs the user that they will receive a message from their service provider once the photos are processed and logs the end of the transaction



WA RUC 26

Provided Technology: MVerity Web App



MVerity Start Screen Initial Screen Participant Information Entry

WA RUC 27

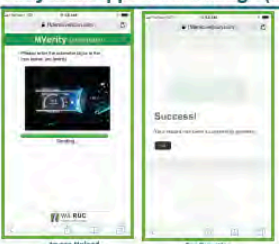
MVerity Web App – Walkthrough (1 of 2)



Odometer Capture Odometer Capture Instructions License Plate Capture Instructions License Plate Capture

WA RUC 28

MVerity Web App – Walkthrough (2 of 2)



- Once data entered and photos are submitted, system attempts to automatically process images and match to an account by license plate and customer name
- Once matched, data is posted to customer's account
- If a match could not be found, service provider will contact customer via email or phone

Image Upload Confirmation

WA RUC 29

Where to get Help and Support

WA RUC 30

Troubleshooting and Support

Type of Help	Vehicle Licensing Office and CSRs	Participants
First line of support	WA RUC Help Line 1-833-WASH-RUC 1-833-927-4782	Their service provider customer service, DriveSync 1-866-534-7241
Submission of Transaction Logs and Surveys	Triage, including: <ul style="list-style-type: none"> • Device theft and loss • Device malfunction claims D'Artagnan point of contact	All account related activity: <ul style="list-style-type: none"> • Account activity and status • Odometer requests Respond to online pilot Participant surveys
Compensation Questions and Issues	D'Artagnan point of contact	Not Applicable

WA RUC 31

Outreach and Engagement with Vehicle Licensing Offices

- Surveys - Developed by D'Artagnan for CSRs
- Opportunity for CSRs to provide feedback on the process and issues encountered



WA RUC 32

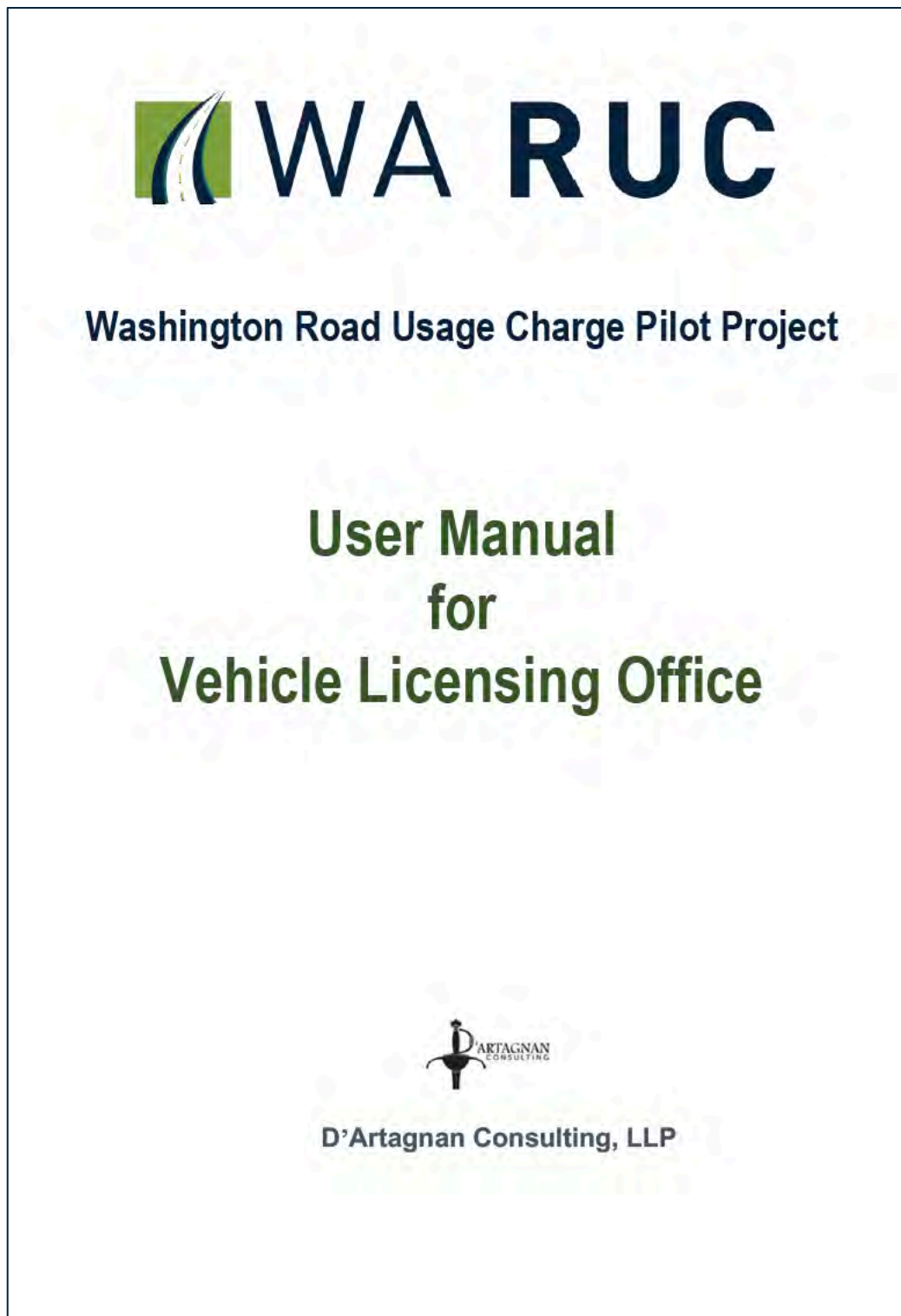
Contact Information

Steve Morello
 Partner
 D'Artagnan Consulting
steve.morello@dartagnanconsulting.com
 (571) 535-0600

WA RUC 33

B.2 User Manual for VLOs

The following pages include the User Manual as distributed to each of the VLOs in a 3-ring binder replete with log of Participants sheet (see last page of this section).



Introduction

Information provided in this packet includes the following key sections of information for the Vehicle Licensing Offices participating in the WA RUC Pilot Project:

- Instructions for Customer Service Representatives (CSRs)
- Troubleshooting and Support
- CSR Frequently Asked Questions
- Transactions Log for Vehicle Licensing Office

Instructions for Customer Service Representatives

Key steps for CSR activities from check-in to check-out of Participants

The following steps comprise the sequential instructions for CSRs:

- **Step 1: Participant walks in and asks to get their odometer read for the WA RUC pilot**
 - CSR welcomes Participant
- **Step 2: CSR does Participant check-in via the WA RUC transaction log (see section in this User Manual)**
 - CSR notes Participant name in transaction log and verifies ID
 - Check-in process completed when check in time noted on transaction log
- **Step 3: CSR retrieves fully-charged iPhone from storage place**
 - Verifies that the iPhone is operational
- **Step 4: While Participant observes, the CSR clicks on the web clip to open the MVerity website**
 - Alternative: Open Safari and go to the bookmarked web app at:
<http://mvodsub.mverity.com>
- **Step 5: CSR (or the Participant) types in Participant's first name, last name, email address, and phone number into the web app**
 - Note this information is to enable us to contact the participant should the pictures cannot be matched to their account successfully
 - Both CSR and Participant follow the on-screen prompts

- **Step 6: CSR explains to Participant how to take and submit the pictures via the iPhone's web app and lends the iPhone for Participant to take pictures of the car odometer and license plate**
 - Demonstrate how to use by taking fictive photo, if necessary
 - NOTE: CSR will have to hit cancel then and ensure it is not submitted since Participant is signed in at this point already

- **Step 7: When Participant returns with the iPhone after taking pictures of the car odometer and license plate and submitting them via the web app, the CSR checks that a text message was received verifying that the pictures were received while the iPhone was checked out**
 - CSR notes text message indicating a photo was received.

- **Step 8: If a text message was not received, CSR informs the Participant and troubleshoots together:**
 - No internet connectivity
 - Pictures not taken
 - Pictures stored on iPhone instead of submitted to app (CSR will assist with submitting them via web app)
 - Send Participant back to their vehicle to take new pictures
 - CSR aids Participant in taking pictures, if necessary to complete successful submission

- **Step 9: Once pictures of the odometer and license plate are successfully submitted via web app, the CSR:**
 - Informs the user that they will receive a message from their service provider once the photos are processed.
 - Accepts the return of the iPhone
 - Logs the end of the transaction

Washington Road Usage Charge Pilot Project
User Manual for Vehicle Licensing Office



- Deletes any pictures remaining on the iPhone
- Returns the iPhone to the storage place for recharging
- Notes any issues or feedback regarding the process or interaction

Troubleshooting and Support

The following table provides an overview of options for troubleshooting and support for CSRs and Participants to help resolve issues that may arise.

Type of Help	Vehicle Licensing Office and CSRs	Participants
First line of support	WA RUC Help Desk 1-833-WASH-RUC 1-833-927-4782	Their service provider customer service, DriveSync 1-866-534-7241
	Triage, including: <ul style="list-style-type: none"> • Device theft and loss • Device malfunction claims 	All account related activity: <ul style="list-style-type: none"> • Account activity and status • Odometer requests
Submission of Transaction Logs and Surveys	D'Artagnan point of contact	Respond to online pilot Participant surveys
Compensation Questions and Issues	D'Artagnan point of contact	Not Applicable

Frequently Asked Questions

This section is broken into two types of frequently asked questions (FAQs):

- FAQs for CSRs:
 - There are likely a number of issues/questions that may arise specific to a Participant coming to a Vehicle Licensing Office.
 - This section provides potential issues/questions with proposed response.
- Official WA RUC Pilot Project FAQs that are public on the WA RUC website (<https://waroadusagecharge.org>).

FAQs for CSRs

Why did I have to come to this Vehicle Licensing Office to get my pictures?

ANSWER: This service has been made available for those that prefer not to or do not have the option to use their own cameras or phones to take pictures and submit their odometer readings. You can use this service to submit a single odometer reading or to submit all of your readings during the pilot. If after submitting your odometer reading you feel comfortable with using your own smartphone for future odometer readings, you certainly can do so!

How often do I have to come here?

ANSWER: Odometer pictures are required at the start and end of the project. If you are on the mileage permit, odometer read, or Mile Mapper methods, pictures will also be needed every quarter (three months). You will receive an odometer reading request by text or email when it is needed. Other mileage reporting methods do not require any additional periodic reads.

How does this work? I don't know how to use a smartphone (or a web app).

ANSWER: We will loan you an iPhone so that you can take it out to your car to take pictures. The process has been designed to be as simple as possible so that you should be able to do this even if you are not very familiar with how to use an iPhone. We are here for any questions you may have and you can also call your service provider at any time in the process to have them help walk you through the process. Please feel free to take the iPhone out to your vehicle, take a couple pictures of your license plate and odometer and bring it back here. We can help you submit the pictures through the web app.

Washington Road Usage Charge Pilot Project
 User Manual for Vehicle Licensing Office



Can you help me take the pictures?

ANSWER: Sorry, our business policies does not allow us to leave our stations unmanned. If you have trouble, please feel free to take the iPhone out to your vehicle, take a couple pictures of your license plate and odometer and bring it back here. We can help you submit the pictures through the web app.

Sorry but I dropped the iPhone and broke it; do I have to pay for a replacement?

ANSWER: Thank you for reporting this. The iPhone is insured for damage. However, we will need to file a claim with the project. Can you please leave your name and contact information in case we need more information to complete the claim?

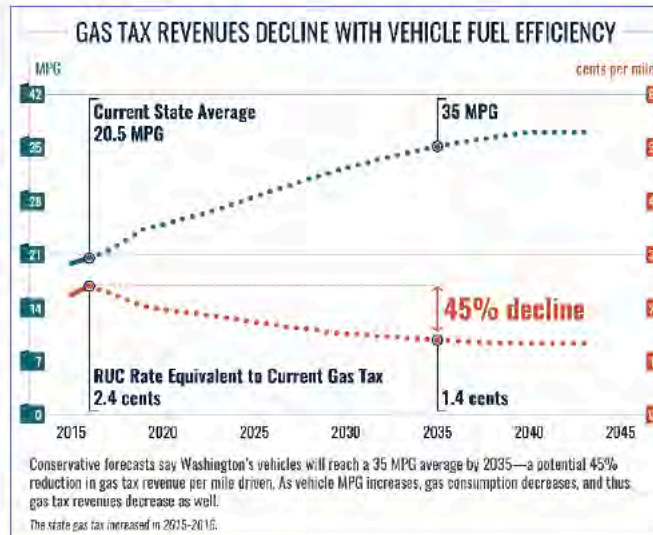
Official WA RUC Pilot Project FAQs

What is a road usage charge?

ANSWER: A road usage charge is a per-mile charge drivers would pay based on how much they use Washington’s road system rather than pay by the gallons of gas they buy. This approach is similar to how people pay for their utilities, including electricity or water.

Why is Washington studying a road usage charge system?

ANSWER: **To ensure sustainable, long-term funding:** As vehicles become more fuel efficient, gas consumption goes down. With a decline in gas consumption comes reduced gas tax revenues needed for our roads, bridges, and ferry system. A road usage charge could provide a more stable source of transportation funding than the gas tax, since drivers would pay by the mile instead of by the gallon.



Washington Road Usage Charge Pilot Project
 User Manual for Vehicle Licensing Office



To ensure everyone pays their fair share: Considering the range of MPG of today’s vehicles on the road, the gas tax has become inequitable. For the same miles driven, drivers pay widely different amounts for their roadway use, depending on their vehicle’s MPG. This inequity is expected to grow each year as vehicle MPG continues to increase.

Will this be an additional tax?

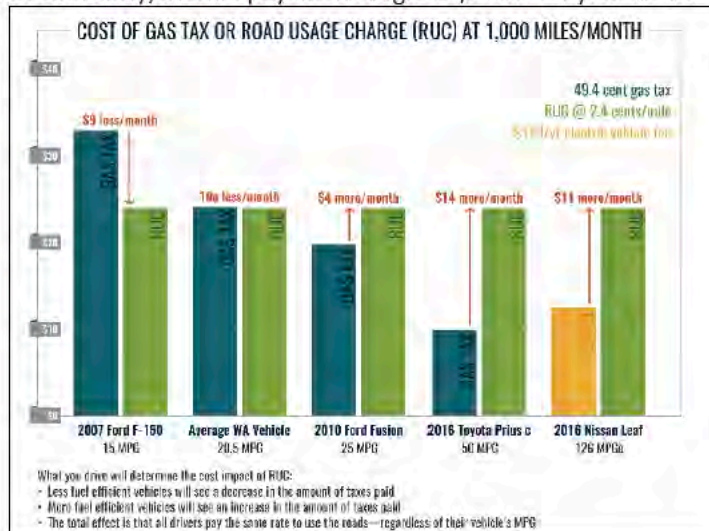
ANSWER: The road usage charge is being considered as a **replacement to the gas tax**, not on top of or in addition to the gas tax. During a transition time where the gas tax would coexist with the road usage charge, drivers would pay one or the other but not both.

Will the road usage be a flat rate?

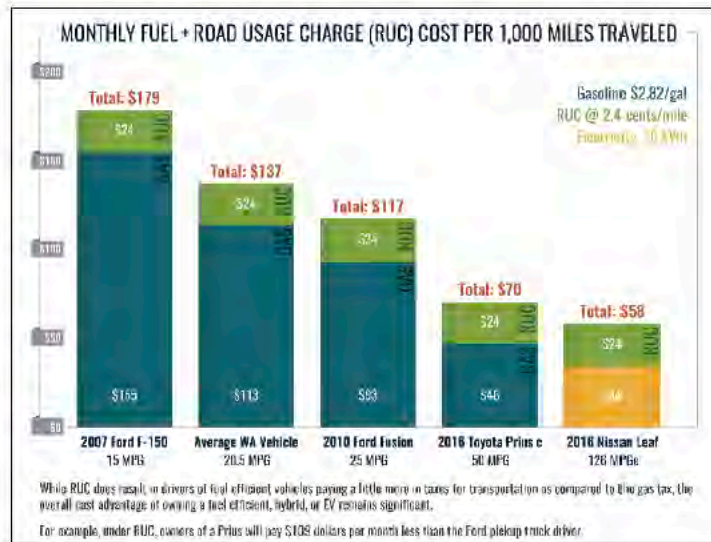
ANSWER: For purposes of the road usage charge pilot, we will utilize a 2.4 cents per mile mock charge across all vehicles statewide, which is equivalent to what the average car (20.5 mpg) in our state currently pays under the 49.4 cent per gallon gas tax. No real payments will be made in the pilot.

How much will a road usage charge cost me each year?

ANSWER: Assuming the average vehicle per year travels 12,000 miles, this breaks down to 1,000 miles traveled per month. If we apply the road usage charge pilot’s rate of 2.4 cents per mile, this equates to a total of \$24 per month, or \$288 on an annual basis. Currently, drivers pay an average of \$289.17 a year under the gas tax.



Washington Road Usage Charge Pilot Project
 User Manual for Vehicle Licensing Office



What happens if i drive out of state?

ANSWER: In a future road usage charge system, drivers would only pay for the miles they drive in Washington. The pilot will help us determine how drivers would best record mileage in and out of Washington state.

One way that drivers can ensure they are not charged for miles driven out of state is by selecting the GPS-enabled “mileage meter” or smartphone app options for reporting miles. These two options utilize GPS to ensure drivers are only charged for miles they drive in Washington. The State of Washington will not store or record specific location data, only the total number of miles driven in state.

During the pilot, drivers who use the “low-tech” or “no-tech” options would not be able to distinguish miles driven in or out of state.

Can miles be reported without using GPS data?

ANSWER: Yes. Pilot project participants will get to pick how they record their mileage from four options: a mileage permit, odometer readings, an automated mileage meter, or smartphone app. Each of these methods will require a different mechanism for recording and reporting data. The mileage permit and odometer reading approaches do not require any technology or GPS to utilize.

Washington Road Usage Charge Pilot Project
User Manual for Vehicle Licensing Office



What is a pilot project?

ANSWER: This road usage charge pilot project is a small-scale, short-term study that will help decision makers learn whether and how a concept might work in Washington. The pilot process allows the Washington State Transportation Commission and lawmakers improve upon the design or policies prior to potentially launching a larger-scale project.

Will I have to make any payments to participate in the Washington State Road Usage Charge pilot project?

ANSWER: No, participating is free - no payment of any kind is required.

Who will participate in the Washington State Road Usage Charge pilot?

ANSWER: We are looking for at least 2,000 drivers throughout Washington to participate in the study beginning in early 2018. We need a diverse set of drivers: from urban, rural and suburban areas of the state; different car types including electric and hybrid cars; different household income levels, etc. We need the public's help and input to better understand how a road usage charge might affect all types of drivers, what works and doesn't work for them, etc.

What work has already been done?

ANSWER: The Washington State Transportation Commission and a 25-member stakeholder committee have been researching, assessing, and analyzing this potential replacement for the gas tax since 2012 in close partnership with the Washington State Department of Transportation and the Department of Licensing.

Are other states interested in road usage charging?

ANSWER: Oregon began a voluntary road usage charge program in 2015 and has approximately 1,000 participants. California is nine months into a road usage charging pilot program with approximately 5,000 volunteers.

Vehicle Licensing Office Transactions Log

The following pages comprise the chronological transaction log to be updated each time a CSR handles a WA RUC pilot project Participant request.

The transactions log provides the column headings for key items CSRs need to note each time they interact with a Participant to take pictures of the license plate and odometer reading.

Transactions Log for January-February 2018						
No.	Name	Date	Check in time	Check out time	Pictures uploaded Y/N	a) Troubleshooting Issues, if any b) Comments, if any
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Appendix C: Results for the Onboarding Survey

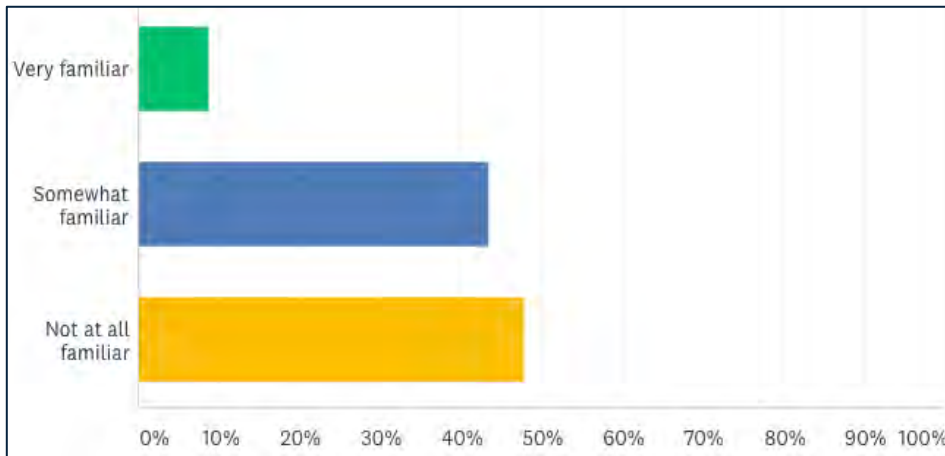
C.1 Warm Up

- Please indicate the name of the Vehicle Licensing Office you work for:**

Answered: 23 Skipped: 0

- How familiar were you with the concept of road usage charging before the WA RUC pilot?**

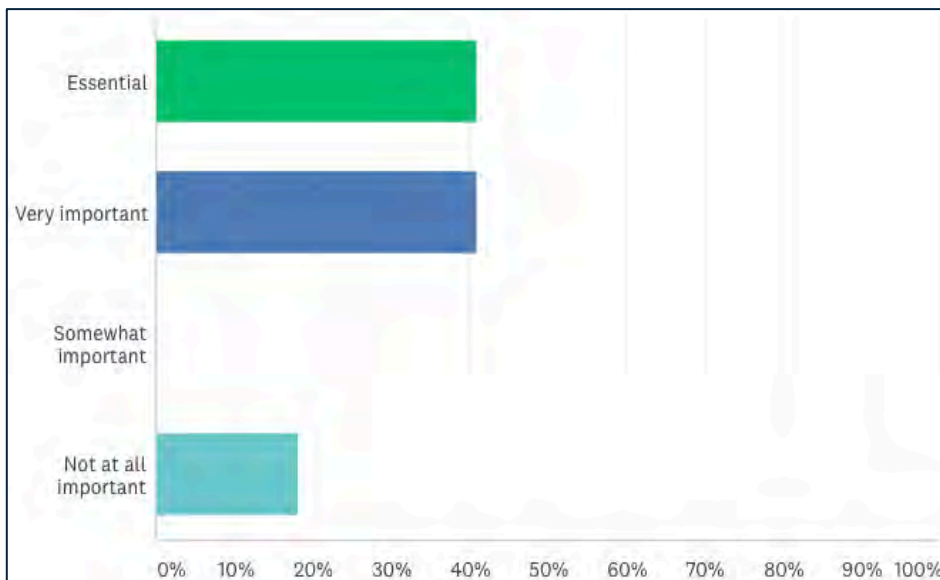
Answered: 23 Skipped: 0



C.2 On-site Training

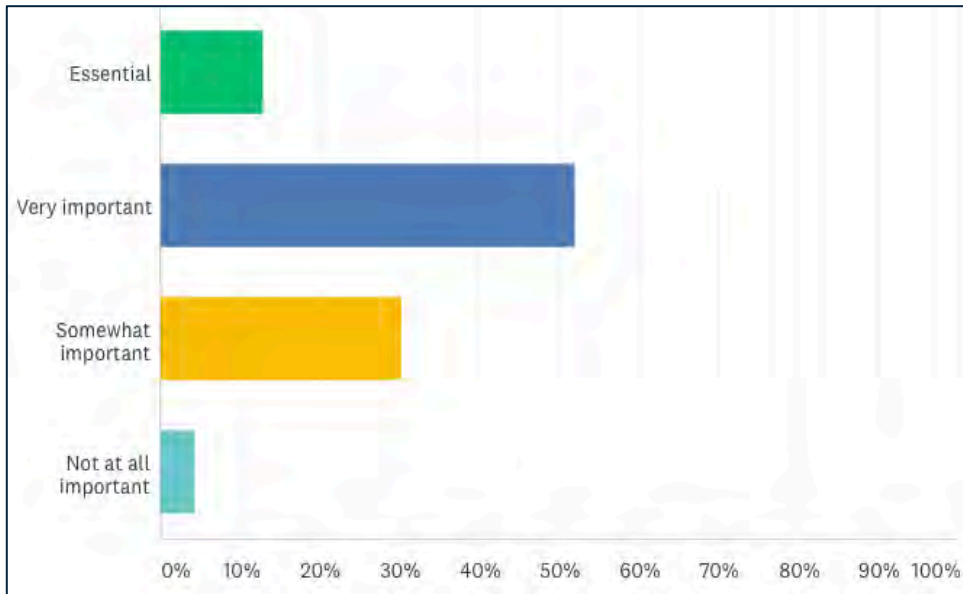
- How important was the on-site training in preparing you for serving pilot participants?**

Answered: 22 Skipped: 1



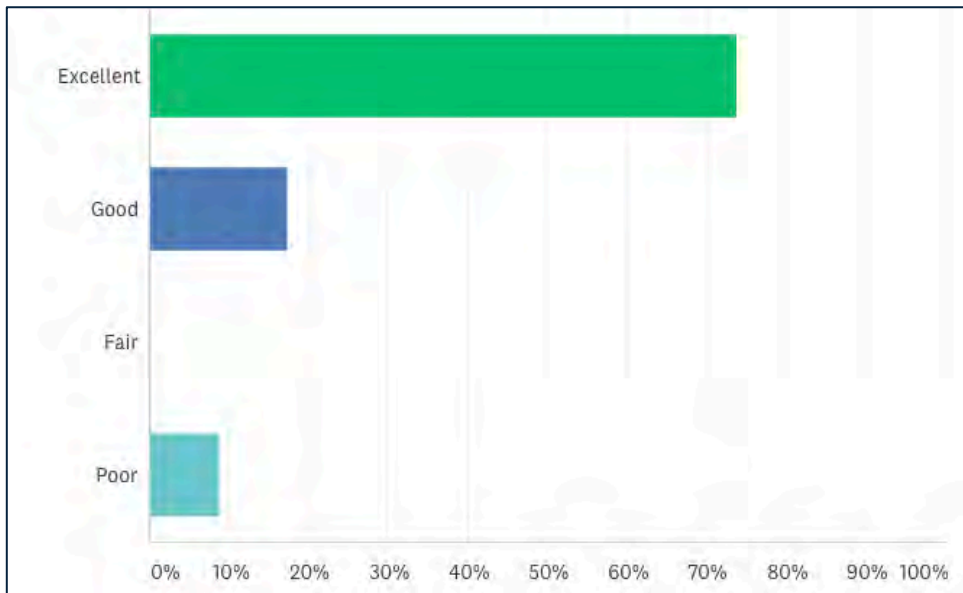
4. How important were the user manuals in helping you serve pilot participants?

Answered: 23 Skipped: 0



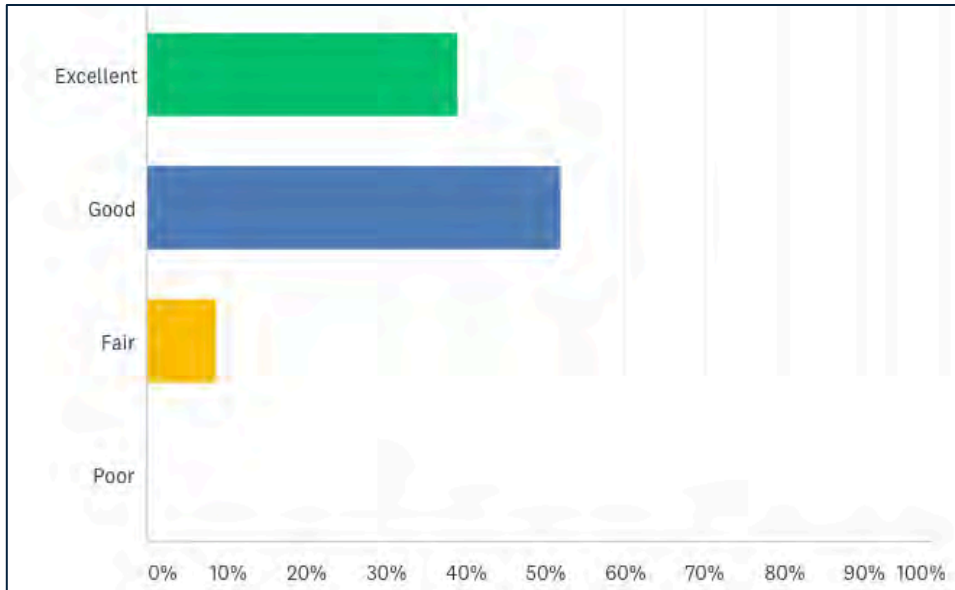
5. Thinking about the on-site training, please rate how well it prepared you to support participants with submitting their odometer readings.

Answered: 23 Skipped: 0



6. Thinking about the user manuals, please rate how helpful they were in servicing participants with their odometer readings:

Answered: 23 Skipped: 0



7. Please provide any comments you may have on the training and materials provided:

Answered: 3 Skipped: 20

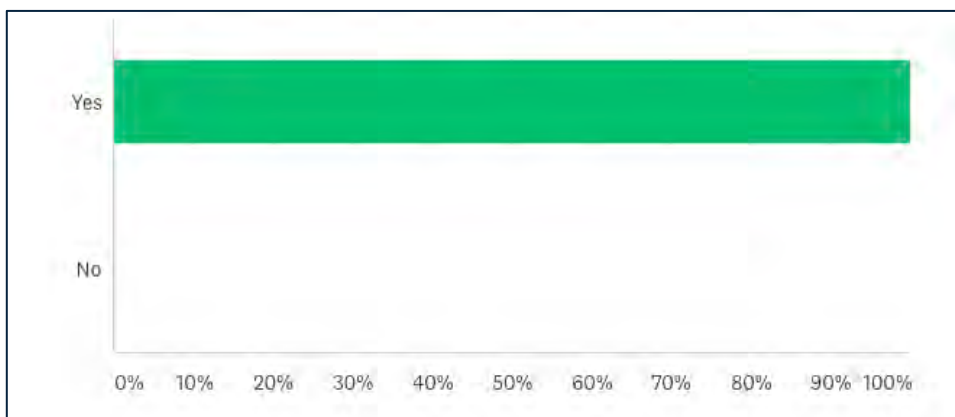
Sample answers:

- ▶ Training was superb, he made it easy to understand our duties and how to assist the car owner
- ▶ The trainer was not able to answer any of our questions. He basically just read the manual to us and left. Our very first RUC customer made us look like idiots because we were not prepared to answer any questions about the program.

C.3 Providing WA RUC Pilot Services

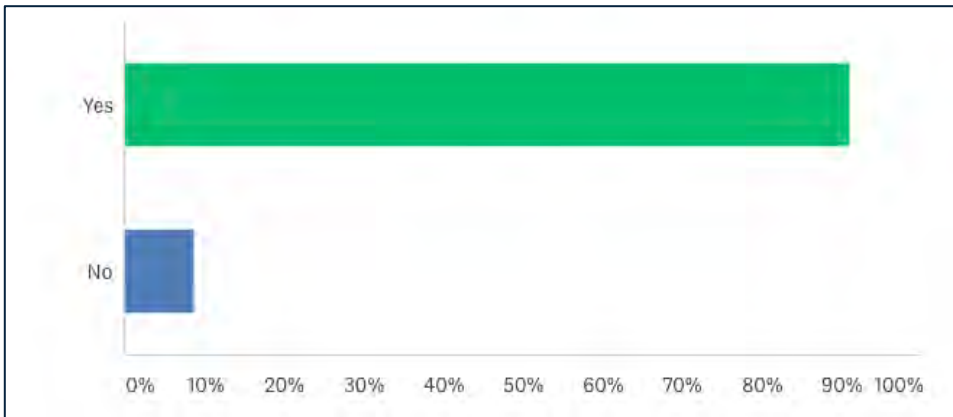
8. Have you provided service to at least one participant odometer readings?

Answered: 23 Skipped: 0



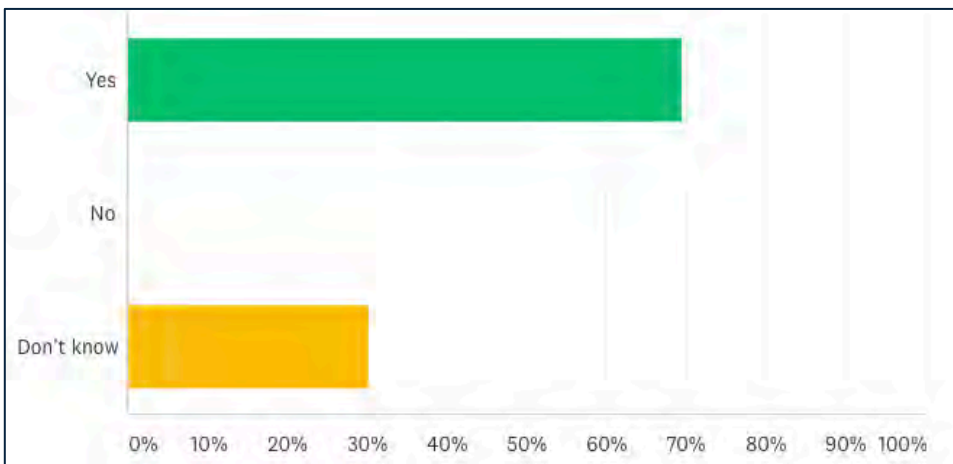
9. Do you feel comfortable assisting participants and answering their questions?

Answered: 23 Skipped: 0



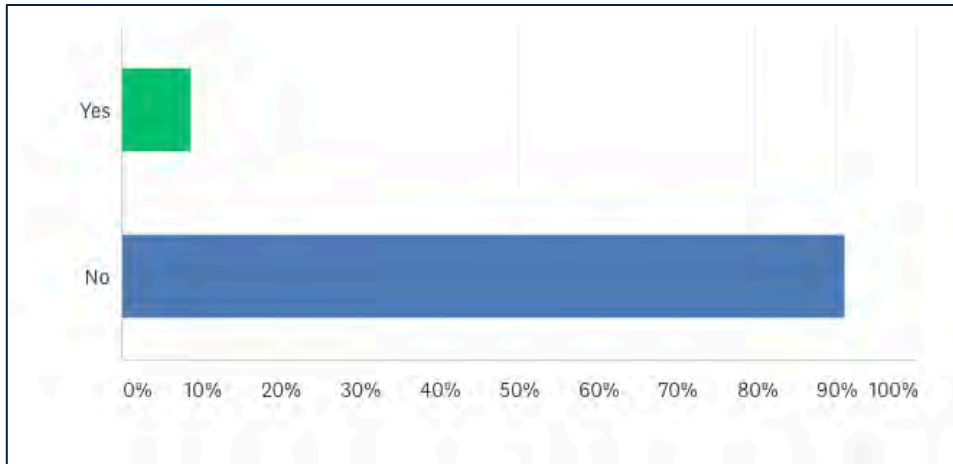
10. Do you think that this method for taking pictures of license plate and odometer is working well?

Answered: 23 Skipped: 0



11. Do you have any comments or feedback on the MVerity App for taking and uploading pictures?

Answered: 23 Skipped: 0

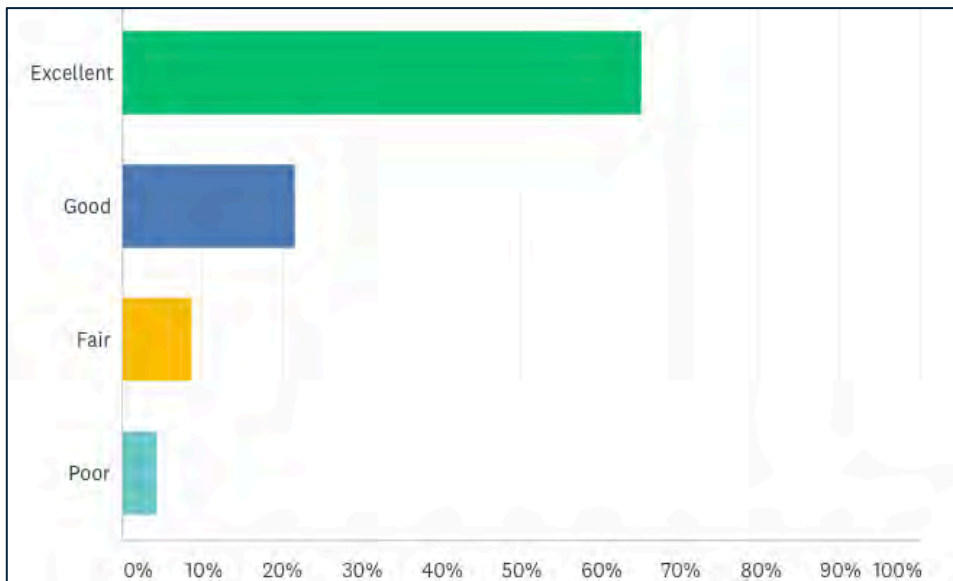


Comment:

- Sometimes the software works and sometimes it doesn't, usually we have to restart the phone in order to have the app work again but even sometimes that doesn't work. I'd like to see a more reliable app produced or this one have its bugs worked out.

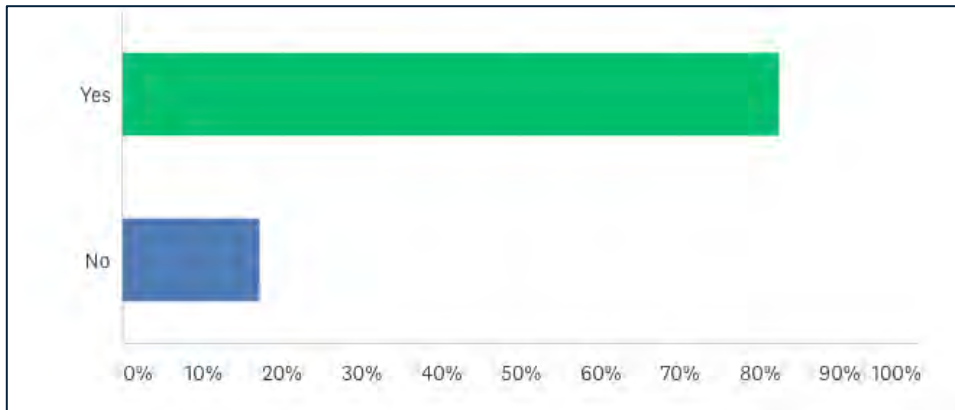
12. How do you feel about the level of support from the WA RUC Pilot Team?

Answered: 23 Skipped: 0



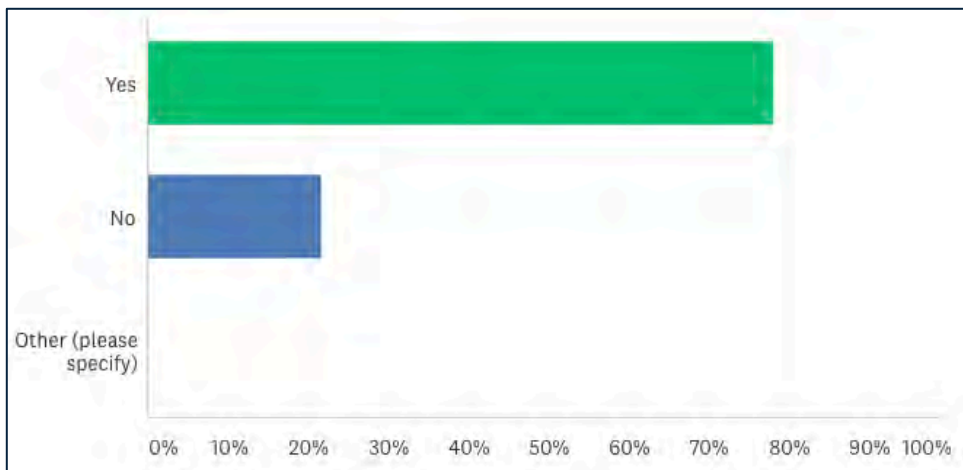
13. Do you know whom to contact when you have issues with participants?

Answered: 23 Skipped: 0



14. Do you know whom to contact when you have technical issues?

Answered: 23 Skipped: 0



C.4 General feedback

15. Do you have any ideas on how the process for submitting odometer readings through the VLO could be improved?

Answered: 7 Skipped: 16

Sample answers:

- ▶ none. very efficient process
- ▶ No, I think it works fine
- ▶ None

16. Do you have any ideas on how the participant experience through the VLO could be improved?

Answered: 7 Skipped: 16

Sample answers:

- ▶ I think all the participants are text savvy and they know how to do it on their own phones
- ▶ None
- ▶ No works just fine
- ▶ Having the customer enter a phone number and the app should pull up their information rather than have them enter all their information every time.

Appendix D: Results for the Closeout Survey

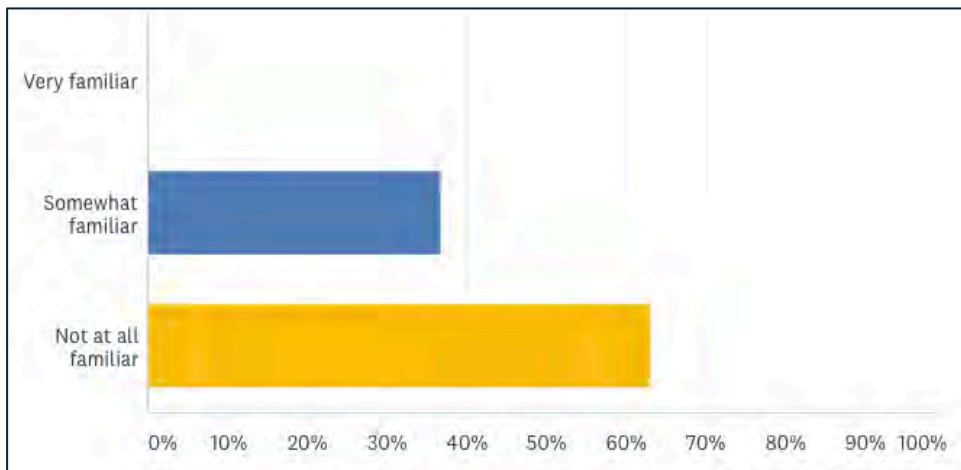
D.1 Warm Up

1. Please indicate the name of the Vehicle Licensing Office you work for:

Answered: 19 Skipped: 0

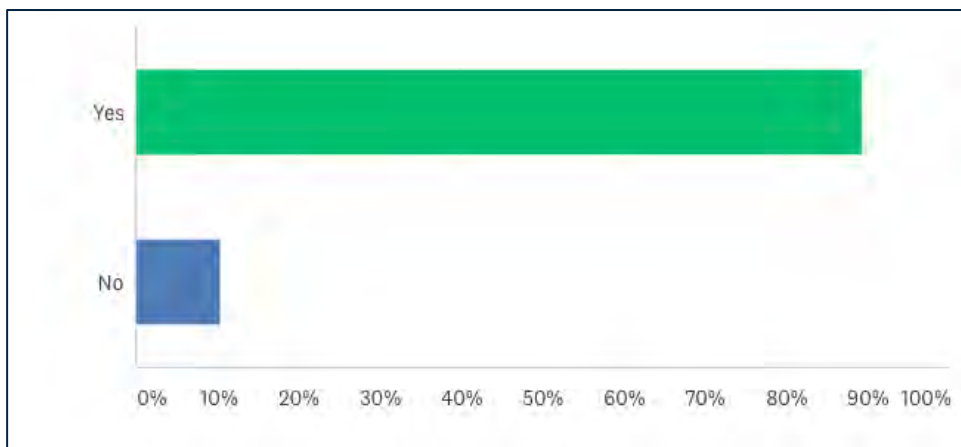
2. How familiar were you with the concept of road usage charging before the WA RUC pilot and on-site training?

Answered: 19 Skipped: 0



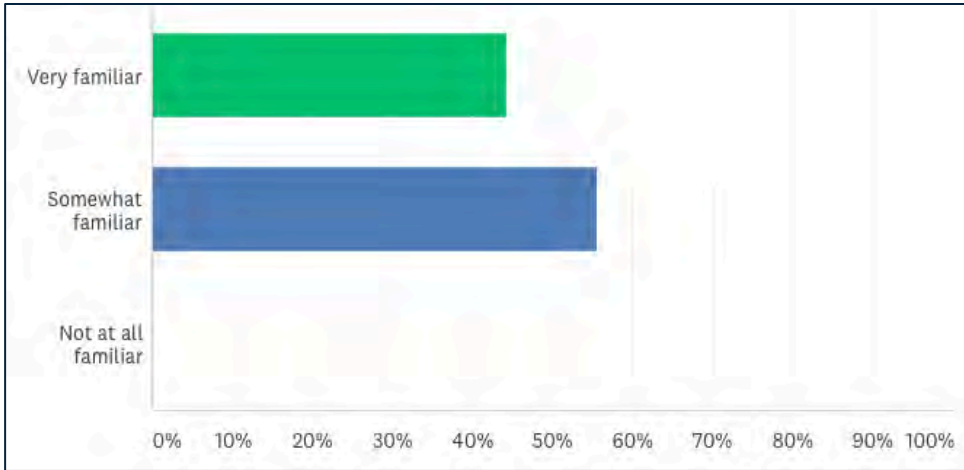
3. Did you participate in the on-site training?

Answered: 19 Skipped: 0



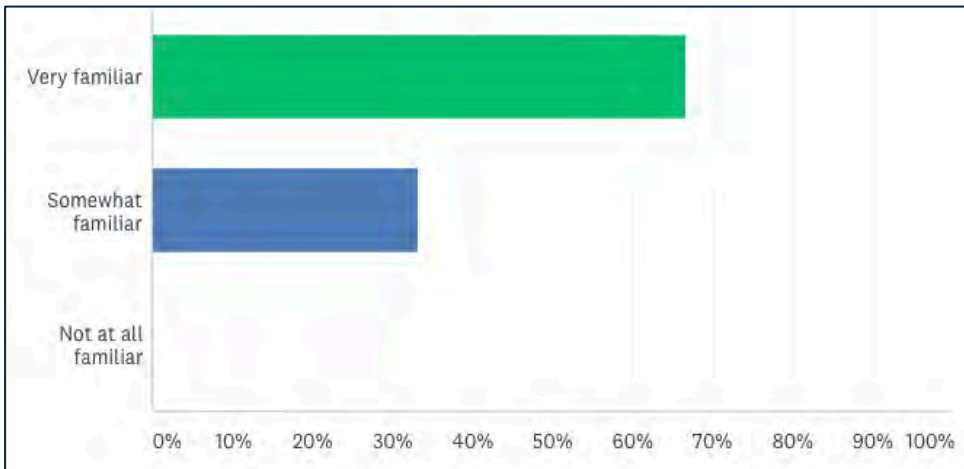
4. If Yes, how familiar were you after the training with the concept of road usage charging for the WA RUC pilot?

Answered: 18 Skipped: 1



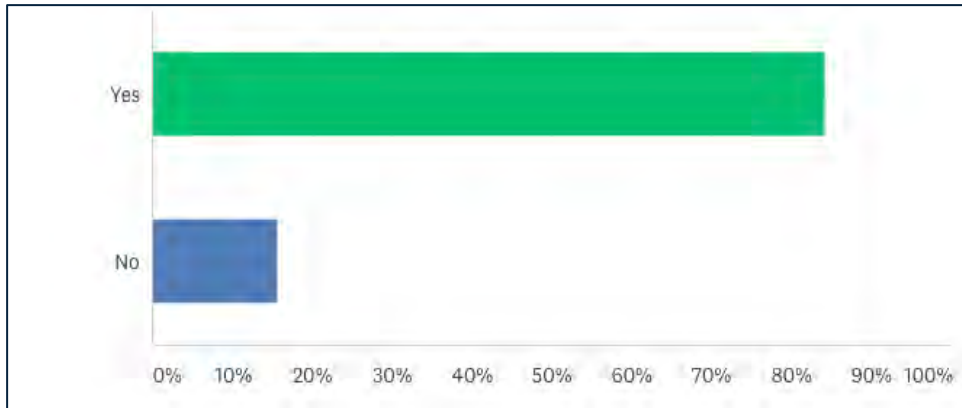
5. How familiar do you feel with the RUC now?

Answered: 18 Skipped: 1



6. Has YOUR experience with providing RUC services helped YOU become more familiar with the concept of road usage charging?

Answered: 19 Skipped: 0

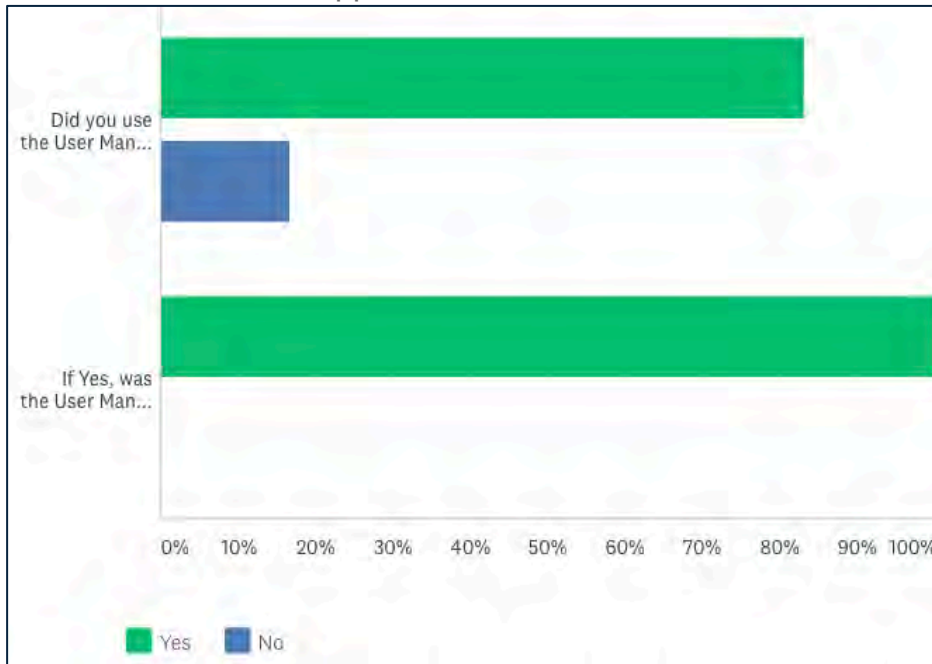


Comments:

- ▶ It made me very aware of the taxes I pay at the pump. Things that I didn't pay attention to and took for granted...now mattered.
- ▶ It educated me. I learned more about gas tax and actual usage expense.
- ▶ Made me aware of taxes.
- ▶ Learned on how it will work, if it does take in effect.
- ▶ Now nice and it was easy to report
- ▶ Program was easy to follow and set up good.
- ▶ Easy, fast, enjoyable.

7. As part of the training, the User Manual for VLOs was provided. Did you use the User Manual (for reference or to answer your own or a customer's question)?

Answered: 18 Skipped: 1



	YES	NO	TOTAL
Did you use the User Manual (for reference or to answer your own or a customer's question)?	83.33% 15	16.67% 3	18
If Yes, was the User Manual easy to use?	100.00% 15	0.00% 0	15

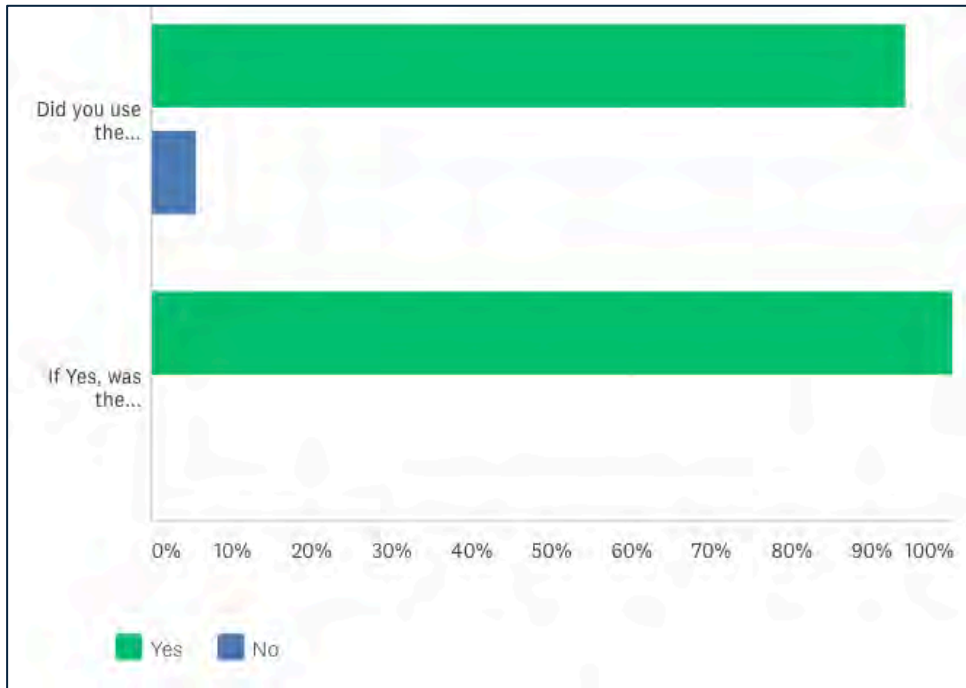
Do you have any suggestions for how the User Manual might be improved?

Comments:

- ▶ Our initial training was very thorough and it was good to have a back up manual if needed.
- ▶ I read it for a refresher.
- ▶ We used it just once as a refresher – Steve ore educator trained us well and we retained the knowledge he shared with us.

8. As part of the odometer reading service, a Transactions Log was provided for VLOs to check-in and check-out Participants. Did you use the transactions log?

Answered: 18 Skipped: 1



	YES	NO	TOTAL
Did you use the transactions log?	94.44% 17	5.56% 1	18
If Yes, was the Transactions Log easy to use?	100.00% 17	0.00% 0	17

Do you have any suggestions for how the Transactions Log might be improved?

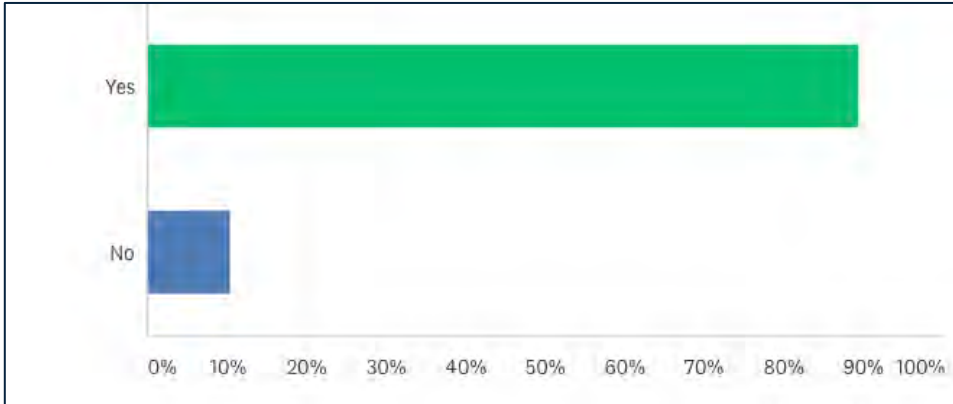
Comments:

- ▶ The transaction log was perfect and easy to use – no improvements needed.
- ▶ No it was perfect and easy to use.
- ▶ None

D.2 Providing WA RUC Pilot Project services

9. Have you provided odometer reading services to at least one participant?

Answered: 19 Skipped: 0

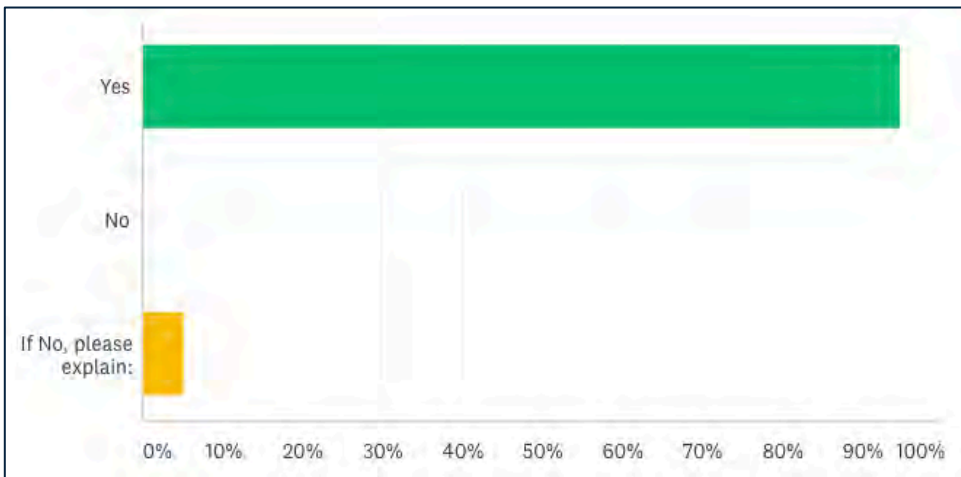


If Yes, please indicate how many participants you *personally* helped:

Total entered: 82

10. Did you feel comfortable assisting participants and answering their questions?

Answered: 19 Skipped: 0

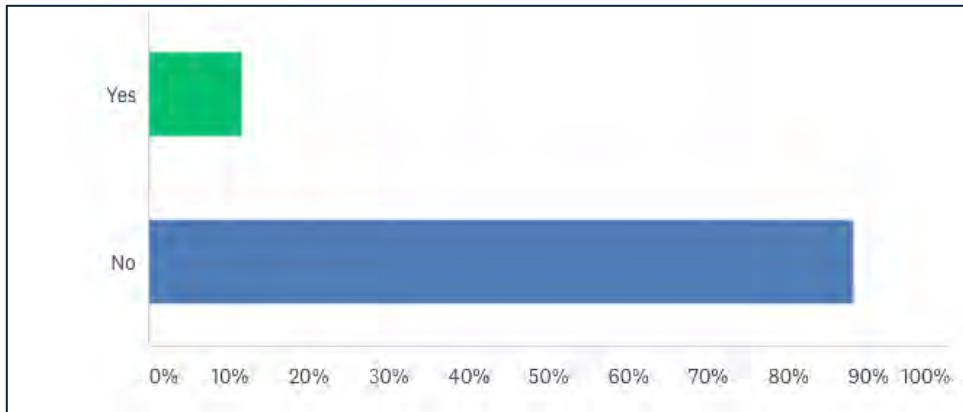


Explanation:

- ▶ Most of the questions were about on how to use the app than anything else.

11. Did any participants ask questions you were uncomfortable answering (either didn't know the answer due to lack of training/references or felt it was outside the VLO responsibility)?

Answered: 17 Skipped: 2

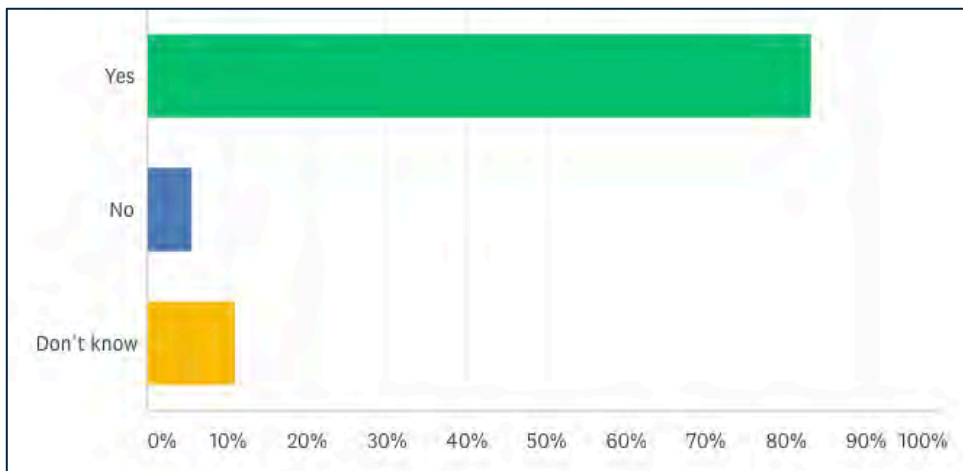


Comments:

- ▶ Everyone I dealt with was friendly and happy to participate. Eager to be part of the pilot program.
- ▶ People knew what they were into for the most part. No questions were asked that I could not answer.
- ▶ Any questions asked we were able to answer.
- ▶ I only helped one person and they didn't ask any questions.
- ▶ No participants asked questions

12. Do you think that using the iPhone and MVerity App to take pictures of license plates and odometers worked well?

Answered: 18 Skipped: 1

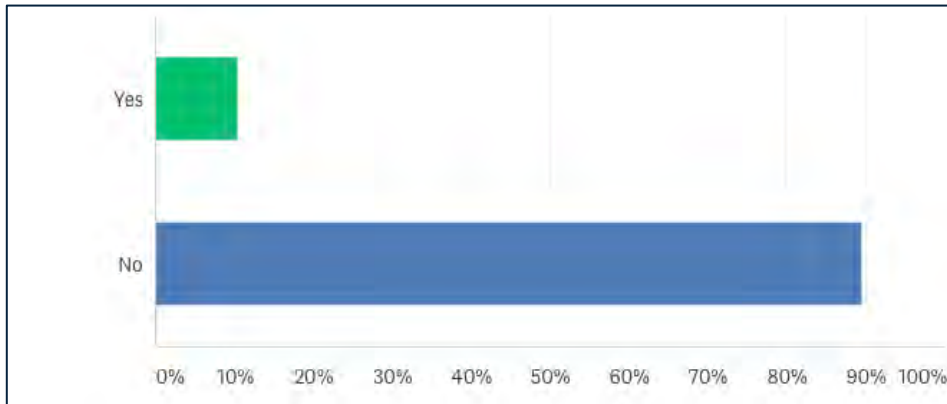


If no, please explain any specific problems you had:

- ▶ But the camera would not work sometimes. Took awhile to load sometimes
- ▶ But sometimes it took a very long time to load. I found myself looking for service.
- ▶ iPhone worked about 70% of the time.

13. Do you have any comments or feedback on the MVerity App for taking and uploading pictures?

Answered: 19 Skipped: 0

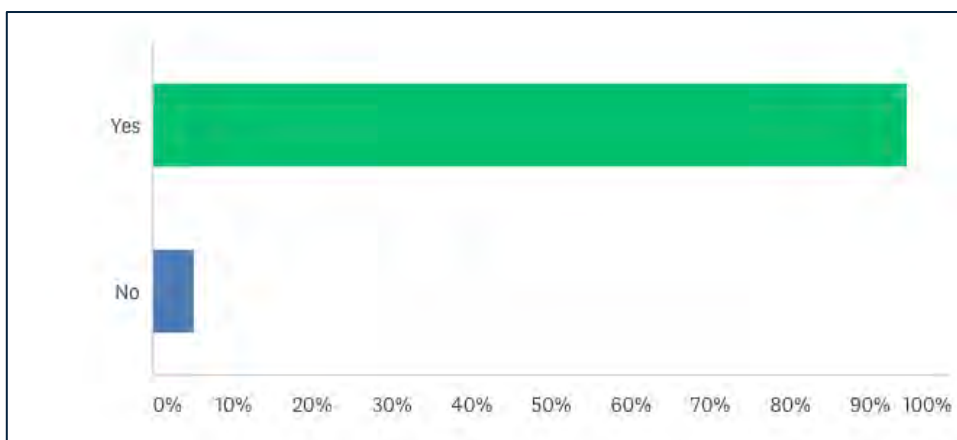


Comments:

- ▶ Maybe when you take the picture the app auto fills the mileage.
- ▶ Sometimes it took a bit long to load.

14. Did you know who to contact when you have technical issues or issues with participants?

Answered: 19 Skipped: 0

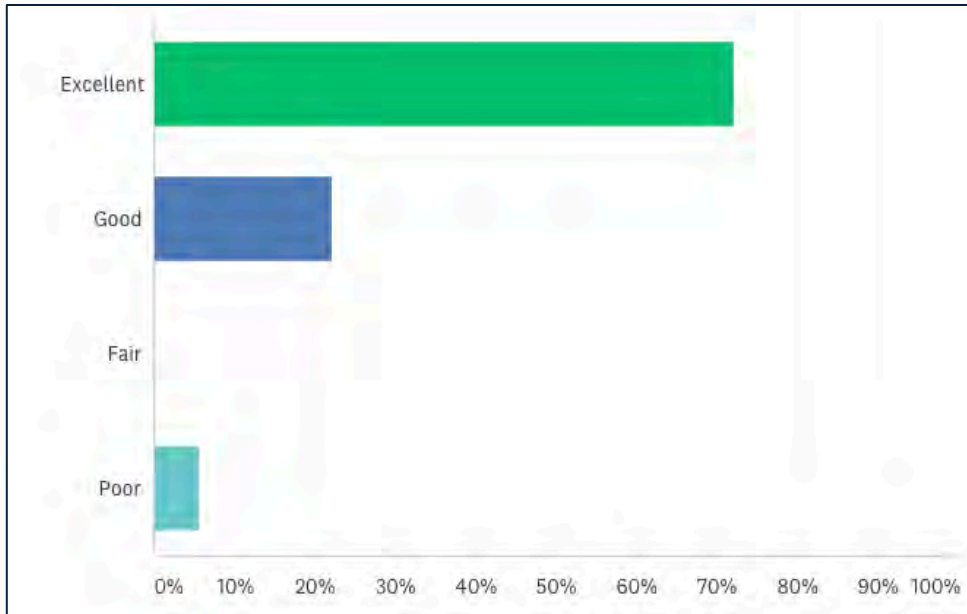


Comments:

- ▶ We had all necessary contacts
- ▶ Directions and contact information was very thorough

15. How do you feel about the level of support from the WA RUC Pilot Team (not the helpdesk)?

Answered: 18 Skipped: 1



How did support from the Team do? (please provide comments)

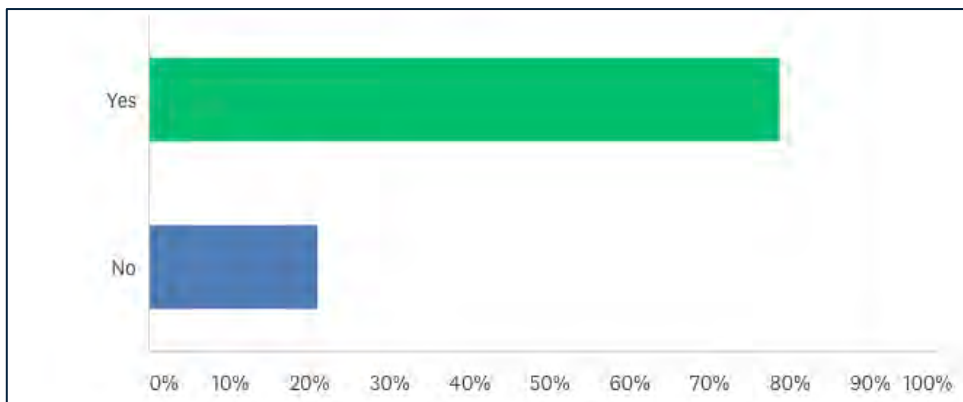
Comments:

- ▶ Steve was awesome, easy to work with and fun.
- ▶ I didn't have question on the side of agent but I did as a participant on the consumer side. My questions were answered quickly and efficiently.
- ▶ Any questions we had or assistance needed was answered immediately.
- ▶ They could not help with the issues we were having.
- ▶ Great easy to work with.

D.3 Benefits to VLOs

16. Based on your experience providing services at \$5 per transaction, do you think this is a fair fixed fee per transaction in comparison to other vehicle licensing fees?

Answered: 19 Skipped: 0

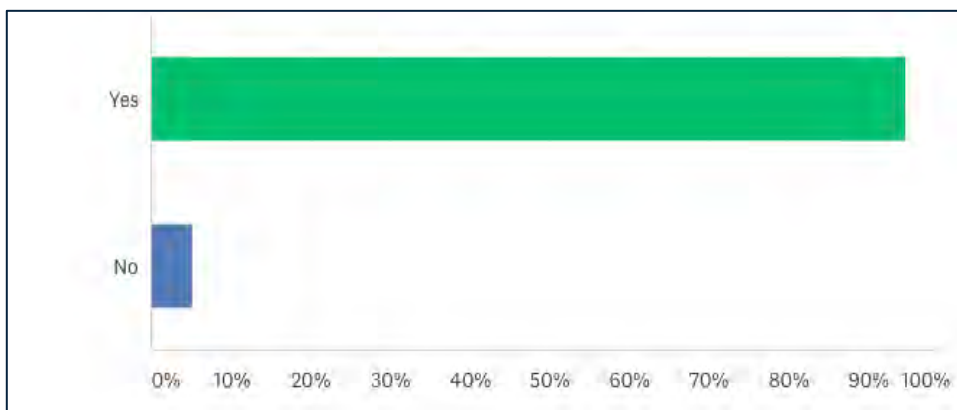


Comments:

- ▶ We need to collect information for DOL/DOR/DOT. It's a lot of departments for \$5.
- ▶ Inflation causes everything to go up for licensing fees. The DOL fees should be more fair based on inflation.
- ▶ It paid for the time of the employee.
- ▶ Fair fee
- ▶ This fee was appropriate for the time it required.

17. If a future system included VLO support for submitting odometer readings as an additional source of work and revenue, do you think your VLO would be interested?

Answered: 19 Skipped: 0



Comments:

- ▶ We enjoyed engaging with the participants. We went out to the vehicles and took odometer picture and it allowed us to spend time with them.
- ▶ It was fun communicating with customers. Hearing their feedback. Looked forward to next reading.
- ▶ It was easy to do. It's right up our alley and works well within our system.
- ▶ If an increase of fees were to given to office.
- ▶ If we get compensation for the additional work.

D.4 General feedback

18. Do you have any ideas on how the process for submitting odometer readings through the VLO could be improved?

Answered: 13 Skipped: 6

Key answers:

- ▶ Entry into DRIVES, links to WA RUC. Possibly a system linking (similar to emissions) to communicate between systems.
- ▶ Auto inputs the mileage when you take the picture.
- ▶ I think the way we did it was fine.
- ▶ We could enter at time of renewal.

19. Do you have any ideas on how the participant experience for reporting through their RUC through the VLO could be improved?

Answered: 13 Skipped: 6

Key answers:

- ▶ Customer did suggest when logging in if system could remember their info they had to re-enter name/email and the pics of plates/odo.
- ▶ More information could be provided to both the common people and the VLO participants.

20. Do you any final comments on the WA RUC Pilot Project and your involvement?

Answered: 13 Skipped: 6

Key answers:

- ▶ Feel it went smoothly and would be willing to help out with WA RUC projects if need be.
- ▶ I think it went great and was really straightforward.
- ▶ No
- ▶ No, it was pretty simple.
- ▶ None





A-15

RUC & RATE-
SETTING

 WA RUC



RUC and Rate Setting



PREFACE

The purpose of this report is to provide information for the Washington Road Usage Charge Steering Committee's consideration as it deliberates on the prospects for the State of Washington to transition to a per-mile fee system as a future replacement for the state's motor vehicle fuel tax (gas tax).

This report examines various considerations and approaches for setting a rate structure for a road usage charge (RUC) including application of appropriate factors based on policy priorities.

This report is being presented to the Steering Committee as a draft version for review and discussion at its upcoming meeting on March 14, 2018.

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EXECUTIVE SUMMARY

This paper provides considerations for setting rates for road usage charges (RUC). The paper begins by pointing out the legal context for RUC rate setting that must be resolved by the legislature, including determining the purpose and scope of a road usage charge and answering whether RUC is a tax or a fee. These determinations impact the governance of rate setting, namely whether the Legislature can delegate it to another entity.

Regardless of whether the Legislature delegates rate setting functions to another entity, it retains ultimate authority and discretion for rates and their methods of determination. As a practical matter, this means RUC rates ultimately are subject to political negotiation like any other tax or fee. Nevertheless, a model approach to rate setting can inform the Legislature's deliberations, and/or it can constitute the approach the Legislature defines for a delegated entity to follow.

This paper provides such a model approach to rate setting, consisting of four steps:

- ▶ Determine the RUC products to offer;
- ▶ Determine the per-mile rate(s);
- ▶ Determine the time permit rate(s); and
- ▶ Determine any exceptions

Products definitions determine the method and basis of payment, such as whether RUC is a pre-pay charge or a post-pay charge, and whether it is based on distance or time. The WA RUC pilot tested both pre-pay and post-pay distance charges, and the Steering Committee has long recommended including a time-based charge as a user option in any RUC system.

The recommended method for determining per-mile rates follows four basic steps itself:

1. Gather inputs
2. Conduct cost responsibility (also known as cost allocation) modeling (optional)

3. Conduct revenue modeling
4. Determine rate structure and rates

These four basic steps can be followed under any approach to rate setting, whether it is done purely by political negotiation, whether it uses revenue neutrality as a basis, or whether it is done purely as an analytical exercise by a delegated entity. Some distinctions exist for the available methodologies within each step, depending on the approach taken. For example, if the approach taken is revenue neutrality, it limits by definition the available bases for determining revenue targets.

Setting rates for time permits differs methodologically from the mileage permit, since it aims to offer an alternative to mileage-based fees for certain customers. A logical method for setting time permit rate(s) is to determine the mileage equivalent it should represent, then multiplying by the mileage rate. However, setting the mileage too low (e.g., at the median mileage driven) opens the overall system to substantial unrealized revenue, since high-mileage drivers can elect time permits to save cost relative to their cost responsibility based on mileage driven.

Exceptions to rate setting include exemptions for certain classes of vehicles and types of mileage driven (e.g., based on location), refunds, and credits/refunds against fuel taxes paid. Exceptions form an important part of rate setting because they limit the total revenue available, which impacts the base rates.

An appendix is included containing international examples of RUC rate setting including New Zealand's RUC program, Oregon's RUC and weight-mile tax program, and European vignette systems.

1 INTRODUCTION

This paper provides considerations for setting rates for road usage charges (RUC). This introductory section provides context for considerations for RUC rate setting, including a summary of several legal aspects of rate setting that go beyond the scope of the paper. Sections 2 through 5 provide considerations and alternatives for each of four steps in developing a RUC program rate structure: determining charge “products,” determining per-mile rates, determining time permit rates, and determining exceptions. An appendix provides examples of rate setting from charging programs worldwide.

1.1 Determining the purpose and scope of a road usage charge

The purpose and scope of the RUC will largely determine the nature of its rate structure. The public policy purposes for RUC can vary. In Washington, the purpose is to restore lost revenue from declining gas taxes. Elsewhere, policy purposes have included new revenue, traffic management, and mitigation of environmental impacts.

The policy purpose impacts the RUC rate structure directly. If a legislature seeks only a revenue solution, the rate structure could be flat.¹ To manage traffic, the rate structure would likely need vary by geographic location and time of day. A legislature may consider attempting to achieve multiple policy goals with RUC, leading to a blending of purposes and a more complex rate structure.

Which agencies benefit from RUC revenues may also impact the rate structure. A legislature might allow augmentation of a state government RUC program by allowing local governments to use RUC for their own purposes by adding their own rates on top of the state rate.

In Washington, the legislature has expressed the policy purpose of RUC as a statewide revenue source to replace or restore lost revenue as fuel taxes decline.

¹ For light vehicles, as the Steering Committee has limited the scope of RUC consideration to light vehicles.

1.2 Is a road usage charge a tax or a fee?

Under state law, RUC may be determined to be either a tax or a fee. The outcome of this determination could impact which entity can set a rate structure for RUC and the threshold for its enactment.

A tax is usually considered a revenue raising measure applied for public purposes, in that the revenue raised is either not directly connected to a service or not limited by the cost of the service provided. A fee, on the other hand, is considered a revenue raising measure applied for a specific purpose and limited by the cost of provision of that service. The legislature's statement of the purpose of a RUC program may help determine whether RUC is a tax or a fee. Courts consider other factors for this determination such as whether the charge is voluntary or used for regulatory purposes, but the differentiating characteristics are not uniform across the states.²

The legal opinion of whether RUC is or should be a tax or a fee may differ from state to state, and may be determined by the legislature in the law that creates the RUC. In the state of Oregon, Legislative Counsel determined that a RUC imposed for maintaining or upgrading the state's road system was for a general purpose and therefore was a tax. This legal defining factor had import because passage of a tax in Oregon requires a 3/5 majority of each chamber of the state legislature. In Colorado, transportation funding advocates regard RUC as a fee. If this opinion holds legally, it will allow RUC enactment by the legislature without going to Colorado voters for approval.³

Whether RUC is a tax or a fee may also determine which entity—the state legislature or an authorized agency—has initiating authority to set the RUC rate structure. Detailed analysis of whether RUC is or should be a tax or a fee under Washington law is beyond the scope of this paper.

1.3 Rate setting governance

State constitutions tend to give sole authority to establish tax rates to the legislature, providing only limited ability for the legislature to delegate that

² <https://www.bna.com/extras-excise-difference-b17179894455/>

³ <https://leg.colorado.gov/agencies/legislative-council-staff/tabor>

authority. Setting fee rates are another matter. State legislatures often delegate to an authorized government agency broad authority to set fee rates, such as Washington's delegation of toll rate setting (with guidelines and limits) to the Transportation Commission.

Subject to constitutional limitations, some state legislatures may have the ability to delegate to a state agency the setting of a RUC rate—the actual number(s)—provided that rate setting is confined by certain parameters such as range, limitations on rate variability, the precise RUC payers, and other defining factors. Whether and how a state legislature can delegate rate setting will be determined by state law. Detailed analysis of whether the Washington state legislature can delegate setting a RUC rate to a state agency, or how it could do so, is beyond the scope of this paper.

1.4 Approach to rate setting

How a legislature sets a rate for either a tax or fee tends not to be defined in law. Relevant data and analysis, often conducted by expert authority, often informs the legislature's rate setting process, especially in complex situations. The outcome of an expert analysis, however, may not be conclusive. Often political negotiation enters the rate setting process and can have a major impact on the outcome. For example, under Oregon's proposed RUC program implementation legislation in 2013, the data and formula used to determine revenue neutrality between the fuel tax and RUC indicated the RUC rate should be 1.55 cents per mile,⁴ but negotiations lowered the rate for the voluntary program to 1.5 cents per mile.⁵

For rate setting processes delegated by the legislature to a designated agency, the legislature may strictly limit the agency's discretion to inside the bounds of relevant data, formula and expert analysis but, if not, political negotiations can enter this sphere of decision-making as well.

⁴ The calculation was based on the fuel tax rate and the average fuel consumption of a light motor vehicle. The calculation therefore was: 30 cents/19.355 mpg = 1.55.

⁵ In 2017, the Oregon legislature simultaneously raised the fuel tax rate to 34 cents per gallon and the RUC rate to 1.7 cents per mile for 2018. The RUC rate increase directly relates to the fuel tax increase: (34 cents per gallon (new fuel tax rate)/30 cents per gallon (old fuel tax rate)) x 1.5 cents per mile = 1.7 cents per mile. Thus, the original, negotiated RUC rate has held fast, relative to the 2018 gas tax increase, without further application of data, formula or analysis.

Should it enact a RUC program, the legislature will have full authority and discretion to set or delegate the setting of RUC rates. As with any tax or fee, no matter how rigorous the inputs or processes, the rate ultimately is a policy choice resulting from a political negotiation. This paper aims to inform that negotiation process with information and choices.

2 ROAD USAGE CHARGE PRODUCTS

We break down the process for setting RUC rates into four stages: determining products to offer, setting per-mile rates, setting time-based rates, and determining exceptions. This section covers the first stage: deciding which RUC product or products to offer.

A product is an item to which a rate can apply. Product choices available for RUC include the following.

- ▶ A post-pay, per-mile charge. The WA RUC pilot tested several operational approaches to quantifying a post-pay, per-mile charge product, including the plug-in device, odometer charge, and *MileMapper* smartphone application.
- ▶ A pre-pay, per-mile charge. The WA RUC pilot tested one approach to operationalizing a pre-pay, per-mile product: the mileage permit.
- ▶ A pre-pay, time-based charge. The WA RUC pilot did not test a time-based charge, but earlier work by the Steering Committee identified a time permit as a viable RUC product.

The sections below discuss each of these products in detail.

2.1 Post-pay mileage charge

A post-pay mileage charge structure can be as simple as a single rate for all vehicles on a per-mile basis. Although the pilot made a pre-pay option available (the mileage permit), only about 1% of participants elected this method, with the other 99% electing one among several post-pay options. Per-mile rates can also vary according to the following factors:

- ▶ Geography. Where and on what roads does the charge apply? Does it vary by location? The Washington RUC assessment, and the pilot, applied a single, per-mile rate for all light vehicles for use of public roads in Washington, regardless of geography. To exclude miles driven off road or out of state from a real per-mile charge, drivers would have to select a reporting option with location-detecting technology. In the pilot, about half of drivers selected location-aware reporting options.

- ▶ Vehicle type. On what vehicles does the charge apply, and does it vary by vehicle characteristics? Rates can vary by vehicle type, particularly if the DOL registry can identify relevant characteristics (e.g., weight, fuel type, fuel economy, age). The Washington RUC assessment thus far has examined only four-wheel, light-duty vehicles, and the pilot was limited to participation by such vehicles. The RUC assessment and pilot neither assumed nor applied any variation in rates among those vehicles.
- ▶ Time and date. On what dates and times does the charge apply, and does it vary by time or date? Washington’s RUC concept applies the same per-mile rate on all days, at all times, just like the gas tax.
- ▶ Other factors. Are there other factors that influence the rate, such as environmental factors, differentiation by vehicle occupancy, or discounts or exemptions by vehicle type? No other factors have been assumed or proposed for RUC policy in Washington, but it is possible to exempt or discount certain vehicle categories for specific policy purposes. Such exemptions or discounts reduce revenues and increase administrative costs to apply and enforce.

2.2 Pre-pay mileage charge

A pre-pay mileage charge is based on pre-purchasing future travel. As with the post-pay product, a pre-pay per-mile product could have variable rates by vehicle type, but not for other factors that might vary during travel such as location, time, or other factors. Other factors to consider for a pre-pay mileage charge product include the base per-mile rate and the mileage increments available for purchase.

The pre-pay per-mile rate could theoretically differ from the post-pay rate. The policy reasons for varying the rate could include the time value of money (i.e., cash flow benefit to the state of capturing revenue upfront merits a lower rate). On the other hand, the transaction costs of pre-pay mileage permits, especially small increments, could outweigh such benefits. Such considerations are likely so trivial as to not merit rate distinctions between per-pay and post-pay products.

Another factor that can vary for a pre-pay charge product is the quantity of miles available for purchase (“blocks of miles”). To minimize transaction costs, a minimum quantity sufficient to avoid the need to frequently purchase further blocks

of miles will reduce administrative costs. New Zealand's its RUC system requires purchases in 1000km increments (621 miles). This allows for an infrequent road user to purchase distance infrequently, while a high-frequency long distance driver can purchase several thousand miles at once to avoid the need to undertake more transactions unnecessarily. The WA RUC pilot featured a minimum block of 1,000 miles and a maximum of 10,000 miles.

2.3 Pre-pay time-based charge

The RUC Steering Committee previously explored and recommended a time permit as a feature in any prospective RUC policy. A time permit allows road users to opt out of the requirement to report miles altogether by paying for access for a period of time rather than for distance, akin to a vehicle registration fee. Although various European countries have used time permits to charge for road use, none have done so as an alternative to charging by distance, fearing that high-mileage users would opt for a time permit to pay less than their mileage traveled would require. The simplicity and familiarity of a time permit notwithstanding, it has the potential to distort behavior and cap the revenue available from distance-based charges as high-mileage users “game” the system.

There are two high-level options for designing a time permit:

- ▶ Offer a single product for one time period, based on the likely profile of users most likely to prefer a time permit over a distance-based product. For example, an annual time permit could be offered as an alternative for all users subject to RUC. Such a product would be most attractive to users who travel the most miles in a year, so effectively caps revenue from those who drive the most. Such a product would incentivize such users to use the road network as much as they wish with no financial impact, unlike the gas tax or distance-based RUC. To address this concern, the rate could be set sufficiently high to disincentivize all but the highest mileage users of the network from gaming the system.
- ▶ Offer a range of time-based products to meet needs of various classes of users. Multiple products could range from a day to a year and allow the time permit more flexibility. It could allow for very short visits, vacations, or short business trips through to providing a real alternative for

residents, by setting a fee based on annual mileage. In Europe, it is common for such products to exist for visits of four days, one week, one month, or one year. Such an array of products could also be attractive to out-of-state visitors, should the policy apply to them. However, such products would need rigorous enforcement, to ensure they were not being regularly violated.

3 PER-MILE RATE DETERMINATION

The second stage of setting RUC rates involves determining a per-mile rate. Setting the per-mile rate requires understanding the purpose of RUC, the use of revenue collected, and the beneficiaries of spending. This section presents relevant objectives, rate-setting steps, and alternative approaches to determining per-mile rates. It concludes with special considerations for revenue neutrality and regular rate reviews.

3.1 RUC policy objectives relevant to determining rates

The approach for setting a per-mile RUC rate should follow from policy objectives. The list below summarizes relevant RUC policy objectives expressed by the legislature and RUC Steering Committee throughout the RUC assessment.

- ▶ Sustain revenues. The motivating force for the legislature to explore RUC has been to sustain road revenue, in light of declining gas tax revenue as vehicle fuel economy improves.
- ▶ User pays. User pays is an inherent policy feature of both the gas tax (historically) and RUC. The Steering Committee has captured this in its guiding principle that “all users should pay a fair share.”
- ▶ Revenue neutrality. The Steering Committee has inferred from its legislative directive to study RUC as a possible gas tax successor that it also remain revenue-neutral with the gas tax. RUC business case analyses and the pilot itself assumed revenue neutrality.

These three policy objectives guide the RUC rate setting steps (Section 3.2) and alternatives (Section 3.3) presented in this section.

3.2 Basic steps for determining a per-mile rate

Figure 1 illustrates and the text below describes the analytical steps to determining a per-mile rate.

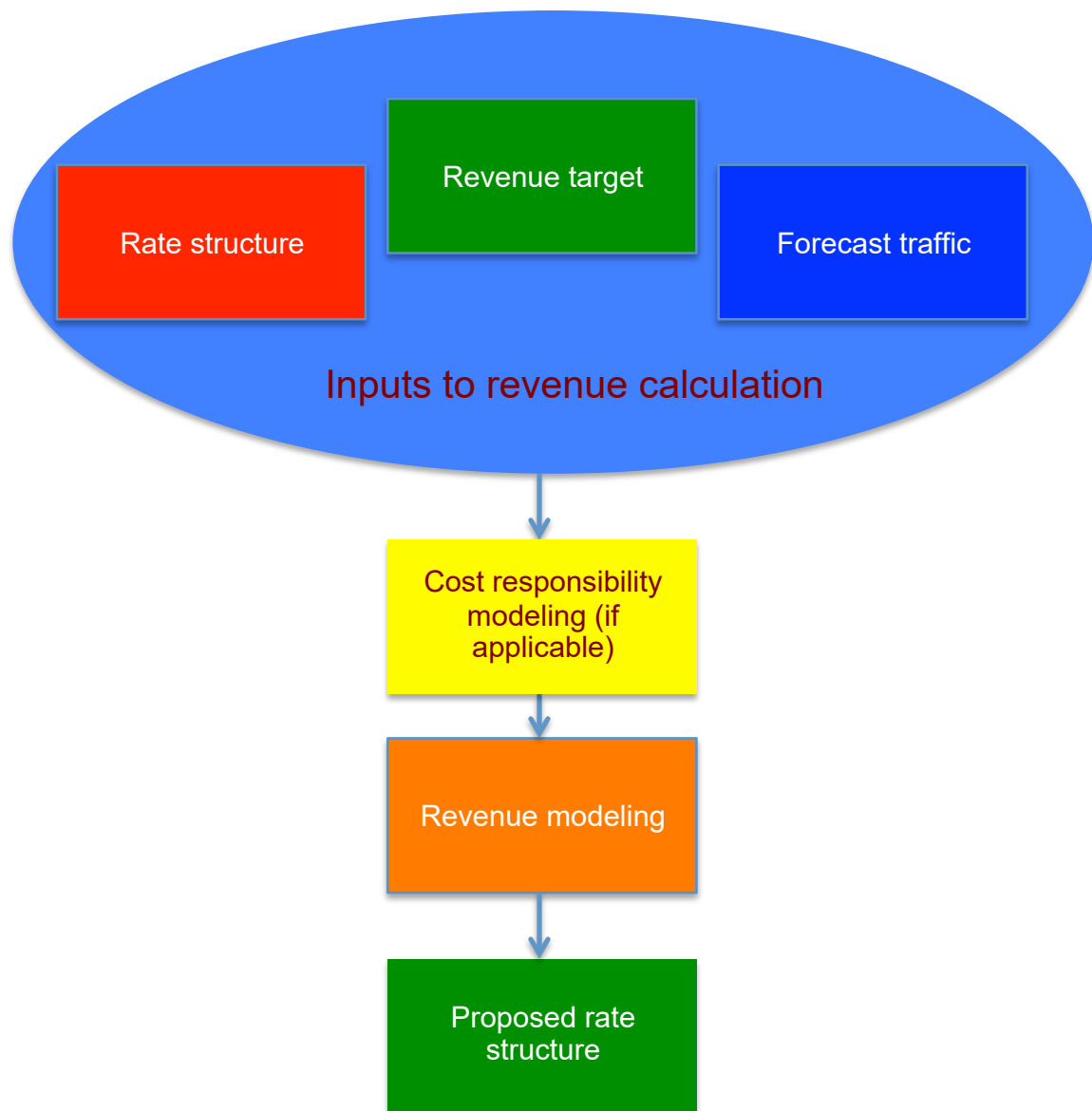


Figure 1. Steps in rate setting

Gather inputs: The three primary inputs to rate setting are:

- ▶ Proposed revenue target. How much revenue is expected or intended to be collected by RUC. This may be a simple revenue target (e.g., based on revenue neutrality or a fixed increase from prior years) or it could be total forecast expenditure on the road network to be funded by RUC and other revenue sources. It may be for one year or for multiple years if the rate is intended to apply for a longer period before being reviewed.
- ▶ Forecast mileage traveled. Expected vehicle miles traveled by all vehicles or just vehicles subject to paying RUC. This may be for one year

or for multiple years if the rate is intended to apply for a longer period before being reviewed.

- ▶ **Rate structure.** With the above two inputs, it is possible to identify an initial set of raw rates based on dividing the revenue target by expected traffic volumes by each category of vehicle under the rate structure.

These inputs form the core data used to set rates to meet a specific revenue target. Although they are not all necessary for all approaches to rate-setting, best practice is to at least consider all three sources of data to inform decision makers of the revenue impacts of any chosen rates.

Cost responsibility: For a more refined approach to user pays, the revenue target may be disaggregated into various areas of spending or costs to which economic principles can be applied to determine how to set rates by vehicle type (or by type of revenue). Although considered a best practice for optimizing rates, this step is optional.

Revenue modeling: A pure division of forecast miles traveled with the revenue target will not produce a rate that is likely to reflect what will be generated from RUC. Revenue modeling considers demand elasticities to reflect the impact of price on the number of miles traveled, and conducts sensitivity testing to observe how changes in key inputs affecting traffic demand (e.g. fuel prices, economic growth, population growth) impact revenue. This provides a more realistic calculation of what revenue may be generated by proposed rates.

From this analysis, a proposed rate structure can be derived, which is then subject to approvals and changes.

3.3 Approaches to determining a per-mile rate

Applying the steps outlined in Section 3.2, there are four broad approaches to determining a per-mile RUC rate.

- ▶ **Revenue neutrality/replacement.** Set rates that are broadly equivalent to what vehicles are charged with the gas tax.

- ▶ Revenue targets. Set rates primarily to raise a specific amount of revenue, which may be based on budgetary requirements for spending on roads.
- ▶ Cost responsibility. Set rates primarily to ensure that charged vehicles pay an equitable share of the costs of maintaining and developing the road network based on economic principles. Cost responsibility takes “user pays” a step further by linking the costs imposed by users on the road system to the amounts they pay for it.
- ▶ User acceptability. Set rates according to the levels likely to be acceptable to users, in order to balance revenue targets against public and political acceptability.

These approaches are not mutually exclusive, so elements of each can be combined. For example, revenue neutrality implies meeting a revenue target, and a revenue target can be the foundation for a cost responsibility approach. The key differences between these approaches lie in how the various steps in rate setting outlined above are undertaken. The remainder of this section walks through the rate-setting steps, highlighting variations for each step under each of the four approaches.

3.3.1 Set revenue targets

There are two broad approaches to setting a revenue target that reflects road infrastructure costs:

1. Forecast the budgetary requirements to maintain and develop the road network over a period of years, informed by engineering and policy analysis of the network’s needs to meet specific performance and policy objectives (this is the approach used in Oregon and New Zealand, as discussed in then appendix);
2. Develop a forward-looking cost base, using core accounting principles, to capitalize and amortize the capital costs of the road network (including the opportunity cost of capital), along with the operating costs of managing the road network over a period of years. This approach seeks to optimize the value of the network to road users, by calculating the base long run costs of sustaining the network, and allow for choices to be made on capital

spending on top of this (this is the approach used in some European countries).

Both approaches may seek to only recover a portion of the budgeted and/or amortized costs of the road network from RUC, either because of revenue from other sources (e.g., fuel tax, registration fees) and/or because it is politically unacceptable to recover all such costs. However, they do provide sophisticated targets for revenue that can be used to inform the setting of RUC rates, which can be revised regularly and provide highly transparent and robust bases to justify revenue targets over the longer term.

Table 1 summarizes options for revenue target setting under each approach to rate setting.

Table 1. Options for setting revenue targets

Rate setting approach	Options for revenue target setting
Revenue neutrality/replacement	<ul style="list-style-type: none"> • Forecast gas tax revenue assuming no erosion due to fuel efficiency/change in motive power. OR • Forecast gas tax revenue assuming vehicles subject to RUC would pay the fuel tax as the average MPG vehicle. AND • Include estimated administrative costs of RUC in addition to gas tax.
Revenue targets	<ul style="list-style-type: none"> • Proposed contribution of RUC to roads budget. • Proposed contribution of all motoring taxes to roads budget. • Proposed total roads budget.
Cost responsibility	<ul style="list-style-type: none"> • Proposed contribution of all motoring taxes to roads budget. • Proposed total roads budget.
User acceptability	<ul style="list-style-type: none"> • No specific options.

Under a revenue neutral approach, the target would be to replace revenue that is raised under the gas tax. This could be based on historic revenue or on forecasts

of gas tax revenue that assume no change in fleet fuel economy. In both cases, revenue neutrality might also consider the relative costs of raising revenue by RUC compared to the gas tax, to ensure that *net* revenues were similar. If RUC is only a partial replacement (e.g., only applies to some vehicles), then the cost of collection becomes less important since all revenue raised is effectively new revenue.

In the longer term, revenue neutrality with the gas tax is not compatible with revenue sustainability, so establishing a revenue target that is linked to the costs of providing the road network may be a more sustainable, more sound policy basis for rates for RUC (along with rates for other road revenue sources).

3.3.2 Forecast estimated traffic volumes

To meet revenue targets, there must be forecasts of estimated total miles traveled in the state by the vehicles subject to RUC on the roads subject to RUC. Traffic forecasting is typically based on forward projection of recent historic data and trends, with sensitivity testing based on key inputs that affect vehicle miles traveled. Factors to consider include:

- ▶ Population changes, including demographics;
- ▶ Changes in the vehicle fleet;
- ▶ Inputs into the costs of driving, such as fuel prices; and
- ▶ Economic growth.

Traffic forecasts should be sufficiently disaggregated to enable estimates of mileage for those vehicles subject to RUC, as well as any subsets of vehicles with RUC rates that vary by vehicle type. There should be no differences in the methodologies used for forecasting traffic under each of the rate setting approaches (i.e., future miles traveled should not depend on whether RUC rates are set based on revenue neutrality, revenue targets, cost responsibility, or user acceptability).

3.3.3 Model cost responsibility (optional)

With a revenue forecast and traffic volume forecasts basis, a uniform rate can be calculated by dividing revenue by total miles. This approach is the simplest

approach. It assumes that RUC is the only source of revenue and all subject vehicles will pay the same rate.

If either of those assumptions does not hold, then further analysis can determine what proportion of revenue should be raised from RUC, and how to set rates that differentiate between types of vehicles. There are two approaches to further analysis:

- ▶ Forecast estimated revenue from other sources, and identify the funding gap that RUC needs to fill;
- ▶ Undertake a cost responsibility study to identify how revenue should be raised from various sources, depending on the types of costs covered by the overall revenue target (e.g., fixed costs of road maintenance may be better raised from non-usage based taxes and charges).

If there are numerous classes of vehicles subject to RUC (e.g., ranging from motorcycles to heavy trucks), there is merit in undertaking analysis to allocate costs among vehicle types, so that each contributes according to the costs they impose on the road network or the benefits they receive from different categories of spending on roads.

If RUC aims purely to replace gas tax on all vehicles, then a cost responsibility study that allocates different types of spending on the roads in proportion to factors such as wear and tear should be undertaken, so that revenue is raised in accordance with the user pays principle. Oregon uses such an approach for its RUC system, and this approach is commonly used for RUC systems in Europe and New Zealand, largely to help inform rate setting so that rates do not significantly under or over-recover road costs attributable to those paying RUC.

Table 2, which present New Zealand's cost allocation model treatment of various elements, exemplifies how such a study may suggest road cost allocations among vehicle types.

Table 2. New Zealand's cost allocation model treatment of elements

Description	Cost allocation model treatment
Fixed costs not attributable to road use, such as weather-related wear and tear, administrative costs, and policing	Allocated to all vehicle types in equal proportions
Projects to increase network capacity	Allocated to vehicles based on road occupancy (using passenger car equivalent units)
Projects to benefit specific vehicle types	Allocated to the class of vehicle benefitting
Maintenance and replacement of infrastructure based on vehicle mass	Allocated to vehicles according to their relative impact based on equivalent standard axle mass

Details of how RUC rates around the world use cost responsibility models or studies are included in Appendix A.

3.3.4 Model revenues

Regardless of whether a cost responsibility approach is taken, it is important to undertake revenue modeling to accurately calculate the revenue generated by a range of rate options. Although RUC replaces or restores gas tax revenue, the rates may have an impact on traffic demand and vehicle miles traveled, however small. Revenue modeling should employ demand elasticities to determine how the introduction of RUC influences miles traveled. In addition, sensitivity tests can be applied to consider the impacts of macroeconomic changes on overall vehicle miles traveled. Revenue modeling from various rate levels increases the confidence of estimates.

If a rate structure is complex, revenue modeling will need to reflect different rates (and different forecasts of mileage) for different vehicle types, and even different products.

3.4 Considerations for revenue neutrality

A revenue-neutral RUC rate seeks to raise the same amount of revenue from vehicles that would otherwise pay through gas taxes. As simple as that appears, there are at least four dimensions to consider and define before computing a “revenue neutral” RUC rate, as summarized in the list below: mathematical, subject vehicle, financial, and temporal.

- ▶ **Mathematical dimension: Average vs. median vs. aggregate.** These three distinct mathematical approaches to defining revenue neutrality result in three distinct rates. Therefore, it is important to choose one explicitly in calculating a revenue-neutral RUC rate.
 - > **Median.** Revenue neutrality could refer to the notion that the “median” vehicle (according to fuel economy) is treated the same under both a fuel tax and a RUC, in terms of total tax paid. In this case, the revenue neutral rate is determined by finding the median miles per gallon of all vehicles subject to RUC and converting that individual’s gas tax into a mileage-based rate. For example, if the median vehicle driven in Washington gets 25 MPG, and assuming a fuel tax conversion basis of 49.4 cents per gallon, the RUC rate would be **2.0 cents per mile**.
 - > **Average.** Alternately, revenue neutrality could refer to the notion that the “average” vehicle pays the same in RUC as fuel tax. This is the approach taken for the WA RUC pilot. Mathematically, this has a different result from the median vehicle. Average MPG, determined by averaging the MPG of all vehicles, is likely lower than median MPG. For example, if the average MPG is 21, the corresponding revenue-neutral RUC rate is **2.4 cents per mile**.
 - > **Aggregate.** Revenue neutrality could also refer to the notion that aggregate revenues under both a fuel tax and a hypothetical RUC generate the same revenue. This calculation is made by dividing the total miles driven in Washington by total gallons consumed, and converting the resulting MPG into a mileage-based rate. This method

results in the lowest MPG of the three methods. If the aggregate fleet MPG is 19 MPG, it results in a revenue-neutral rate of **2.6 cents/mile**.

- ▶ Subject vehicle dimension: all vehicles or subsets? The definition of the applicable vehicle population is necessary for the correct computation of a revenue-neutral RUC rate or rates. The key question is to define the baseline population of vehicles to be included and for which subsets of those vehicles, if any, should the rate vary. There are many options.
 - > **One rate – do not vary.** If only a single rate is to be computed for all subject vehicles, then the computation is trivial.
 - > **Vary by fuel type.** One possibility is to vary the road charge rate by fuel type or motive source, so that diesel vehicles pay one rate while gasoline vehicles pay another. An unresolved question of this approach is how to address electric vehicles and other alternative-fuel vehicles, namely, whether they are included in the calculus for gasoline, diesel, or some separate classification(s).
 - > **Vary by weight.** Another possibility is to vary the rate by weight
 - > **Vary by weight and fuel type.** The rate could also vary by both weight and fuel type.
 - > **Vary by other factors.** The rate could vary by any other vehicle factor or classification, with a determination to compute the revenue neutral on the basis of that factor.
- ▶ Financial dimension: gross vs. adjusted gross vs. net. Using revenue neutrality as the basis for a RUC rate requires the specification of whether revenue is neutral with respect to gross, adjusted gross, or net revenue.
 - > **Gross.** A rate or rates based on gross revenue neutrality ensures that the total revenue expected to be generated by RUC is equal to revenue from corresponding fuel taxes, before consideration of leakage or collection costs.

- > **Adjusted Gross.** A rate or rates based on adjusted gross revenue neutrality ensures that the total revenue expected to be generated by RUC is equal to revenue from corresponding fuel taxes after consideration of leakage (including losses due to evasion and negligence)
- > **Net.** A rate or rates based on net revenue neutrality ensures that the total revenue expected from a RUC is equal to revenue from corresponding fuel taxes, after subtracting leakage and collection costs. As long as leakage and collection costs are higher for RUC than fuel tax, then the net revenue neutral rate for RUC will be higher than the gross revenue neutral rate.
- ▶ Temporal dimension: past year vs. current year vs. future year. Fuel tax rates change regularly as do MPG by vehicle fleet, so it is critical to define the year on which to base the computation of revenue neutrality. Over time, following rates on a MPG basis will result in reductions in rates, so care needs to be taken as to how closely RUC rates should follow trends in fuel consumption. For example, the aggregate, gross, revenue-neutral RUC rate for all vehicles in Washington in 2017 was likely higher than it would be in 2018, given that the overall MPG of the fleet would have improved in that year.

3.5 Rate reviews

Regardless of the approach taken, rates should be reviewed and revised at regular intervals to account for the wide range of factors that affect revenue:

- ▶ Inflation: RUC is not immune to the effects of inflation eroding the real money value of revenue collected. A range of inflationary measures could be used, from consumer prices to the costs of road maintenance and construction.
- ▶ Vehicle mileage traveled: If actual distance traveled is higher than forecast, revenue will be higher and this may be used to either increase spending on the road network or moderate any increases in rates for other factors. If it is lower, this may require rates to increase to meet revenue targets, although consistently lower levels of vehicle mileage

- may also reduce costs to develop and maintain the road network over the longer term.
- ▶ Changes in revenue targets/preferred expenditure levels: A range of factors may influence decisions to change the amount of revenue sought from RUC, either to change levels of spending on roads or to utilize other sources of revenue. Rates should be revised to account for significant changes in any revenue targets.

4 TIME PERMIT RATE DETERMINATION

Rate-setting for time permits represents a unique challenge. If Washington wishes to offer a time permit in one or more denominations (e.g., one week, one month, one year), the per-mile rate should be set first, and then the rates for the time permits should be set on that basis. This section presents considerations for setting the rates for various time permits. The appendix offers more information about rate setting for vignettes (time permits used in Europe).

4.1 Time permit customer segments

The first step in determining rates for time permits is the intended customer segment. Time permits may be desirable to residents and visitors alike.

For residents, a time permit may be attractive to avoid any requirement to report odometer readings and/or to avail themselves of the simplicity of paying once to avoid any perceived hassle. In some cases, policy may require residents to utilize a time permit, for example if they have evaded or failed to comply with mileage-based method, or if they have a vehicle for which no mileage reporting option works (e.g., a pre-1996 vehicle no OBD-II port and a broken odometer).

Out-of-state visitors, if subject to RUC, likewise may find time permits attractive, particularly if short denominations are available, such as one week or one month. While frequent out-of-state visitors may opt to set up an account with a service provider, infrequent out-of-state visitors may prefer a simple, short-term product they can purchase online. Offering time permits would allow them to drive however much they need for a period without buying a new permit, whereas a mileage permit may need to be renewed.

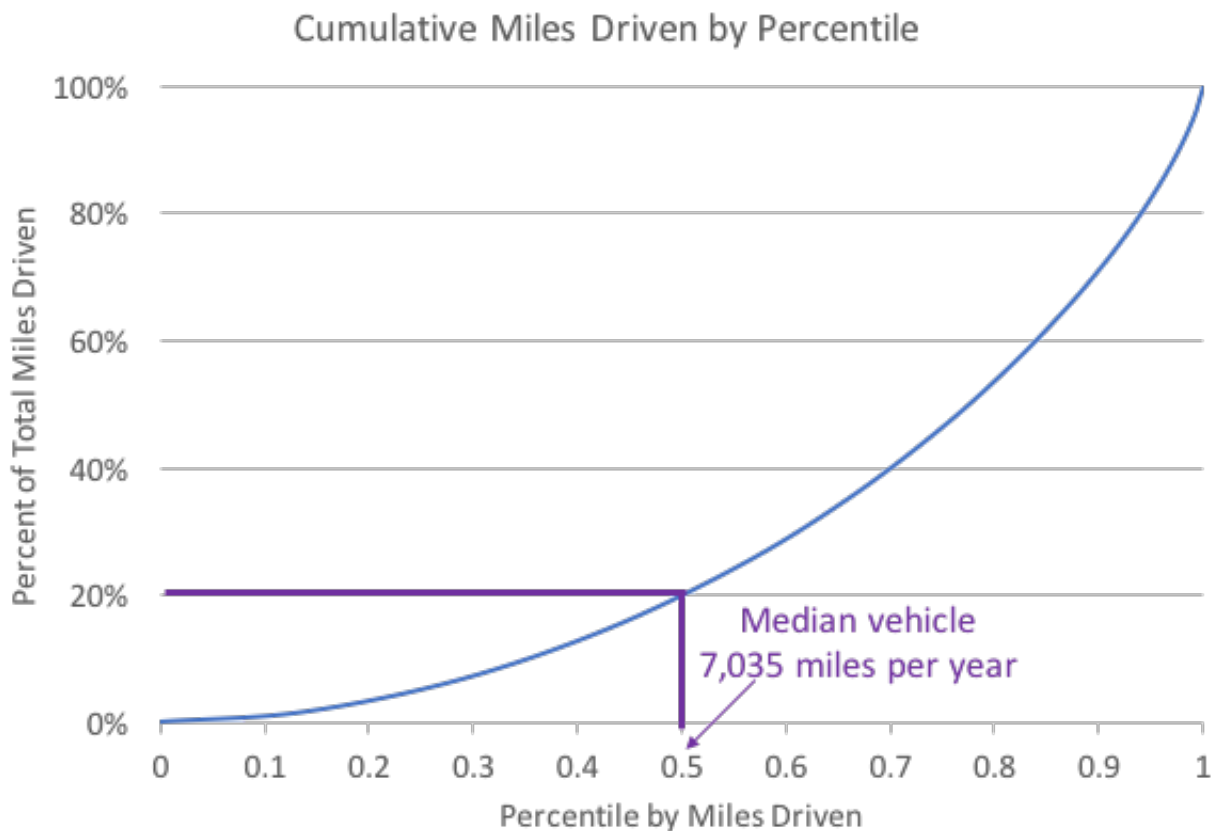
4.2 Determining time permit rates

The key trade-off in determining a rate for time permits is understanding how motorists might “game” the system. For example, consider if RUC applied to all drivers, and the state also offered an annual time permit set at a price equal to the median mileage driven by Washington drivers. In this scenario, the 50% of vehicle owners whose mileage exceeds the median would save money by purchasing a time permit and not paying for their mileage.

The median Washington vehicle (the fiftieth percentile) drives 7,035 miles per year. This means that half of all vehicles drive 7,035 miles or fewer per year. The other half drive 7,035 miles or more per year.

The blue curve in Figure 2 depicts the cumulative distribution of miles driven in Washington by percentile. The fiftieth percentile vehicle (the one that drives 7,035 miles per year) is indicated by a vertical purple line. What the chart reveals is that the half of vehicles that driver 7,035 miles or fewer drive, cumulatively, only about 21% of all miles driven by Washington vehicles in a year. The other 79% are driven by the 50% of vehicles that drive more than 7,035 miles per year.

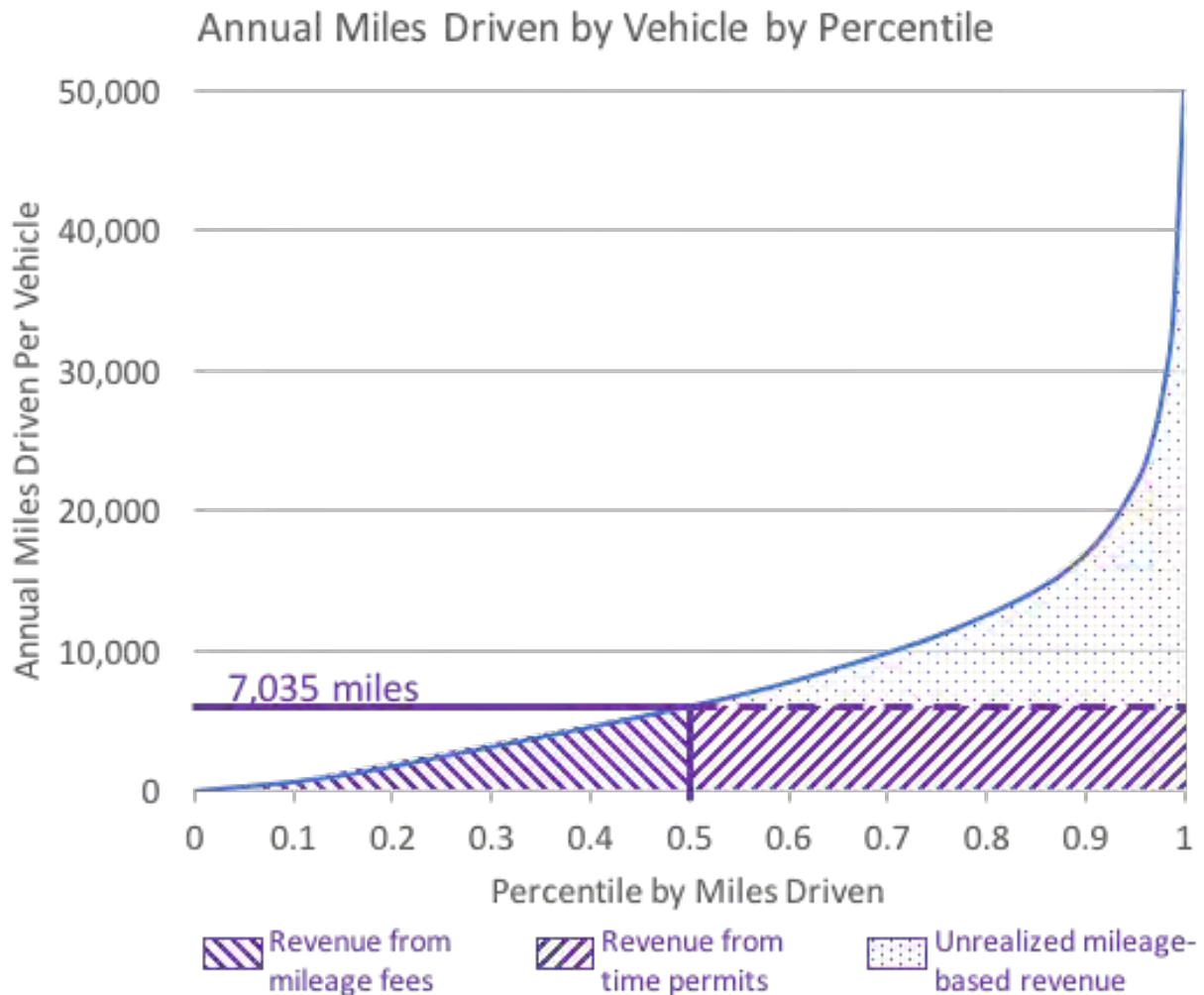
Figure 2. Cumulative distribution of miles driven by Washington vehicles



A possible temptation is to set the time permit rate at a price commensurate with the “average” vehicle, so that the cost is akin to what the average driver would pay under a mileage-based fee. The problem with this approach is that it leaves the entire policy susceptible to gaming. If every vehicle owner were perfectly rational,

those driving fewer than 7,035 miles per year would opt to pay by mile, and those who drive more than 7,035 miles per year would opt to pay for a time permit. Figure 3 depicts this outcome. The triangular, diagonal-shaded area under the curve on the left represents revenue collected from mileage-fees by vehicles driving fewer than 7,035 miles per year. The rectangular, diagonal-shaded area to the right represents revenue collected from time permits priced at the equivalent of 7,035 miles. The dotted area beneath the curve on the right side represents unrealized mileage-based revenue from those high-mileage vehicles opting for time permits, and it accounts for 40% of all miles driven. Thus, setting the time permit rate at the median mileage driven opens the state up to as much as 40% revenue loss compared to a fully mileage-based system.

Figure 3. Revenue impacts of a time permit at 50th percentile mileage



Setting the time permit rate at a higher percentile mileage equivalent reduces the risk of revenue loss caused by this phenomenon. Figure 4 depicts the same phenomenon when the time permit rate is set at the 90th percentile vehicle by mileage, which corresponds with about 18,000 miles. Under this scenario, the dotted area on the upper right under the curve corresponding with unrealized mileage-based revenue is only 9%. If the rate is set higher still, at the 98th percentile, the mileage equivalent is 30,000 miles, and the potential for unrealized revenue drops to 2%.

Figure 4. Revenue impacts of a time permit at 90th percentile mileage

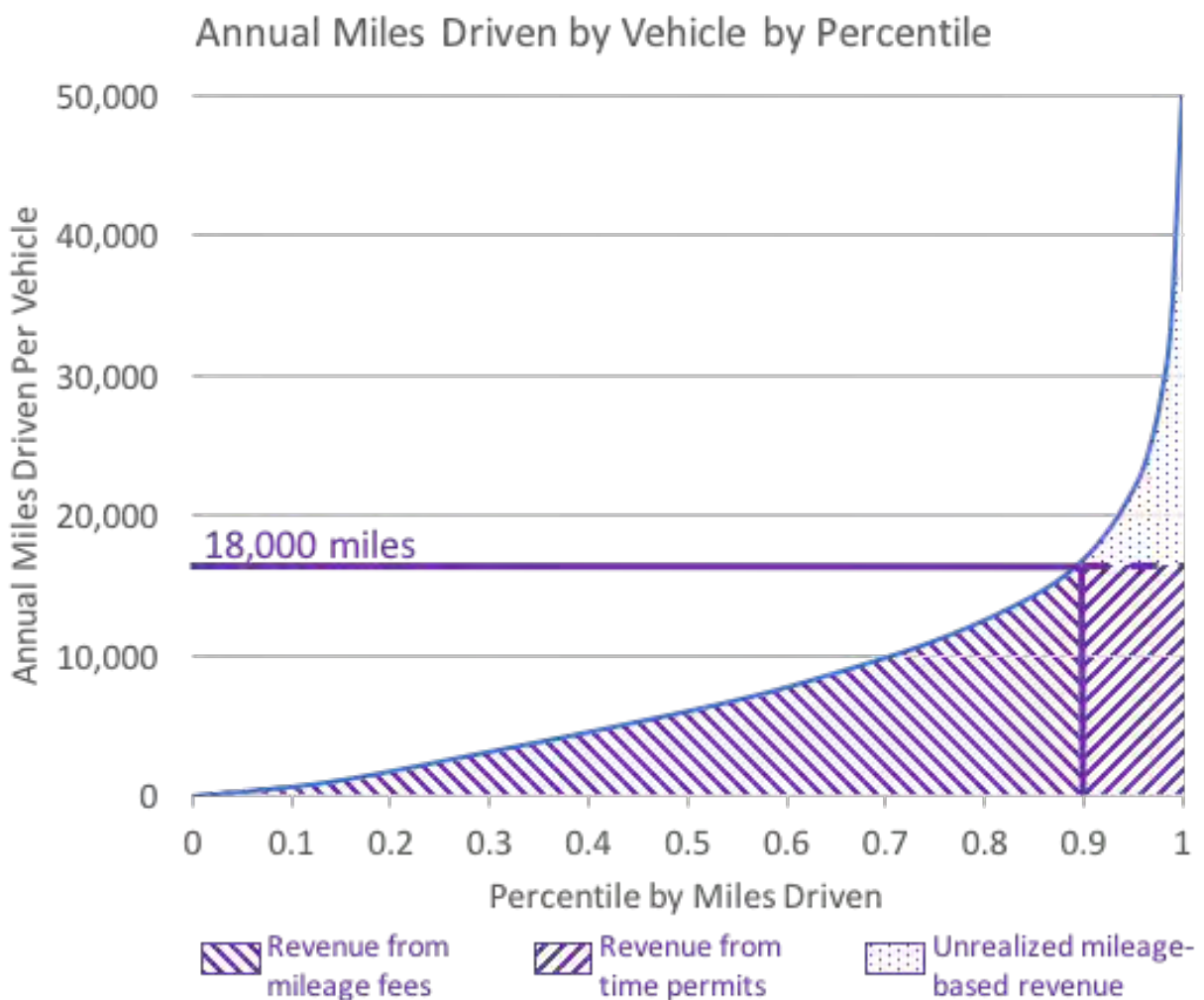


Table 3 summarizes these three possibilities using a per-mile equivalent rate of \$0.024 per mile, as simulated in the WA RUC pilot.

Table 3. Time permit prices and revenue loss impacts at various mileage percentiles

Percentile	Annual Mileage Driven in WA at Percentile	Time Permit Equivalent Price at \$0.024 per mile	Upper Bound of Unrealized Revenue
50th	7,035	\$169	40%
66th	10,000	\$240	16%
90th	18,000	\$432	9%
98th	30,000	\$720	2%

Once a percentile and corresponding annualized permit price are established, shorter denomination prices can be set as well. These rates can either be prorated based on the annual price, or they can be slightly larger than the prorated amount to account for higher transaction costs. For example, if the time permit price is set at the 98th percentile (\$720) for one year, then the prorated rate for a one month permit would be \$60, and the rate for a one week permit would be \$13.84. These could be increased, for example by a flat amount (e.g., \$5) to account for additional transaction costs.

5 EXCEPTIONS

The final step in the rate setting process is to determine exceptions to the rates through exemptions, discounts, or fuel tax refunds/credits. This section discusses each type of exception and its application.

5.1 RUC exemptions

RUC exemptions are an important component of rate setting, because such exemptions determine which revenues are not collected, and thus impact the revenue that a given rate will generate. There are two types of exemptions: vehicle-based and location-based. This section considers each in turn.

5.1.1 Vehicle-based exemptions

Once the legislature determines the class of vehicle upon which to apply RUC, it can consider exempting certain vehicles within that class for various reasons. If the pool of subject vehicles is “all vehicles,” then the possible exemptions are numerous. As the pool of subject vehicles narrows (e.g., “only new electric vehicles”), the possibilities for exemptions likewise narrow.

There are two ways to effectively exempt a vehicle from RUC. The first and preferable way is to define the subject class of vehicles in a clear way to include only those intended to pay RUC. The second way, if the first fails, is to call out specific exemptions in statute.

Any exemptions from RUC should follow a public policy reason for the exemption. One logical class of vehicles to consider exempting from RUC is vehicles not intended primary for use on public roads. For example, purely agricultural vehicles such as combines or farm tractors should be exempt from RUC. Other agricultural exemptions (e.g., driving a truck on a farm) can be covered through location-based exemptions. Other classes of vehicles commonly considered for exemption include emergency vehicles, government-owned vehicles, and public transit vehicles. Under Washington law, all of these vehicles pay at least some fuel tax. The public policy reasons for a RUC exemption are dubious given all these vehicles use roads and contribute to wear and tear. There may be other legal or political considerations for considering such exemptions, such as a prohibition on taxing federal property in the case of US government-owned vehicles. In other

jurisdictions, exemptions for such vehicles do not generally apply, in part due to the complexity of ensuring correct identification of such vehicles for enforcement purposes.

5.1.2 Location-based exemptions

As with vehicle-based exemptions, location-based exemptions can be accomplished either by defining subject locations clearly or, failing that, by carving out explicit exemptions in statute. Likewise, a public policy reason for a location-based exemption is desirable.

Locations of travel that do not involve roads built or maintained with state funds may be exempted from RUC. The primary types of such locations are the following:

1. Out-of-state
2. Private roads
3. Off-road

In order to exempt (never charge for) travel on all of these categories from being charged, location-based technology must be used in vehicle to verify that the vehicle is in fact traveling in these locations. The potential for refunding RUC for drivers using non-location-based options is discussed in the next section.

Other possible candidates for location-based exemptions include travel on US government-owned property (e.g., military bases, Forest Service roads) and tribal lands, although no exemptions or refunds are available for consumption of tax-paid fuel on such roads under present statutes.

5.2 RUC refunds

There are two cases in which it may be desirable for the state to offer refunds for RUC paid: unused time or distance permits (pre-pay charge products) and miles driven in exempt locations using a non-location-based reporting method.

5.2.1 Refunds for unused pre-paid time or distance products

If RUC payers purchase a time or mileage permit that they do not fully use, they may ask to have the unused portion refunded. For example, payers may seek this if the vehicle is sold or destroyed.

- ▶ Sale could result in transfer of the remaining permit time or mileage along with the vehicle.
- ▶ When a vehicle is destroyed, it is reasonable to allow for a refund of remaining miles or time.
- ▶ For a mileage permit, refunding unused miles may be desirable when a vehicle owner moves or sells the vehicle out of state. Providing such a refund should consider the cost of capturing and verifying an odometer reading, relative to the benefit of the policy.
- ▶ In other cases, providing refunds for unused time permit length would encourage RUC payers who are taking brief but long trips to choose the time permit for those days, then switch away when their period of intensive driving is over, potentially paying an effective per-mile rate lower than they would have on a mileage-based product.

5.2.2 Refunds for mileage traveled on exempt locations

RUC payers who do not choose a location-based method may wish to be refunded or credited RUC paid for miles driven on exempt areas, as listed in the preceding section. Refunds could be offered in such cases, but doing so has several drawbacks:

1. Having exact location information is the only way to eliminate the possibility of fraud, so whatever refund method is offered would be susceptible to fraud.
2. In order to reduce susceptibility to fraud, the state would need to require that refund requests include some information (e.g., dates and locations of travel) along with corroborating evidence of exempt travel (e.g., purchase receipts from locations along the route). Thus, it would be a complicated, potentially frustrating process for those requesting a refund.

3. Validating refund claims (verifying internal consistency) may be difficult to automate, requiring substantial staff time (and consequent cost).

Several alternatives exist, by which the state could offer some credit or refund for travel in exempt locations for those that do not choose a location-based method

1. The state could offer a “standard deduction” for all non-location based methods. This assumes, for example, that on average, all RUC payers experience a certain percentage of exempt travel (for example, 10%). As with all refunds and exemptions, this type of deduction would impact the revenue forecasts and potentially increase the RUC rate across the board.
2. The state could offer a supplementary smartphone app usable on long trips, which RUC payers who opt for location-free reporting methods could use to demonstrate their travel is in fact out of state. The WA RUC pilot built and demonstrated this concept (the *MileMapper*).
3. The state could offer a deduction for people who live on private roads, or who have a long driveway that is far from a public road. Such a deduction would require some processing effort (subject to fraud), but less than that required for refunds generally.

5.3 Fuel tax refunds or credits

To avoid double taxation on vehicles subject to RUC, the state can offer fuel tax refunds or credits as long as it collects fuel tax. Lacking any financially-feasible or enforceable gas station technology at present to charge fuel tax to some vehicles and not others, any potential future RUC system will need refund fuel tax paid to RUC payers.

Fuel tax refunds or credits may be processed as follows for the various mileage reporting methods.

1. **Time Permit.** Time permits by design do not involve recording any distance data. Thus, no fuel tax refund should be offered.
2. **Odometer reading and smartphone apps.** These post-pay, mileage-based products require an odometer reading submission, so a fuel tax

refund or credit can be computed by multiplying the distance traveled by the fuel economy of vehicle. While the precise fuel economy that a vehicle achieves depends on driving locations and style, the EPA's combined city-highway fuel economy offers the most accurate, consistent, externally-sourced value.

3. **Mileage permit.** For this pre-pay, mileage-based product, the state cannot afford to give out an unlimited amount of cash up front. Thus, while the price of a mileage permit can be discounted to account for the fuel tax refund (using the same calculation method as used for odometer charge and smartphone apps), it should never be less than zero. Drivers wishing to get a net refund will need to choose another method.
4. **Plug-in Device.** This approach to the post-pay, mileage-based product enables direct measurement of fuel consumption on most vehicles. Fuel consumption is currently not a mandatory field on the OBD port, but it will be added, so that by 2021, all US vehicles will have fuel consumption available on the OBDII port. For the relatively small population of vehicles for which fuel use cannot be computed, fuel tax credits can be based on fuel economy, similar to the other methods. For plug-in devices with location information, fuel tax refunds should only be offered for non-exempt travel, as fuel tax associated with exempt travel may not be exempt under state law.
5. An issue arises when fuel is purchased out of state but used for in-state travel: fuel tax refunds/credits may be offered when no fuel tax was paid to the state in the first place. Indeed, this occurs today near state borders when drivers cross state lines to buy fuel. In cases where a vehicle gets better than average fuel efficiency, and would not be earning a net refund, this may not be a problem, since such vehicles are not paying for their roadway usage today, and would be paying at least something for their usage in the future. But low fuel efficiency vehicles would be getting a bonus in the form of a credit or refund from the state that they are not receiving today. There is no technical solution to this challenge. However, the legislature can choose not to apply RUC to vehicles with low fuel economy,

or it could choose not to offer net refunds for fuel taxes paid (i.e., RUC could be fully covered by a credit, but it would never lead to a refunding of cash).

APPENDIX A: APPROACHES TO RUC RATE SETTING IN OTHER JURISDICTIONS

A.1 Introduction

With relatively few systems in the United States and internationally for light vehicles, there is little experience in RUC rate setting. In the United States, the leading jurisdiction is Oregon (discussed in Section 0), given its experience both in light and heavy vehicle RUC over many years. Other jurisdictions have rate setting methodologies for gas taxes and tolls, but these are not easily translatable to RUC.

The remainder of this section covers international examples. New Zealand is the only jurisdiction with distance-based RUC for light vehicles, and has a long-established approach of cost responsibility that applies to RUC and fuel taxation in parallel. In Europe, there are rate setting approaches for time-based RUC for light vehicles and distance-based RUC for heavy vehicles.

This section concludes with a brief mention of an emerging methodological advance in rate setting for road taxation from Nebraska.

A.2 New Zealand

A.2.1 Background on New Zealand Road User Charging

New Zealand assesses a fuel excise tax only on gasoline, not diesel. Consequently, since 1978, New Zealand's Road User Charge (RUC) system has charged all diesel and heavy (over 3.5 metric tonnes) vehicles a weight and distance fee for travelling on public roads.

Light diesel vehicles (which includes any commercial vehicles with a maximum legal weight of less than 3.5 metric tonnes, as well as private automobiles) must purchase a RUC license with prepaid distance to cover future travel, similar to the mileage permit concept tested in the WA RUC pilot. Vehicle owners must purchase distance in 1000km increments, with no upper limit (e.g. 100,000km can be purchased at once). The first distance license should match the odometer

reading of the vehicle upon registration. The current rate is NZ\$0.062 per kilometer (approximately US\$0.068 per mile, nearly triple the rate used in the WA RUC pilot) for light vehicles (up to 3.86 US tons).⁶ About 41% of revenue raised in New Zealand from road users comes from RUC (for both light and heavy vehicles), and all revenue is directed by law to the National Land Transport Fund (NLTF).

A.2.2 Process for setting RUC rates in New Zealand

The five-step process for setting RUC rates also applies to the setting of fuel excise tax rates in New Zealand.

1. New Zealand Transport Agency (NZTA) prepares a three-year program of projected future NLTF road expenditures, separated by category (e.g., state highway maintenance, local road improvements), with input from local authorities;
2. NZTA forecasts future traffic volumes by vehicle category over the three-year period, measured by distance;
3. The Ministry of Transport (MOT) applies its Cost Allocation Model (explained in Section 0) to calculate how the Government should raise needed revenues from each category of vehicles, based on economic principles (e.g., relative impact on road maintenance, types of vehicles to benefit from different types of spending);
4. MOT uses the results of the Cost Allocation Model to develop proposals for changes to RUC and fuel tax rates to the Minister of Transport to meet projected spending estimates;
5. Cabinet makes the final decision on changes to RUC and fuel excise tax rates.⁷

A.2.3 Revenue forecasting and traffic forecasting

As the public body responsible for allocating funds from the NLTF, the NZTA budgets a three-year program of spending. It funds both national highways (which

⁶ Higher rates apply for heavier vehicles, and also vary based on the wheel/tire configuration.

⁷ Parliamentary assent is subsequently needed as part of the budgetary process, but legislation does not authorize Parliament to amend the detail of the rate changes. It can merely approve or reject them.

it manages itself) and contributes funding to local authorities for their road networks and contracted public transport services.

Spending is separated into activity classes, such as the ones listed in Table 4.

Table 4. Sample New Zealand NLTF expenditure categories

Road maintenance	Funding to maintain and operate the road network to a minimum standard, including renewals, against asset management plan objectives.
Road improvements	Funding for capital improvements to the road network to meet safety, congestion and access objectives.
Promotion of road safety	Funding to promote safe and efficient use of the transport network, through education, advertising and provision of public information.
Road policing	Funding for the Police to patrol and enforce road rules.
Investment management and transport planning	Funding for planning, research and development, to support the development of land transport programs.

NZTA and local authorities prepare three-year land transport program forecasts for their respective activities, based on detailed criteria to justify the scale and types of spending sought. NZTA undertakes an assessment of these forecasts, which typically includes requiring additional information and preliminary decisions to approve or reject some elements of land transport programs. These are compiled into a forecast of total spending for each year, broken down by activity category. Some spending will cover activities already been committed for in previous years, such as completion of major construction projects and continued funding of long-term maintenance contracts. This is prioritized for any future revenue. A three-year program is developed based on delivering best value for money to achieve the strategic outcomes of the government around land transport (these may include

reducing congestion, improving road safety, improving network resilience, and encouraging use of other modes).

NZTA forecasts future traffic volumes based on data it collects from road network traffic counts, from local authorities, and the data behind revenue collected from fuel tax and RUC over recent years. It projects traffic over three years, taking into account expected population growth, economic growth, and trends in vehicle usage and ownership. It uses this data to project expected revenues from RUC based on *existing* charge levels, and identify what can be funded from the three-year program with existing revenue, and what additional revenue would be needed to fully fund the program.

A.2.4 Rate setting based on cost allocation

To set charge rates, MOT inputs forecasted traffic demand and projected expenditures into a Cost Allocation Model. That model calculates what proportion of each expenditure category should be allocated to different types of vehicles based on a number of factors summarized in the table below.

Table 5. New Zealand's cost allocation model treatment of elements

Description	Cost allocation model treatment
Fixed costs not attributable to road use, such as weather-related wear and tear, administrative costs, and policing	Allocated to all vehicle types in equal proportions
Projects to increase network capacity	Allocated to vehicles based on road occupancy (using passenger car equivalent units)
Projects to benefit specific vehicle types	Allocated to the class of vehicle benefitting
Maintenance and replacement of infrastructure based on vehicle mass	Allocated to vehicles according to their relative impact based on equivalent standard axle mass

The model produces proposed rates for RUC that vary according to the various categories of vehicle in the charge tables. The model then proposes a rate for fuel tax by converting the distance-based RUC rate for light vehicles to a fuel-based rate for gasoline powered light vehicles based on their average fuel efficiency (based on data from the Motor Vehicle Register about the age of vehicles in the fleet).

MOT regularly reviews and updates the model, including its calculations and underlying assumptions, to ensure it reflects latest research on the impacts of vehicle types on the network, the relative benefits different types of road projects have on vehicles, and economic research on cost allocation principles.

A.2.5 Forecast revenue based on revised rates

Using the proposed revised RUC rates, MOT undertakes revenue modeling to estimate how much revenue would be generated from them. This takes into account elasticities of demand (i.e., how much less will people drive if the rate increase goes into effect) based on historic data of the impact of rate increases on vehicle distance traveled. MOT uses revenue modeling in concert with cost allocation modeling to develop a rate structure that should generate the intended levels of revenue for the forthcoming three years. MOT uses these outputs to advise Cabinet on what (if any) rate changes are needed to fully fund the forthcoming three-year National Land Transport Programme. If Cabinet does not support the proposed changes, then the proposed three-year program will be amended accordingly, with NZTA prioritizing spending according to its own appraisal framework.

A.2.6 Regular revisions

Every year, the forecast revenues are updated based on actual revenues received, and changes in traffic demand, to reduce the risk of surprise from revenues excessively below or above expectations. Typically, if revenues are below forecasts, NZTA will manage the program of expenditure to meet the reduction, with discretionary projects likely deferred. If revenues are above forecasts, additional projects may be funded prudently. As the next three-year funding cycle approaches, the process is repeated to revise rates taking into account intended spending, inflation, and traffic demand.

A.3 European vignette systems

European vignette systems are included as an example because they are a product analogous to the time permit, although in Europe they only allow for travel on highways, not all roads.

Eight countries in Europe charge light vehicles a time-based pass (known as a "vignette") to use their main roads—limited access highways, and in some cases major arterials.⁸ Such passes are similar to the Washington RUC concept of a time permit—unlimited use for a specific period of time—but differ in the sense that they only are needed for access to motorways and other principal roads, not for minor arterials, residential, or rural roads. Enforcement techniques vary from country to country, but most include visual roadside inspections, or the use of Automatic License Plate Recognition (ALPR) cameras to match passes to number plates of passing vehicles.

Although the original purpose of vignette systems was to raise revenue from foreign road users (because they neither pay registration fees nor necessarily much fuel tax when they visit or transit other countries), they apply both to vehicles registered within each country and any visiting foreign vehicles equally under EU law and treaties. They have become a cost-effective way of raising revenue for widespread use of highway networks, without the need for tolling infrastructure.

All of the countries with vignette systems also have fuel taxes, but this has little relationship to the setting of vignette rates. There appears to be a closer relationship between annual vehicle registration and licensing fees, and the establishment of vignette systems. Typically, as countries have introduced vignettes on foreign vehicles, they have reduced registration and licensing fees on resident vehicles. This has effectively spread the cost of raising revenue for the road network from residents only to include non-residents.

⁸ The countries with light vehicle vignettes are Austria, Bulgaria, Czech Republic, Hungary, Romania, Slovakia, Slovenia and Switzerland. Germany has such a system under development.

With the exception of Switzerland (which applies a single rate for annual access to its motorway network), all countries with light vehicle vignettes offer short, medium and long term passes to pay to use their main highway networks. A single vignette will typically apply to all main roads in the country for the period of the pass. Vignettes have a range of products that correspond as to whether a user is a resident (using the roads regularly) or a visitor for various durations. Table 6 summarizes rates across Europe.

Table 6. European rates for light vehicle vignettes

Country	Duration of vignettes	Prices ⁹ (private cars only) ¹⁰
Austria	10 days/2 months/annual	\$10.52/\$30.66/\$102.04
Bulgaria	weekend/1 week/1 month/3 months/annual	\$5.85/\$8.77/\$17.55/\$31.59/\$56.74
Czechia	10 days/1 month/annual	\$13.87/\$19.68/\$67.10
Hungary	1 week/1 month/annual	\$12.40/\$16.93/\$152.27 ¹¹
Romania	1 week/30 days/90 days/annual	\$3.43/\$8.01/\$14.87/\$32.03
Slovakia	10 days/1 month/annual	\$11.44/\$16.01/\$57.20
Slovenia	1 week/1 month/annual	\$17.16/\$34.32/\$125.83
Switzerland	annual	\$40.62

A.3.1 Approaches to rate setting

There is no uniform approach to rate setting in each country, but countries generally take one of two approaches:

⁹ Converted to US\$ at market rates as of 15 January 2019.

¹⁰ Different rates can apply for motorcycles and light commercial vehicles such as vans.

¹¹ A separate cheaper regional only annual vignette is available for vehicles that travel only on roads within a region of the country.

- ▶ Use of a cost responsibility approach, to forecast revenues needed to sustain the road network, estimating what distance would be traveled by various types of road users, and allocating costs by vehicle type, to determine charge levels based on the period of each product;
- ▶ Forecasting maximum revenue able to be generated for various categories of road users based on forecasted demand and the effect of vignette levels on demand.

Most countries forecast revenues needed to support the maintenance and renewal of the roads being charged. A cost responsibility study is undertaken to develop a forward-looking cost base for the roads to be charged. The model establishes what proportion of costs for the roads should be charged to light vehicles compared to heavy users, and is then used to inform how the charges to light vehicles should be allocated between various types of users including high frequency users and occasional users such as visitors.

Annual rates are developed based on the average distance traveled on the network by vehicles registered in the country, divided by day. The rates for shorter intervals are based on surveys and other sources of estimates of distance travelled by visiting vehicles (including data from providers such as Google). For example, a vehicle purchasing a one-week vignette would typically travel more distance during that one week than a similar vehicle with a one year vignette, as it could either be visiting and making multiple journeys, or be transiting the country (traveling across the network). By contrast, many vehicles with an annual vignette may not travel any distance for several days and may only make long trips occasionally.

Instead of a cost responsibility approach, some countries treat the setting of vignette rates as an exercise in revenue maximization, and use data on vehicle usage by both resident and foreign vehicles to estimate what rates would generate the greatest revenue, taking into account demand elasticities for various user groups. Annual vignettes have a distinct impact, as they are effectively permits for residents to use the highway network and so are part of the costs of owning a vehicle. On the other hand, foreign visitors almost exclusively buy short-term vignettes, so they can sustain higher rates unlikely to deter visitors from making a single trip, nor invite opposition from residents.

Geographical location has been a key factor in vignette rate setting. For example, Slovenia has charged the highest short-term vignette of any country because it has the only direct routes from Central and Western Europe to the coastal resort locations in Croatia, the western Balkans, and for visitors to Greece. It charges a one-month vignette at double the rate of the one week vignette, to encourage visitors to remain in the country over a vacation period, as it is highly likely that those transiting the country over one week will need to transit back. By contrast, Switzerland actively discourages visiting car traffic, due to congestion and environmental concerns, as it is already a country with high levels of transit traffic between Germany, Italy, France and Austria.

The European Commission has expressed concern that some charge rates for short trips are disproportionately high, as under European Union law it is prohibited for EU Member States to discriminate against visitors (including their vehicles) registered in other EU Member States.¹²

A.4 European heavy vehicle RUC rate setting

Ten countries in Europe apply RUC to heavy vehicles, charging them by distance, location and size¹³. Under EU law and treaty, the rates for such systems must apply principles of cost responsibility, so that RUC for heavy vehicles is not used as a means to tax heavy vehicles excessively for their use of the roads, hindering free trade and the movement of goods within the European Single Market. To meet this requirement, countries apply cost accountancy-based methodologies to establish the basis for setting charge rates. The key steps in the process include:

- ▶ Valuate the road network and identify operating costs;
- ▶ Forecast vehicle traffic split into categories used to set charge categories for rate setting;
- ▶ Apply cost responsibility principles to determine how costs under each cost category should be allocated between various types of vehicles;

¹² See detailed report on private vehicle vignette systems at <https://ec.europa.eu/transport/sites/transport/files/modes/road/studies/doc/2012-02-03-impacts-application-vignette-private-vehicles.pdf>

¹³ Either by maximum allowable weight or numbers of axles.

- ▶ Develop charge rates based on recovering the full life-cycle costs of the network based on forecast vehicle traffic (taking into account any elasticity of demand influenced by applying charge rates);
- ▶ Apply any additional factors to charges, such as rates varying based on environmental impact.

A.4.1 Valuation of road network

In Europe, the two main techniques of estimating infrastructure costs are the Perpetual Inventory Method (PIM) and the Synthetic Method (SM). The PIM assesses the total value of the road network based on past capital spending on the network. Historic spending on the road network is capitalized and depreciated to establish the value of capital spending today. For example, a bridge may have a depreciated life of 40 years, so if it were paid for 20 years ago, it would be valued at half the initial price due to depreciation. For any assets that are fully depreciated (e.g., spending on earthworks for a highway of a century ago), costs are not included as they are sunk. The depreciated value also needs to include a calculation of the opportunity cost of that capital, being the interest rates that would apply to that capital in each year.

The SM estimates the cost of replacing the existing network today with the same assets of a similar quality (including the current level of wear and tear on those assets).

In both cases, the capital costs of the network are amortized on an annual basis, to establish how much expenditure is needed to recover the costs of the network in a sustainable, forward-looking way. A number of approaches are available to calculate the amortization of such costs. Some assets may be amortized according to actual consumption (e.g., pavement), while others may be linear (based on an operating life). The table below outlines examples of various approaches to amortize such costs.

Table 7. Examples of amortization approaches for highway assets

Type of asset	Type of depreciation	Reason
Pavement	Usage, exposure based with reference to heavy traffic volumes, climatic conditions and design	Pavement deterioration is directly a function of design, usage and exposure to the elements, so will vary considerably
Base layers	Progressive or usage based.	Base layer deterioration likely to accelerate as traffic increases.
Bridges	Linear by value or progressive	Deterioration tends to be a function of design and age, although higher volumes of heavy traffic can impact on life expectancy
Tunnels	Linear by value	Little deterioration over time
ITS systems	Linear by proportion	Higher loss of value in earlier years as technology-based assets lose value greatest in initial period
Earthworks	Linear by value	Little deterioration over time
Land	Special treatment	Land tends to appreciate in value, although land under a road tends to have no realistic alternative usage if it provides access to adjacent land

A.4.2 Operating costs

Once capital costs are calculated, operating costs for the year or years in question are estimated. These are based on budgeted estimates for the costs of managing the network and minor repairs as they become necessary. Operating costs might include:

- ▶ Administration;
- ▶ Energy, water, telecommunications and other utility services;
- ▶ Consumables (e.g. stationery, grit/salt);
- ▶ Staff training and activities not construction project specific;
- ▶ Costs of collecting, communicating and enforcing RUC;
- ▶ Cleaning, painting, clearance of flora, rubbish collection along corridors;
- ▶ Replacement of assets of relatively low value (e.g. lightbulbs, fixed signs);
- ▶ Minor repairs (e.g. shoulder and median barrier repairs, road furniture repairs, drainage system clearance);
- ▶ Structural repairs (e.g. reinforcement of bridge superstructure, repairs to tunnel lining); and
- ▶ Road surface patching (e.g. potholing, localized resurfacing).

A.4.3 Forecast traffic volumes

Traffic volumes are forecast for coming years based on existing volumes, and inputs regarding population growth, economic growth, and other trends in economic development and transport use. These are applied to each category of vehicles to enable allocation of forecasted capital and operating costs to vehicle categories on a per vehicle-kilometer basis.

A.4.4 Cost responsibility

Both capital costs and operating costs are subject to cost responsibility principles to determine how costs can be allocated according to the following factors:

- ▶ Non-vehicle specific costs (costs that are overheads not attributable to any specific vehicle type or road use);
- ▶ Vehicle type specific costs (costs that can be attributed to specific types of vehicles, such as heavy or light vehicles, because they are the primary beneficiaries of specific assets, such as truck parking bays);
- ▶ Vehicle size specific costs (costs that can be attributed based on vehicle road space occupancy, such as projects to increase road capacity); and
- ▶ Mass related costs (costs that can be attributed to the weight of a vehicle, such as the design standards for a bridge or wear and tear on a road surface).

Non-vehicle specific costs are divided among all types of vehicles by an equal amount on a per-vehicle-kilometer basis. Vehicle-type-specific costs are only divided among the vehicles that they can be attributed to, on a per-vehicle-kilometer basis. Vehicle-size-specific costs are divided according to road space occupancy. Typically, a private car has a value of 1, motorcycles have a value of $\frac{1}{2}$, and trucks and buses have values of 2-3 depending on size. Mass-related costs are divided according to the average mass of vehicles of different categories on an equivalent standard axle mass basis, and are only applied to heavy vehicles.

A.4.5 Develop charge rates

Once the costs are allocated to all vehicle categories, charge rates can be readily calculated on an annual basis, taking into account demand elasticities of the impacts of rates on traffic demand. These charge rates are typically set for a multi-year period, so that there is some rate certainty for at least three years, but with regular revisions based on actual traffic levels to ensure that revenue targets are being reached and not exceeded.

In recent years, EU law has been amended to allow countries to apply environmental factors to RUC rates, but only on objectively defined criteria (e.g., emissions from specific ratings of EURO engines). These factors may be added to charge rates designed to recover infrastructure costs, and might also include higher charges for peak time road use to reduce congestion (e.g., Czechia applies higher charges for Friday afternoon use of the motorway network, due to high demand).

Each country has its own national process for approving rate changes, which may be done by Parliament, by Ministers, or by the relevant national highway company¹⁴ for later political ratification.

¹⁴ All of Austria's motorways are owned and operated by a Federal company called ASFINAG, which is required to raise all of its revenue from road users through types of RUC, and to borrow its own capital to pay for capital projects. It recommends RUC rates which are ratified by the Federal Government, but are all collected by ASFINAG itself.

A.5 Nebraska Fuel Tax: a small step towards a forward-looking cost basis

Outside of Oregon, no state conducts a regular cost allocation or cost responsibility study.

However, Nebraska has taken a small step toward a forward-looking (needs-based) cost basis in its transportation funding approach. Nebraska's fuel tax has three components, described by Open Sky Policy¹⁵ as follows:

- ▶ A **fixed tax** set by the Legislature, currently 16.3 cents/gallon
- ▶ A **wholesale tax** based upon five percent of the average wholesale cost of fuel in the previous six-month period, currently 10.7 cents/gallon
- ▶ A **variable tax**, which is set by the Department of Transportation Director at an amount to meet the appropriations made from the Highway Cash Fund by the Legislature, currently 2.6 cents per gallon

To the extent that the legislature's choices are forward looking / needs-based, the third component of the tax is forward-looking and needs-based. However, it currently represents about 9% of the total fuel tax, limiting the scope of the needs-based approach.

¹⁵ <https://www.openskypolicy.org/policy-brief-lb-941-and-nebraskas-gasoline-tax>



A-16

COMPATIBILITY OF RUC & TOLLING
IN WASHINGTON STATE

 **WA RUC**



Compatibility of RUC and Tolling in Washington



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1 INTRODUCTION

The Legislature directed the Washington State Transportation Commission (WSTC) to examine the concept of road usage charging (RUC) as a potential replacement for state gas taxes in 2012. RUC – which charges drivers based on the distance driven instead of fuel consumed. To oversee the examination of RUC, the Legislature directed WSTC to create a Steering Committee, which has met continuously since 2012, formulating and analyzing questions around the viability of RUC, culminating most recently in the design and launch of a large-scale, statewide, year-long pilot test (“WA RUC”) in January 2018.

Since 2012, the RUC Steering Committee has regularly identified policy issues for further development, including the need to assess the compatibility between a prospective Washington RUC system and the existing state tolling system. The tolling system, branded as *Good To Go!* and operated by the Washington State Department of Transportation (WSDOT), consists of in-vehicle transponders for detection of toll events across several highway and bridge facilities, account management, and customer service. This policy paper represents the output of the compatibility assessment. This report is distinct from the investigation within the WA RUC pilot itself of interoperability between RUC schemes across multiple jurisdictions (Oregon, Idaho, and British Columbia). While there is some conceptual overlap, these two distinct workstreams should not be confused with one another.

The primary output of this paper is a set of high level policy principles. In arriving at these principles, we explore several possible models for compatibility of tolling and RUC in order to validate that the policy principles are achievable and logically sound. We begin this paper by exploring RUC and tolling, their basis for charging, their differences, and their similarities. We then expand on what compatibility can achieve (its objectives) and its potential benefits before exploring the associated challenges. We then set out several models for compatibility and consider them in relation to the benefits and challenges. Finally, based on the analysis of the several models, we derive high-level policy principles for pursuing compatibility between RUC and tolling in Washington.

2 BACKGROUND

2.1 *Good To Go!* and WA RUC

Good To Go! is the electronic toll collection system WSDOT uses on the four current toll facilities in Washington. *Good To Go!* customers prepay a balance into an account, with tolls electronically deducted as users pass through toll collection points. Automated License Plate Recognition (ALPR) captures unregistered transactions and sends a bill by mail to customers. This tolling operation provides a funding mechanism for the specific tolled bridges and express lanes.

RUC, if implemented, would replace the gas tax with a per-mile charge. RUC aims to ensure sustainable, long-term funding of road maintenance while preserving the “user pays” principle embodied by the gas tax.

Despite their technical and policy distinctions between RUC and tolling, drivers may perceive the two systems as the same or similar. Drivers, especially those with existing toll accounts, could perceive RUC as an added inconvenience to the current tolling system. The absence of compatibility between tolling and RUC may reduce the public acceptance of both systems. Likewise, compatibility between tolling and RUC could offer user benefits that increase public and political acceptance. Section 4 describes the differences between RUC and tolling in more detail.

2.2 What is compatibility?

Compatibility refers to the ability of two or more systems to co-exist harmoniously. For users, compatibility could manifest itself in many ways, from the ability to manage and pay tolling and RUC charges with the same payment mechanism to full integration of reporting methods and accounts, potentially including the integration of payment mechanisms for other modes of transport such as parking, ferries, and transit, and even other services.

Interoperability is a closely related term of art adopted in the tolling industry in the early 21st century when it became necessary for tolling technology (e.g., in-vehicle tags and overhead tag readers) and billing systems to interact. Today, interoperability more generally means the ability of motorists to use a single method of payment and reporting for road use across facilities owned by various

authorities. It also tends to involve the reconciliation of revenue from motorists between those collecting the tolls and those entitled to the revenue.

In tolling, the absence of interoperability, and compatibility more broadly, increases the burden on road users who may have to make separate payments to separate entities and who, in some cases, even need multiple in-vehicle devices. The introduction of RUC in Washington will require customers to set up, manage and interact with another service, and for some customers this would be in addition to their existing *Good To Go!* account. To determine whether Washington can avoid non-compatibility between RUC and tolling, we introduce and explore in this paper varying degrees of compatibility that may evolve over time.

2.3 Longer term vision for integration of mobility services

While this paper deals specifically with the issue of compatibility between RUC and *Good To Go!*, the issue of interoperability between RUC schemes across multiple jurisdictions is also being investigated within the WA RUC pilot. Further still, there are possibilities for Washington to foster collaboration between transport operations within the state and beyond. For example, the possibility of closer integration between *Good To Go!* and ferry operations has been investigated previously and could be extended to include RUC. Transport authorities globally are increasingly looking at how mobility for citizens can be enhanced through integration of a wide range of services, for example through a single payment platform. But, as far as compatibility between RUC and tolling, the purpose of this paper is to enumerate options that respect the distinct policy purpose of each system.

3 OBJECTIVES, BENEFITS AND REQUIREMENTS

3.1 Objectives

The RUC Steering Committee highlighted 13 guiding principles for WA RUC. In relation to compatibility, they stated the following:

Washington road usage charge should strive to be interoperable with systems in other states, nationally and internationally, as well as with other systems in Washington. Washington should proactively cooperate and collaborate with other entities that are also investigating road usage charges.

This is the guiding principle which leads us to investigate the options for and feasibility of compatibility with *Good To Go!*, the tolling system in Washington. Based on an analysis of available documentation and through internal discussions, the following objective for compatibility between RUC and tolling has been identified:

To address an unexplored policy question about RUC by identifying the pathways toward a simplified user experience.

We have linked this objective very specifically to addressing an outstanding issue with RUC although it could equally be stated in terms of enhancing the user experience of tolling customers. Providing a more integrated and easier service to users removes a potential complaint about RUC or tolling, namely, that it represents an additional burden and inconvenience on the public.

3.2 Benefits

In fulfilling the objective above, Washington could achieve the following additional benefits:

- ▶ Improve collection rates for both RUC and *Good To Go!*; and
- ▶ Reduce operational costs for both RUC and *Good To Go!*

Even the simplest forms of compatibility imply account-based user models, web-based contact, and/or automated, electronic payments. These all lead to higher levels of compliance and payment and lower likelihood of costly enforcement than unregistered, manual models. Also, there is less need for human intervention on the part of operators dealing with customer service issues. The availability of a compatible service will also attract users.

3.3 Requirements

The requirements for compatibility are similar to the requirements for RUC and tolling more distinctly. Any system for charging for road usage must be clear, be simple to understand, provide all information that the customer needs, and present information in an easily digestible format. In a compatible system, in particular, users will expect a clear distinction between RUC charges and tolls.

A compatible system must be accurate and reliable in order to instill confidence in its constituent parts and underlying policies, while minimizing the need for corrective action and human intervention. Accuracy is not just about errors in the system, however, but is also about the input data relating to the vehicle, its classification, usage information, and ownership information. Successful compatibility requires that both WA RUC and *Good To Go!* work from consistent information.

There are various other requirements in relation to technology, common business rules and standards, levels of service, security, data privacy, and commercial matters. Each requirement must be addressed to varying degrees, depending on the model chosen, in order to achieve compatibility. We explore challenges to compatibility in the next section.

4 CHALLENGES TO COMPATIBILITY

The desirability of compatibility, having considered its benefits, depends also on the challenges to its implementation. Careful evaluation of ‘for and against’ will support coherent policy.

4.1 Agreements and common rules

There are various entities involved in the process of making two systems compatible, with various interdependencies between them. Parties may rely on each other for payments, the format and quality of information provided to customers, technology standards, levels of service, and more. A tolling agency may need payments at a certain frequency, a transaction hub may require certain interfaces and file formats in order to process transactions, and a service provider may require a particular level of compensation.

In order for this process to be effective and efficient, agreements are required between the various entities so that everyone knows what is required of them and so that each entity can be held accountable for a failure to perform in accordance with the agreements. Where commercial organizations are involved, commercial agreements or contracts are necessary. Where government agencies are involved, memoranda of understanding may suffice. In either case, the following principles should apply:

- ▶ Requirements, responsibilities, and obligations are set out clearly
- ▶ Levels of performance are defined
- ▶ Appropriate remedies are in place for when there is a failure to meet the agreed requirements
- ▶ The nature of the relationship between the parties is not the only determining factor in the form of agreements that are required.

Relationships may be informal where a basic level of collaboration is required while closer interdependencies, particularly of a commercial nature, drive a need for formal contracts.

The process of crafting agreements satisfactory to all parties can be difficult for several reasons. First, the issues addressed may be complex. Secondly, the

interests of the various parties are unlikely to align. Leadership is required to create the contractual apparatus and to bring organizations together to reach compromise. Certain matters may be more appropriately addressed bilaterally while others may require multi-lateral agreements. This is the case, for example, in Ireland where there is a multi-lateral agreement setting out common rules in relation to matters such as information exchange, while there are bilateral agreements dealing with levels of service to be provided by RUC service providers and fees to be provided by toll operators.

Fortunately for Washington, the entities involved in tolling are the same entities most likely to be responsible for RUC, and they already work together: WSDOT, WSTC, and the Department of Licensing (DOL). With legislative direction and a framework for compatibility spelled out in statute, the necessary parties can build on their collaboration to date on tolling and RUC to achieve the necessary inter-agency agreements and common operating rules.

4.2 Operational

Some inherent features of RUC and tolling will lead to operational differences in how the respective services are provided. Such differences will limit the potential for compatibility between the two systems.

- ▶ Tolling is based on discrete transactions where RUC is based on continuous usage. They are likely, therefore, to have different payment models, while the interaction between users and their service provider will also differ, particularly in relation to disputes.
- ▶ RUC may be post-paid, with the user getting invoices for the distance traveled in a given period. Tolls, on the other hand, are often paid via auto top-up, with deductions from a stored card on the account for each transaction. Such differences can prove confusing for customers and lead to a greater level of inward contact in the form of queries and disputes to the call centers.
- ▶ The enforcement processes may also be different. A tolling operator is likely to engage with users in order to recover toll payments and ensure that fines are paid. They may choose to exercise some leniency in so doing. However, non-payment of fees could be considered a form of tax

evasion and is therefore likely to be approached more severely. The enforcement process itself and how the customer service and account management functions interact with the enforcement service are also likely to result in different operational practices.

- ▶ RUC and tolling must work off consistent information in relation to users and their vehicles. This will very likely involve a look-up to the DOL vehicle registry, which WSDOT already has in place for tolling. The manner of this interface for tolling and RUC should be similar, both to ensure that customers receive a common experience with consistent information portrayed about their accounts with DOL, tolling, and RUC, and also to minimize the level of effort and complexity on DOL.

The extent to which differing operational processes affect compatibility depends on the degree of compatibility sought. Under a model with a single service provider taking payments for both RUC and tolling and providing an integrated customer service, the effect of these differences will be more acute and will demand a higher level of operational performance than would be the case where RUC and tolling remain as distinct services.

4.3 Legal

The legal processes for RUC and tolling will be different. Again, this particularly relates to enforcement and failure to pay. This could be in relation to anything from the standard of evidence to be provided or the steps to be taken when issuing legal proceedings. Whatever form compatibility takes, particular care will be needed to ensure strict adherence to what are likely to be different legal processes.

4.4 Governance

In an interoperable environment where there are interdependencies and associated contracts and agreements between various entities, it is necessary that governance is provided at the right level to provide the necessary oversight and control. This will help to ensure that the ecosystem functions effectively. Processes will need to be established to ensure that risks are managed, issues are communicated and escalated, disputes are resolved and guidance and

direction is provided. It will also require representation from the various entities involved in interoperability.

4.5 Technology

The current technology used to capture RUC transactions in the pilot program includes:

- ▶ Pre-paid mileage permits reconciled with odometer readings via remote image capture
- ▶ Post-paid odometer readings via remote image capture
- ▶ Post-paid OBD-II mileage reporting
- ▶ Smartphone app mileage reporting

The specific applications being tested are not currently capable of capturing toll events, and the technology used to capture toll events is not capable of capturing the distance traveled necessary for RUC. *Good To Go!* currently uses RFID technology (and ALPR for unregistered users) to capture vehicle passages. For the moment, two separate mechanisms are required to capture the journeys but, in the future, opportunities for the use of a single device, such as an RFID tag embedded in a GNSS module could be explored. It is feasible, particularly with the OBD-II option and possibly with smartphone, for RUC devices to identify tolling facilities and, effectively, to capture toll events. While this may require some adaptations to the technology, it presents the opportunity to allow users a single device to capture both distance travelled for RUC purposes and toll events for toll purposes. In fact, some OBD-II devices (including one of the devices being tested in the WA RUC pilot), and smartphone applications are used for reporting toll events in several jurisdictions around the U.S. The opportunity to integrate RUC measurements with such technologies is promising and merits further exploration.

Whether peer-to-peer or peer-to-hub-to-peer, compatibility may require the exchange of data between IT systems or back offices of both tolling and RUC. This will create the need to establish interfaces, decide file formats, and establish security and privacy standards. There is no obvious downside to designing a RUC system to accommodate data exchange with *Good To Go!*, or, indeed, other systems.

Change can be costly and disruptive and this needs to be considered when evaluating compatibility. The degree of change will depend on the design of the systems, the form of compatibility to be pursued and the degree of willingness of the parties involved.

4.6 Cost

Expanding on the issue of cost, achieving and maintaining compatibility will have costs that will vary depending on the degree of compatibility that exists. If we envisage compatibility as a process through which tolling and RUC operate independently but with co-operation on certain initiatives and sharing of information, there is little cost involved but with some benefit. On the other hand, deeper integration of operations, through something like the ‘one service’ model described below, will be more expensive to implement and maintain but may, potentially, result in financial savings over time. It is important that, whatever form of compatibility is chosen, there is careful consideration of the costs and benefits. It is also worth reflecting on the costs and benefits from a broader transportation perspective rather than focusing on the narrower effects on tolling or RUC individually.

4.7 User perception

WA RUC is addressing the broad issue of user acceptance of RUC, including the various challenges that come with the concept of RUC. Despite the very distinct policy purposes and operational statuses of tolling and RUC, the very notion of compatibility may heighten sensitivities among users or stakeholders that tolling and RUC are synonymous. Users may feel that they are simply being charged more for the same thing. Of course, this perception also depends on the model of compatibility ultimately pursued: communicating tolling and RUC charges distinctly, along with the purpose of the two charges, could help ameliorate concerns.

Compatibility introduces some risks to data privacy, through the exchange of data between different entities. Perceptions of privacy risks have had an impact on RUC acceptance at the state level. In participant recruitment and follow up surveys of participants in Washington, privacy is almost always noted as a top concern. Robust measures are required to ensure that data protection

requirements are adhered to and that data security is maintained and these matters need to be addressed holistically in an interoperable ecosystem. These measures are essential but, irrespective of how robust they are, there is still a risk that the public will be concerned about unauthorized sharing and use of their personal data.

5 OPTIONS

Compatibility can take many forms. The degree of realization of benefits as described in Section 3 and the ability to overcome challenges as described in Section 4 depends on the form of compatibility Washington policymakers choose to create. We present four models in this Section, ranging from minimal compatibility to full service integration.

5.1 Do nothing

The default approach to RUC and tolling is to maintain them as separate functions, with separate purposes and distinct operations. *Good To Go!* users will be required to set up and manage a second account used solely for RUC. This would be the easiest option for WSDOT. It simplifies the process of “standing up” the RUC operation, a process that, it could be argued, is already challenging enough without complicating it further by trying to make it interoperable. It has been observed that it is in the early days of a tolling or road user charging operation that the greatest challenges arise, the most contact, and complaints and disputes by customers are made. It has also been seen that this “teething” stage is not just a case of having a rough ride for a few months before getting to grips with the operation. There can be long-lasting damage to user perception, rates of compliance or payment and operational costs if the operation is not run well from the start. Such an outcome is not pre-ordained, however, but it will require more rigorous planning to start up an interoperable operation than a non-interoperable one.

Against this, the benefits of lower overall operational costs and higher overall revenue that may arise with interoperability will not be realized in the do-nothing scenario. Also, providing interoperability as an option to users helps ensure it is not an additional burden or inconvenience on users.

The question of whether or not to be interoperable with tolling could also be seen as a question of timing. There is an option to become interoperable at a later stage when the RUC operation has become more stable and is better positioned to deal with potential turbulence in transitioning to tolling interoperability. At such a future point, there may in fact be a demand from the public for tolling interoperability,

which could be seen as a better starting point than having to persuade the public of its benefits.

We suggest that if interoperability with tolling is to be pursued, it should be done from the start. This will add some complexity to the planning for RUC but will allow the benefits of interoperability to be realized from day one and will be less disruptive than migrating to interoperability at a later stage.

5.2 Collaboration

We can envisage a level of compatibility that could be achieved by means of a basic process of collaboration. This could take the form of regular meetings between RUC and *Good To Go!* representatives, sharing of information and pursuit of certain common objectives. At a very basic level, both systems should work off the same DOL vehicle registry, for example. We could envisage efforts to establish a common look and feel to websites and other contact channels, consistent operational procedures and links between websites. Indeed, even creating the sense among customers, if they contact the wrong contact center, that their issue is being addressed in a consistent way is a small but important measure. These might seem like trivial matters but they can make a big impact. And they can be achieved with minimal investment, but with a strong sense of common purpose and close co-operation and co-ordination. The spirit of collaboration is something that needs to be nurtured at every level within the respective organizations and needs to be something that staff feel is valued and rewarded.

5.3 One bill

Under this model, RUC and tolling transactions are calculated separately but combined into one bill or statement for the customer to pay. This would require the setting up of a separate system to which both providers feed in their charges and which would generate a single invoice for the user.

From a customer perspective, this would allow for all charges to be displayed in a single source and increase the transparency of where and when the charges were incurred, allowing for a total payments view. In this model, the customer would still hold two separate accounts, with two separate account providers and would pay

them both separately for the charges incurred. Nonetheless, there is some convenience from a user perspective.

There is some benefit for *Good To Go!* in that it shares some of the costs of invoicing with RUC. It is possible, however, that this model could result in increased operational costs due to users making payments to RUC that should have gone to *Good To Go!* and vice versa and of contacting the wrong operator in the event of an issue. Under more integrated models, where users simply make a single payment which is allocated between the relevant entities in the background, this is less likely to happen.

The systems for both *Good To Go!* and RUC will require an interface with a single invoice-generating back office to allow for the billable transactions to be consolidated for the user. This back office will need to be designed to accept transaction files from *Good To Go!* and RUC and some changes to the design of the *Good To Go!* and RUC systems may be required in order to allow such transaction files to be processed.

One of the challenges with compatibility is securing agreements between the various entities between whom there are interdependencies. This challenge is less pronounced under the “one bill” model than with other models of compatibility. One of the issues to be addressed relates to the sharing of information on customers and transactions. This will include obligations to notify the operating agencies of changes in customer details¹. It will also require agreement in relation to information security and data protection standards with which to comply. Agreement will be required to ensure collaboration in the event of miss-allocation of payments and other errors. Finally, a level of performance will be demanded from the entity responsible for generating invoices.

From a customer perspective, a single bill does not remove the administrative burden of having two accounts for what they may perceive to be the same function – paying for use of roads. It will, however, remove any ambiguity relating to what the customer is paying and who they are paying it to. All risk of non-payment will

¹ Both *Good To Go!* and RUC should receive the same information on ownership details from the DOL.

remain with the individual operators as they are each responsible for the customer.

5.4 One account

Under this model, the user has a single account provider but continues to make separate tolling and road usage payments and WA RUC and *Good To Go!* remain individually responsible for retrieving payments and engaging with users. If there is a single device used to capture both toll events and road usage, such a device could be provided by the account provider under this model.

This model is an advancement on the One Bill model insofar as it helps to address the issues relating to inconsistency of customer and ownership information. The account provider could be a *Good To Go!* account provider or a RUC account provider. 3rd party fleet management companies are already behaving like account providers, having established a single account with *Good To Go!* and individual accounts with their subscribers and levying management charges on their customers for this service. Based upon the information gathered for this paper, there seems to be no reason why this model couldn't be expanded to include RUC.

The one account model would simplify the process of registration for users who would only have to register once for both RUC and tolling services. Users who are already registered with *Good To Go!* would have to sign up for having their RUC charges being reflected on their *Good To Go!* account and invoices. Customers contacting their account providers may need to be redirected to either WA RUC or *Good To Go!* in the event that an issue is not within the responsibility or power of the account provider to resolve. This could lead to some frustration on the part of the user who may want to interact with a single account provider for all matters relating to road usage – essentially the One Service model described below. Again, adopting some of the simple measures described under the 'Collaboration' option above will help to address some of these customer service issues.

5.5 One service

In the One Service model, customers would see all road charges, tolling and RUC, as being delivered by a single service. It would provide both for One Bill and One

Account but could additionally provide for a single payment portal through which payments are made. Such payments could either be made separately for RUC and tolling or could be bundled into a single payment that is allocated by the account provider towards WA RUC or *Good To Go!*. The user would engage with a single account provider who would provide a 'one stop shop' for all road usage related matters. This would be of significant benefit to users.

The account provider could either be the *Good To Go!* account provider or a RUC account provider. Indeed, the question arises as to whether the fleet account model that prevails on *Good To Go!* at present could be extended to provide something akin to the 'one service' model.

Tracking of road usage could either be provided in-house (by a state agency) or outsourced to a contractor or service provider, for example to the provider of the OBD-II device. Outsourcing of this function would allow the account provider to focus on a core competence in customer service and account management but may involve some additional contractual complexity.

This model is technically more complex than the One Account model and requires the processing of road usage and toll transaction data, the translation of this into amounts due, the processing of payments and customer contact. The system will need to provide full traceability to ensure that transactions, usage and payments are correctly allocated. In any case, this model may require some adaptation of the *Good To Go!* system, will add some complexity to the RUC system and is generally more technically challenging than the other models. Nonetheless, it is not a new concept and there are many systems worldwide that provide this kind of integrated service today.

Where an account provider is contracted to WA RUC and *Good To Go!*, it is essential that the full scope of services is reflected and that there are appropriate levels of service included, penalties in the event of failure to provide a service and appropriate incentives and remuneration considering the service being provided. This approach does lend itself to being a true service model whereby the account provider can be contracted to provide a full end to end service and whereby WA RUC and *Good To Go!* can demand levels of service that are more aligned with

the outcomes they seek rather than specifying more detailed technical requirements that may not ultimately lead to the level of service required.

6 ASSESSMENT

Table 1 below presents a simple assessment of the various degrees of compatibility. The evaluation criteria reflect the benefits listed under Section 3.2 and the challenges listed under Section 4 in relation to each of the compatibility models. The scores presented do not reflect the level of complexity and the true impact of the issues under consideration. Equally, the criteria themselves have not been weighted in order to reflect legislative, WSTC, or Steering Committee priorities. This evaluation is designed to stimulate thought and reaction. We have also shown in Section 5 above how the models are not strictly defined and some of them could be combined.

	Model A	Model B	Model C	Model D	Model E
User Experience					
Improved Collections					
Operational Efficiency					
Contractual Complexity					
Operational Complexity					
Governance					
Technical Complexity					
User Perception					
Cost of Implementation					

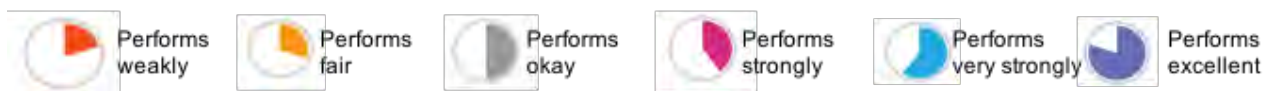


Table 1: Evaluation of Compatibility Approaches

7 POLICY PRINCIPLES

We have outlined benefits, challenges, and several prospective approaches to achieving or pursuing compatibility between RUC and tolling in Washington.

Washington can achieve compatibility between RUC and tolling at various levels of integration, depending on the appetite for such integration and the willingness to invest in it from the start. Even with minimal compatibility, Washington can achieve one fundamental objective: improve the user experience, by reducing confusion, reducing steps, increasing understanding of user requirements to comply, and clearly communicating the purposes of RUC and tolling.

To support further developing an approach to compatibility of RUC and tolling, we set out some high-level policy principles to consider below, should the legislature pursue RUC as a revenue mechanism.

- ▶ At least minimal compatibility between RUC and tolling should be pursued from the start of RUC rather than introducing it at a later stage.
 - > Detailed planning should be undertaken to ensure that any additional complexity arising from the introduction of an interoperable service, does not jeopardize the launch of RUC.
 - > A minimum condition for pursuing compatibility is that the type and degree of compatibility must deliver customer ease of use far superior to that of two distinct, non-compatible systems.
 - > RUC and tolling should co-ordinate their activities so that users are given a sense of a consistent service even if the two operations remain separate.
- ▶ There will be challenges, costs, and benefits to RUC and/or tolling in achieving a given compatibility model. The broader benefits to transportation in Washington may be far greater and may justify the investment needed to bring about compatibility. With this in mind, the following factors should be considered.
 - > Maintaining a collaborative relationship between RUC and tolling.
 - > Ensure there is full transparency in terms of costs and benefits.
 - > Ensuring that there is appropriate allocation of responsibility and compensation for RUC and tolling agencies.

- ▶ The legislature should define a governance framework for compatibility between RUC and tolling.
- ▶ Compatibility between WA RUC and *Good To Go!* can grow over time to include possible use of an interoperability hub and broader collaboration with RUC systems in neighboring states and other transport services. Technology should be designed in such a way that interoperability with other transport systems is feasible, i.e., it should be based on an 'open architecture' concept and be 'future-proofed'.





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WASHINGTON STATE RUC FEASIBILITY
ASSESSMENT, WORK PLAN, & BUDGET

Washington State Transportation Commission // January 23, 2013

 **WA RUC**



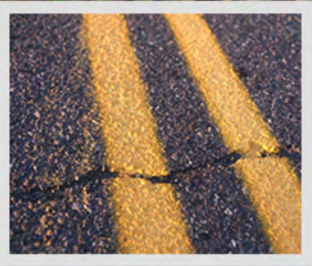
Washington State Road Usage Charge Assessment

*Feasibility Assessment,
Work Plan, and Budget*

*Report to the Legislature
by*

*Washington State
Transportation Commission*

January 23, 2013



Washington State Transportation
Commission



Washington State
Department of Transportation

CAMBRIDGE
SYSTEMATICS

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STATE OF WASHINGTON
TRANSPORTATION COMMISSION

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January 23, 2013

The Honorable Governor Jay Inslee
Office of the Governor
PO Box 40002
Olympia, WA 98504-0002

The Honorable Curtis King
Co-Chair, Senate Transportation Committee
PO Box 40482
Olympia, WA 98504-0482

The Honorable Tracey Eide
Co-Chair, Senate Transportation Committee
PO Box 40482
Olympia, WA 98504-0482

The Honorable Judy Clibborn
Chair, House Transportation Committee
PO Box 40600
Olympia, WA 98504-0600

Dear Governor Inslee, Senators King and Eide, and Representative Clibborn:

As cars become more fuel-efficient and alternative fuel vehicles such as biodiesel, electricity and natural gas become more common, the long-term sustainability of the gas tax as a primary revenue source for transportation will steadily decline. Responding to this concern, in 2012 the Legislature and Governor directed the Transportation Commission to convene a stakeholder Steering Committee and assess the feasibility of a Road Usage Charge as a potential replacement for the state's gas tax. The initial work is now complete and the Transportation Commission concurs in the Steering Committee's finding that a Road Usage Charge is a feasible option for funding Washington's transportation system. Whether or not it makes sense and is desirable for Washington State will require additional work.

A Road Usage Charge is a direct user fee, collected from drivers based upon the actual miles driven or through a permit valid for a specified period. This is in contrast to the gas tax, which is an indirect fee based upon how much fuel is burned. While the shift away from petroleum-dependent transportation is critical for energy security, the environment and our economy, it will adversely affect transportation in Washington State if our 1920's-era funding system does not evolve as well.

The Honorable Governor Jay Inslee
The Honorable Curtis King
The Honorable Tracey Eide
The Honorable Judy Clibborn
January 23, 2013
Page 2

Another side effect of remaining dependent upon the gas tax is that over time, inequities in tax payments among drivers may be exacerbated. Under the current system, a person who must drive a lower-MPG vehicle (such as an older pickup truck, minivan or all-weather vehicle) will pay much more in taxes than someone who can afford to purchase the newest high-MPG vehicles. This discrepancy will become even sharper once the new federal fuel economy standards (CAFE) of 54.5 mpg take effect in 2025.

Washington is not alone in considering whether and how to develop a Road Usage Charge. Oregon, the first state to enact a gas tax, is now concluding its second pilot test of road usage charge concepts. In December, the Government Accountability Office (GAO) issued a report that found that a mileage-based user fee is a desirable alternative funding mechanism for transportation.

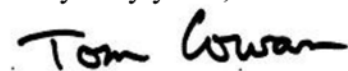
The Commission is recommending a work plan that includes in-depth research and investigation of several critical issues that were identified by the Steering Committee in order for a Road Usage Charge to become a realistic transportation funding alternative for Washington State. These issues include:

- Whether a Road Usage Charge should replace, supplement or transition away from the gas tax;
- Whether revenue from a Road Usage Charge should be spent solely on highway purposes or more broadly on transportation needs;
- How to account for miles driven outside of Washington and how to charge drivers from out-of-state who are using Washington roads.

To support this work plan, we are requesting \$1.6 million in the 2013-15 biennium to carry out the tasks of the first phase of work described in Sections 3 and 4 of the attached report. Please note the proposed work plan has two phases to allow for greater public outreach and input; to scale down the funding requirements; and to ensure that the Legislature and Governor retain full control over the pacing and scope of the work, including whether to proceed to the next phase of development. We are pleased that the Steering Committee has unanimously agreed to continue working on this important issue if the Legislature approves.

We look forward to continuing this work and look forward to your guidance and support in the coming session and beyond.

Very truly yours,



Tom Cowan
Chairman, Road Usage Charge Steering Committee
Vice-Chairman, Washington State Transportation Commission

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Steering Committee Membersii

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Additional Documents

The following foundational material was used by the Steering Committee to reach the conclusions in this report:

- *Report 1: Domestic and International Review and Policy Context*, Steering Committee #1 Briefing Material, September 13, 2012;
- *Report 2: Potential Road Usage Charge Concepts for Washington*, Steering Committee #2 Briefing Material, October 23, 2012;
and
- Presentations at four Steering Committee meetings.

These are available on the Steering Committee’s web site: <http://waroadusagecharge.wordpress.com/>, as well as on the CD that accompanies the printed version of this report.



Steering Committee Members

Name and Affiliation	Representing	Name and Affiliation	Representing
Steering Committee Chair, Commissioner Tom Cowan (WSTC Commissioner)	WSTC	Pete Capell (Clark County Public Works)	Cities and Counties
Commissioner Anne Haley (WSTC Commissioner)	WSTC	Cynthia Chen (University of Washington)	Appointed by WSTC
Commissioner Charles Royer (WSTC Commissioner)	WSTC	Scott Creek (Crown Moving Company, Inc.)	Trucking industry
Sen. Tracey Eide (Federal Way (D) 30 th District)	Washington Senate	Don Gerend (City of Sammamish Councilmember)	Cities and counties
Sen. Ann Rivers (La Center (R) 18 th District)	Washington Senate	Paula Hammond (WSDOT Secretary)	Appointed by WSTC
Rep. Andy Billig (Spokane (D) 3 rd District)	Washington House of Representatives	Tom Hingson (Everett Transit)	Public transportation
Rep. Mark Hargrove (Covington (R) 47 th District)	Washington House of Representatives	Sharon Nelson	Appointed by WSTC
Curt Augustine (Alliance of Automobile Manufacturers)	Auto and light truck manufacturers	Kush Parikh (INRIX)	User fee technology
Kurt Beckett (Port of Seattle)	Appointed by WSTC	Janet Ray (AAA Washington)	Motoring public
Rod Brown Jr. (Cascadia Law Group PLLC)	Environmental	Neil Strege (Washington Roundtable)	Business

Committee member biographies are shown in Appendix A.

Section 1:

Introduction and Executive Summary

Legislative Directive for this Feasibility Assessment

The 2012 Regular Session of the 62nd Legislature passed a Supplemental Transportation Budget, providing funding to the Washington State Transportation Commission (WSTC) “solely to determine the feasibility of transitioning from the gas tax to a road user assessment system of paying for transportation.”¹ The Legislature also provided funding to the Washington State Department of Transportation (WSDOT) “solely to carry out work related to assessing the operational feasibility of a road user assessment, including technology, agency administration, multistate and Federal standards, and other necessary elements.”

Both efforts were conducted under the guidance of a Steering Committee. Required activities included:

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

Objective of this Feasibility Assessment

The purpose of this assessment was to determine whether road usage charging is feasible for Washington, and if so, make recommendations about what next steps should be taken or further studied.

¹ Engrossed Substitute House Bill 2190, 62nd Legislature, 2012 Regular Session.

Motivations for Examining a Road Usage Charge

This feasibility assessment builds on previous work to identify a sustainable, long-term funding source for transportation in Washington, including:

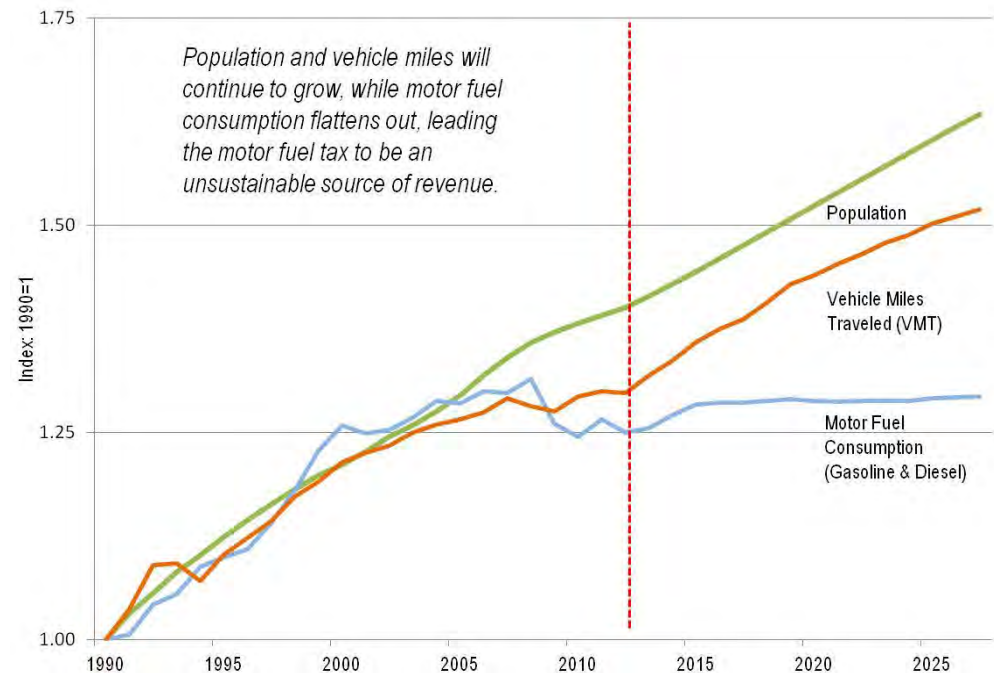
- 2007 – Long-Term Transportation Financing Study;
- 2009 – Implementing Alternative Transportation Funding Methods; and
- 2012 – Connecting Washington.

The motor fuel tax represents the largest share of State transportation funding, supporting 76 percent of all transportation investments.² Because the motor fuel tax is levied as a fixed amount per gallon, it:

- Does not rise and fall with the price of fuel;
- Does not keep pace with inflation; and
- Declines on a per-mile basis as vehicles become more fuel-efficient.

While some of the reduction in motor fuel consumption after 2008 is attributable to economic conditions, better fuel economy in light-duty vehicles will be the primary cause of lower fuel consumption over the next 15 years.³ Population and vehicle miles will continue to increase but will consume less fuel – this translates into less revenue for road improvements. The motor fuel tax is not sustainable over the long term, which prompted the Legislature to request this assessment of the feasibility of transitioning to road usage charging.

Population, Vehicle Miles Traveled, and Motor Fuel Consumption Trends and Forecast (1990-2027)



Sources: Population and fuel consumption forecasts based on Washington Office of Financial Management (OFM), November 2012 projections. VMT based on OFM, September 2012 projections.

² Connecting Washington, January 2012.

³ Chart does not reflect recently enacted Federal corporate average fuel-efficiency standards of 55 MPG by 2025 for light duty vehicles, so future per-capita fuel consumption should be even lower than shown.

Feasibility Assessment Process

The Steering Committee conducted its feasibility assessment in steps, establishing a common understanding of road usage charge policy and technical considerations (see timeline below). At its first meeting, the Steering Committee received a report on domestic and international experience with road usage charging and an overview of policy issues. Through facilitated discussion Steering Committee members expressed their preferences on policy objectives and feasibility criteria, which were confirmed through a follow-up member survey.

At its second meeting, the Steering Committee received a report on potential road usage charge concepts for Washington that would carry out the policy objectives identified in the first meeting, and be evaluated according to the feasibility criteria. Committee members unanimously agreed that road usage charging is feasible in Washington. The first two reports are available on the road usage charge web site.



Steering Committee Feasibility Recommendation

The Steering Committee unanimously concluded that a road usage charge is feasible in Washington and recommends further evaluation as outlined in the Work Plan and Budget Sections of this report (Sections 3 and 4).

The Steering Committee recognizes that the gas tax is not a sustainable revenue source for transportation in Washington, as demonstrated by prior studies. Successful international examples of road usage charge systems in practice and successful demonstrations in the U.S. show that there are numerous viable operational concepts and technologies for road usage charging in Washington. The Steering Committee has not agreed on whether it would be preferable to use road usage charging to supplement or replace the gas tax.

However implemented, road usage charging will not be perfect, but no tax mechanism is perfect, including the current gas tax. All taxing policies involve tradeoffs between ideal policy objectives and how these objectives can actually be implemented. This assessment demonstrates that offering choices may solve many of the issues related to road usage charging (e.g., privacy and acceptance).

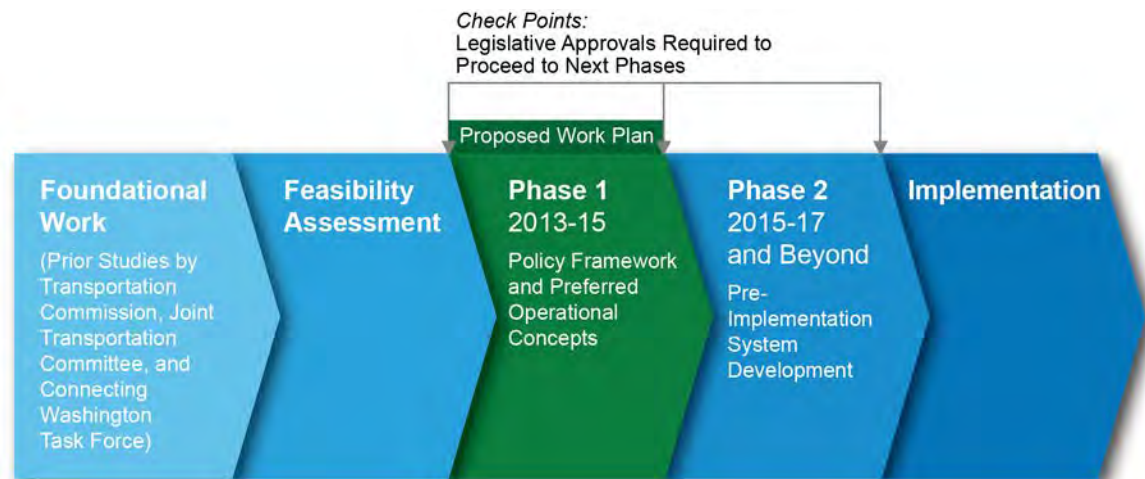
Proposed Work Plan Moving Forward

To get from where we are now—“feasible”—to a new system of road usage charging is a complex effort involving potentially contentious policy choices and operational and administrative design decisions. We developed a two-phase process to get to the point where Washington might implement a new road usage charge system.

2013-2015 Biennium: Policy Framework and Preferred Operational Concepts (Phase 1). If authorized by the Legislature, the next phase of work would focus on policy choices, implications, public outreach, and operational concept design to enable the Legislature to decide whether to begin full pre-implementation system development.

2015 and Beyond: Pre-Implementation System Development (Phase 2). If authorized by the Legislature, activity would shift to detailing system features and administrative needs and conducting pilot tests of preferred operational concepts. Phase 2 would be scoped at the end of Phase 1.

Implementation. At the end of Phase 2, if directed by the Legislature, full implementation and transition activities could commence.



Potential Role of Pilot Tests in the Work Plan. Pilot tests can demonstrate technology, administrative systems, or public acceptance before committing extensive resources to a road usage charge system. Pilot tests will be best carried out in Phase 2 once policy direction is established and a preferred operational concept is chosen. See page 50 for more details.

Section 2:

Feasibility Assessment

Background: Reasons and Ways to Charge for Road Use

Practitioners often use terms such as tolling, congestion pricing, and road usage charging interchangeably, but there are substantive differences among them. The list below provides brief descriptions of four forms of charging in order to clarify the differences.

- Fuel tax. Charges assessed on fuel consumed by road users.
- Toll. Charges assessed on users of a specific highway, bridge, or tunnel (such as on Tacoma Narrows Bridge and SR 520 in Washington), including express toll lanes (such as SR 167).
- Congestion charging. Charges assessed during specific times and at specific places to change travel behavior and manage congestion.
- General road usage charging. Charges assessed across the entire network of roads based on measured usage.

The sole focus of this assessment is on “general road usage charging,” which we define as an alternative means of paying for the road system in general, and has these characteristics:

- Network-wide. Charged across an entire network of facilities for a specified geography rather than for a single facility, corridor, or “trunk line” as is often the case in tolling.
- Charged 24/7. Charged regardless of the time of use. In this respect, road usage charges are like other utilities or consumer products. Time-of-day charging can manage demand, but is not a necessary component.
- For General Roadway Usage. Would fund transportation expenditures across a broad region or state, rather than a single facility or limited jurisdiction.

Background:

Typical Policy Objectives of General Road Usage Charging

There are many reasons to assess charges on road usage. The primary purpose is typically revenue generation, but there are often secondary motivations.

Typical Primary Objective: Revenue Generation

The primary purpose of general road usage charging, as we define it, is to raise revenue. The use of that revenue may vary. In practice, examples of the allocation of these revenues include:

- Revenues dedicated to highways. New Zealand's road usage charge is dedicated to the highway system, transport studies, and environmental projects.
- Revenues dedicated to transportation. Examples include U.S. Federal fuel taxes that are devoted to the Highway and Transit Trust Funds. Most state gas taxes are similarly devoted to transportation uses, if not dedicated explicitly to highways.
- Revenues partially dedicated to highways or transportation. Outside the U.S., particularly in Europe, revenues deriving from road usage, such as fuel taxes and tolls, are often diverted to non-transportation uses. In the UK, less than half of road revenues were devoted to transport and only 20 percent out of £50 billion to highways in 2010.
- Revenues devoted to a general fund. In many places around the world (but not in the U.S.), road usage-derived charges, including fuel taxes, are deposited into a general fund together with other tax revenues. Because funds are fungible, there is no meaningful link between revenues and spending.

Background: **Typical Policy Objectives of General Road Usage Charging (continued)**

Typical Secondary Objective: Other Social Purposes

Secondary purpose(s) of general road usage charging may be to address various social objectives, such as:

- Manage demand/congestion. Prices can influence the demand for transportation. Therefore, it is possible to use price to manage demand in addition to raising revenue.
- Protect the environment by reducing fuel use. Fuel taxes directly discourage fuel consumption. France's "eco-tax" on heavy vehicles and Switzerland's heavy vehicle tax have explicit tax components based on environmental impact. Austria utilizes road usage charging to help shift freight from roads to rails. In all of these cases, however, revenue is still a primary objective.
- Influence travel behavior and other decisions such as land use. All charges or taxes affect user behavior. Some are explicitly designed to influence choices, such as the very high fuel taxes found in Europe, congestion charges, and environmental taxes. Charges that seek only to recover costs of road use, such as New Zealand's road usage charge and U.S. fuel taxes, have less impact on personal decisions.

Actual Experience With Road Usage Charges is Limited

Though studied extensively both by academics and by practitioners, implementation of road usage charging has been limited:

- New Zealand. All heavy and alternative fuel vehicles have been subject to road usage charges since 1978 using a low-tech system where motorists buy blocks of kilometers. Newer systems that use advanced technologies to measure and pay charges are being phased in.
- European Vignette Systems. Several European nations use vignettes (stickers) that allow motorists to use certain roads for a designated time (from a few days to a year).
- U.S. – Weight-Distance Taxes. Over 20 states implemented weight-distance charging for commercial vehicles in the mid-20th century, but only four programs remain (Kentucky, New Mexico, New York, and Oregon), the rest having been replaced by diesel taxes. The reasons for switching from weight-distance charges to diesel taxes included high cost of collection for government agencies, high cost of compliance for operators, and evasion. These shortcomings were due to manual reporting before computer automation and modern communications became available for tax reporting and collection.
- U.S. – IFTA and IRP. Interstate truck operators report miles state-by-state in order to convert diesel taxes and registration fees into mileage-based fees through the International Fuel Tax Agreement (IFTA) and International Registration Plan (IRP), respectively.

Sections 4-7 of Report 1 provide more details on many of the systems mentioned here and on the next page.

Studies and Proposals of Road Usage Charge Systems Are Numerous

International

Four countries outside the U.S. have studied and conducted pilot tests of road usage charging: United Kingdom, 1964 – Present; Singapore, 1978 – Present; The Netherlands, 1988-2010; and Hong Kong, 1983-2009. While there are many differences, they share the following characteristics:

- Studies have been underway for several decades or more and have rarely led to the implementation of new operational systems;
- Road usage charging was coupled with one or several companion policies such as congestion charging, tolling, and environmental impact charging; and
- Policy-makers often undergo several “rounds” of study, outreach, and analysis before a system is implemented.

Domestic

General road usage charging has been discussed, proposed, studied, and subject to pilot tests in almost 20 states, including:

- Studies with completed trials – University of Iowa (not fully reported); Oregon DOT (2007), Puget Sound Regional Council (2008);
- Studies with trials in progress – Minnesota DOT (2011), Oregon DOT (2012); and
- Studies without trial (so far) – I-95 Corridor Coalition, Nevada DOT, Colorado DOT, San Francisco Bay Area.

Motivations for these efforts were similar to those in Washington: falling gas tax revenues caused by increasing vehicle fuel efficiency and the emergence of vehicles that do not use motor fuel. While these studies generally focus on generating revenues to cover road usage costs as their primary policy goal, several of these studies also considered other goals such as reducing peak-hour urban congestion and reducing emissions.

Lessons Learned from Prior Road Usage Charging Efforts

Prior efforts provide valuable lessons for Washington's feasibility assessment, including:

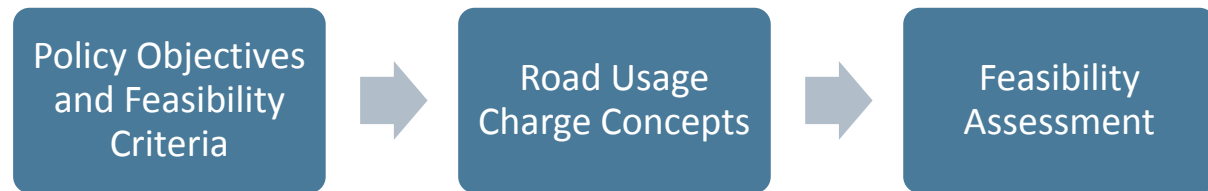
- Policy framework:
 - > Establish policy and legislative framework first – then select a solution to fit policy objectives.
 - > Policy objectives drive the technology selection, not the other way around.
 - > Understand, refine, and test policy objectives – be open and communicate clearly with the public and stakeholders.
 - > Passenger cars are different than trucks.
- User experience:
 - > Choices in technology and payment streams are key.
 - > Ensure simplicity and efficiency.
- Public acceptance:
 - > Minimize exemptions and consider phase-in discounts.
 - > Clearly define what will be done with the revenues.
- Implementation:
 - > “Open market” approach and use of certified service providers reduces overall costs and ensures system sustainability.
 - > Enforcement and legal appeals process are critical – taxes have more “bite” than fees, tolls, or charges.
 - > Political will is essential.

Steering Committee Policy Objectives⁴

Working with the consultants, Steering Committee members expressed their policy objectives for road usage charging in Washington, recognizing that there may be some tradeoffs in how well different objectives are met:

- Create a sustainable transportation revenue source to address erosion in revenue due to vehicle fuel efficiency gains;
- Demonstrate equity in who uses and who pays for transportation;
- Increase the transparency of what road use costs and how funds are spent; and
- Accomplish other social objectives, such as:
 - > Reduce the amount of driving;
 - > Reduce energy usage;
 - > Reduce greenhouse gas emissions; and
 - > Reduce congestion through pricing.

There was a range of opinion as to which objectives should be considered in the feasibility assessment. For the most part, creating a sustainable transportation revenue source was the highest priority for most of the Steering Committee members. The policy objectives formed the basis for a set of illustrative road usage charge concepts developed by the consultant team for use in the feasibility assessment, but considerably more work on refining policy objectives would be needed in Phase 1 of the proposed work plan (see Section 3).



⁴ Please reference Report 2, *Potential Road Usage Charge Concepts for Washington*, for more detail about the policy objectives and feasibility criteria.

Feasibility Criteria

The Steering Committee developed 10 feasibility criteria to evaluate the illustrative operational concepts developed by the consultant team:

- **Convenience:** The system is convenient to the users; it does not impose a significant burden for compliance and offers choices to meet the needs of diverse users.
- **Implementability:** The system can overcome implementation barriers and challenges – reasonable solutions exist.
- **Transparency:** The system can achieve transparency in the rate-setting, customer billing, and accounting.
- **Stability and Sustainability:** There is a high degree of confidence in revenue expected from the system, measured by revenue stability and sustainability relative to the gas tax.
- **Privacy:** Actual and perceived issues of privacy are considered.
- **Fairness (Equity):** The system can collect revenues from users in a way that is fair across classes of users such as cars and trucks; urban and rural residents; and motorists of all income levels.
- **Flexibility:** The system can accommodate evolving revenue collection technologies, revenue needs, user needs, and policy changes such as rate-setting.
- **Choice:** Users can choose from a menu of options to meet their individual preferences.
- **Out-of-State Travel:** The system can distinguish between in-state and out-of-state travel.
- **Collect Revenue from Out-of-State Travelers:** The system has an appropriate way to collect revenue from out-of-state travelers.

While there was a general consensus that all of the feasibility criteria were appropriate, the Steering Committee found the criteria related to out-of-state travel to be of lesser importance in making a feasibility determination.

Core Elements of Potential Operational Concepts

Road usage charge concepts are composed of the following core elements:

- **Principal.** The responsible party – individual or entity such as a corporation or other organization – that is legally responsible to pay charges and fines. This party should be defined in law.
- **Vehicle.** Vehicles for which a road usage charge is levied should be identified in legislation, as should vehicles that might be exempted.
- **Road Network.** The road network defines the roads that are subject to the road usage charge. It is possible that some roads might be excluded from charges, such as roads on private land and toll facilities.
- **Usage.** A measure of usage of the road system that can be based on distance or time (or both).
- **Charge Rates.** How much is charged per unit of usage.
- **Charging Policy.** The set of laws, regulations, and rules that defines the road network, usage, rates, and approved methods of measurement.
- **Road Usage Charge Administration.** Includes account management, charge management, compliance and enforcement, and policy/administrative functions. A combination of governmental and private entities can carry out these functions.

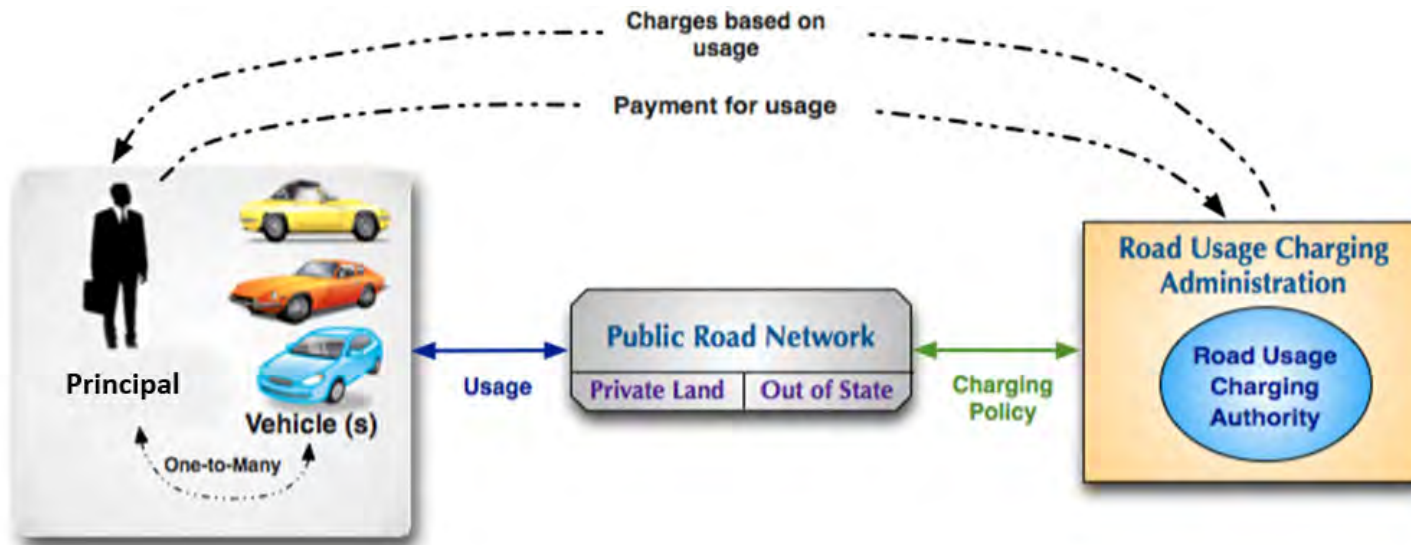
Core Elements of Potential Operational Concepts (continued)

The core elements combine to form operational concepts that include these characteristics:

- Every vehicle will have a single principal, but a principal may be responsible for more than one vehicle.
- Usage of the vehicle on the road network will generate charges based on the charging policy.
- A road usage charging administration will manage accounts, charge the principal, and collect and manage payments.
- The road usage charging administration might be part of an existing organization or organizations, a new entity, or some combination of these. It may also encompass both governmental and private sector elements.

Figure 2-1 provides an overview of how the core elements fit together into the **generic operational concept**.

Figure 2-1: Generic Road Usage Charge Operational Concept



Core Elements of Potential Operational Concepts (continued)

A Simple Charging Policy

At its simplest, the road usage charge consists of a rate that applies to road usage on all roads at all times (Figure 2-2):

- Rate: Could be the same for all vehicles or differ based on:
 - > Number of axles;
 - > Physical size of vehicle (length, width, and height);
 - > Type of vehicle drive train (e.g., internal combustion engine, gas hybrid, diesel hybrid, electric.);
 - > Vehicle class; or
 - > Combination of any of the above.
- Usage: The amount of usage based on some combination of these factors:
 - > Time:
 - Calendar (e.g., week, month, year); or
 - Engine run time.
 - > Distance:
 - Odometer reading;
 - Computations from an inertial navigation system (INS); or
 - Computations from a global positioning system (GPS).

Figure 2-2: A Simple Road Usage Charge



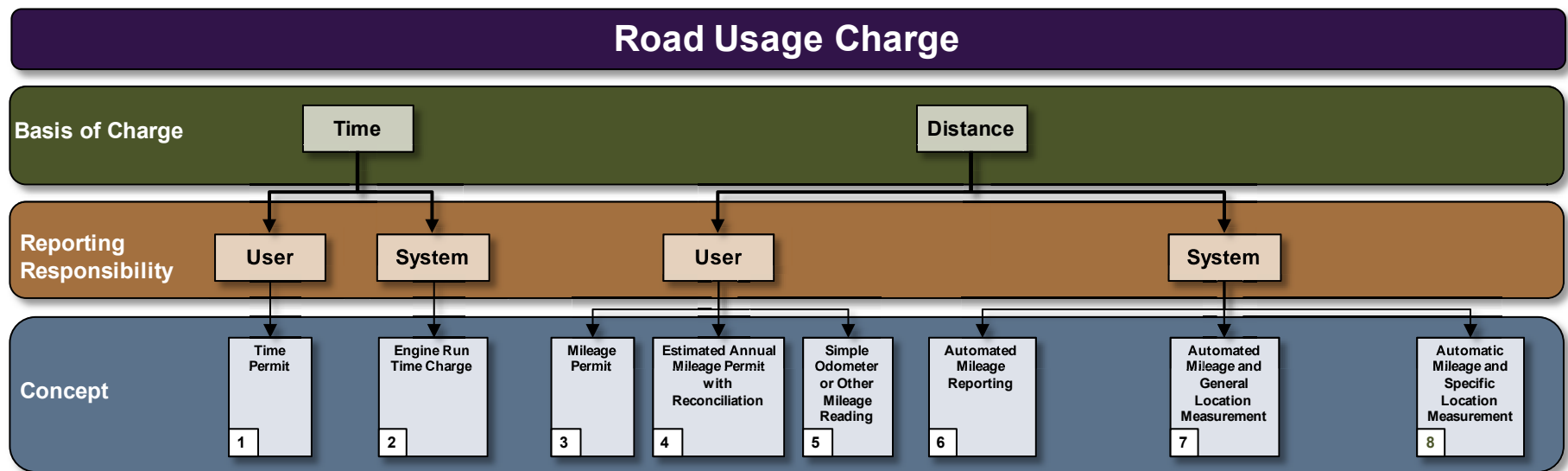
In addition to simple road usage, charging policies can assess charges for congestion and environmental impacts of driving, either separately or in combination.

Framework for Operational Concepts

Figure 2-3 outlines a framework for eight operational concepts, each reflecting how Washington State might implement a road usage charge, consisting of the following dimensions:

- Basis of the charge – Either time or distance (potentially including congestion or environmental factors).
- Reporting responsibility – Either declared by the user or detected by the road usage charge “system,” including any component technologies.

Figure 2-3: Road Usage Charge: Framework for Operational Concepts



These eight operational concepts capture a broad range of policies – from “simple” usage charging to “more complex” congestion and environmental charging, and technologies – from no technology to non-location-based technology to location-based technology. It is possible – and probably preferable – to implement several operational concepts in parallel rather than relying on one single concept in order to achieve a range of choices for principals.

We elaborate on the technology alternatives associated with the eight operational concepts on the next page.

Enabling Technologies

We further considered technology options to implement each of the eight concepts, as illustrated in the bottom row of Figure 2-4 (next page). There is no technology required for the concepts in which the principal reports usage, while there are several technology alternatives for concepts in which the system detects usage. Please reference Report 1, *Domestic and International Review and Policy Context*, for a more detailed treatment of the technology options and how each works.

Time-Based System Technology Options

The technology for reporting engine run time is relatively simple. Vehicles emit unique vibrations that only occur when the engine is running, and there are sensors that can detect these vibrations. It would be a simple matter to keep track of how long the engine is running, and then communicate the information to the road usage charge authority via in-vehicle telematics, Bluetooth device to a smartphone, or built-in single-purpose communications device. Even electric vehicles will have vibrations that can be detected.

Distance-Based System Technology Options

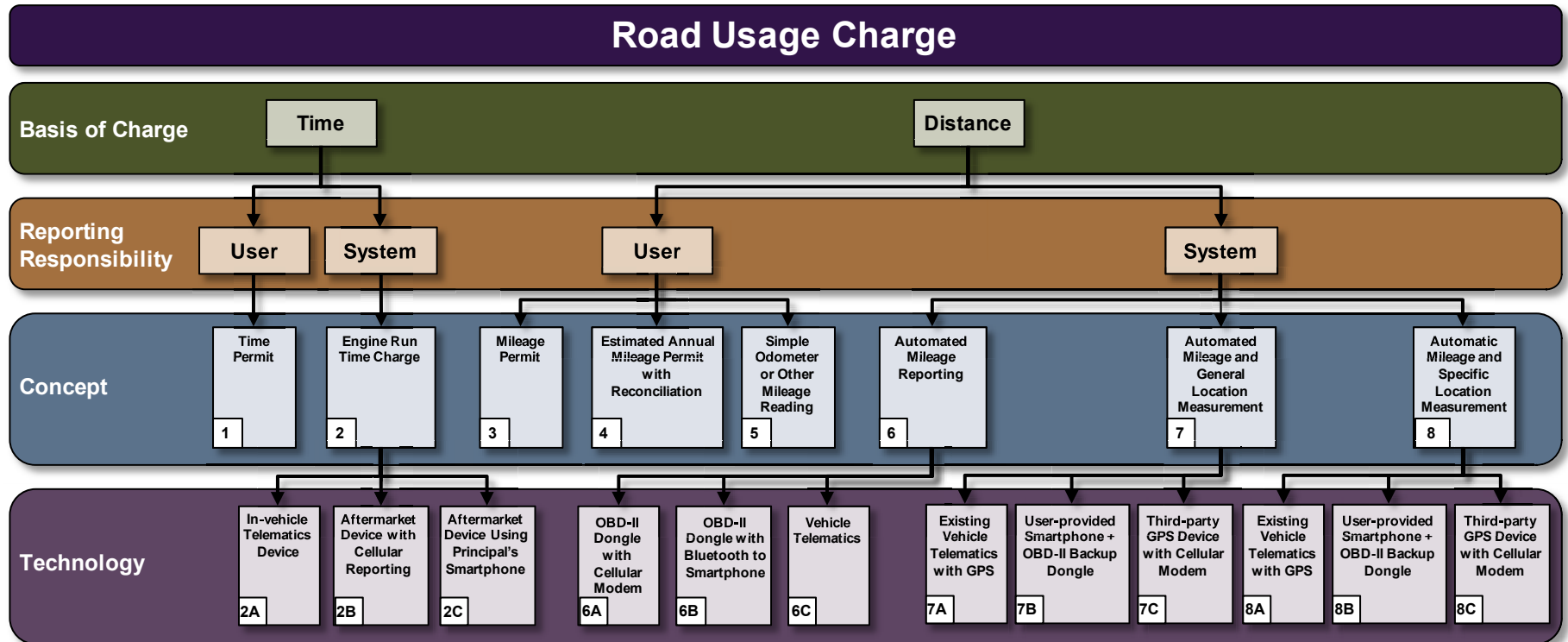
Automatic system reporting requires some technology (see Figure 2-4, next page).

- OBD-II⁵ devices such as the Progressive insurance “Snapshot” dongle are currently used for reporting miles for pay-as-you-drive (PAYD) insurance. The dongles have built-in cellular modems that transmit data over the Internet to a central server.
- Experiments in Ohio and Oregon are testing the OBD-II dongle with a Bluetooth interface to a cellular telephone that runs an application to collect and report data from the vehicle.
- Vehicle telematics such as GM’s “OnStar” or Ford’s “SYNC” can collect the data and transmit them over the cellular network to a cloud-based application for automated reporting.
- A number of stand-alone, third-party GPS units exist and are field-tested. Most of these are from truck mileage systems, but can be adapted to a car.



⁵ OBD-II devices connect to a vehicles on-board diagnostics port on vehicles manufactured after 1995 via a “dongle.”

Figure 2-4: Road Usage Charge Operational Concepts with Enabling Technology Options



Potential Operational Concepts – Overview

Descriptions of the road usage charging operational concepts, associated technology options and their relative advantages and disadvantages are provided on the next few pages. Please reference Report 2, *Potential Road Usage Charge Concepts for Washington*, for additional detail about each operational concept.

In considering the eight operational concepts, note that:

- Operational concepts are illustrative, designed to provide a better understanding of the range of alternatives and the high-level requirements to implement them.
- Some concepts do not require technology, while others need one or more technologies.
- Operational concepts are not mutually exclusive. In fact, if road usage charging advances in Washington State, it is likely that a combination of several concepts would be pursued, especially if some of the more technologically advanced concepts were included.
- Switching to a road usage charge all at once, in a “big bang,” increases the consequences of any failure in the system. A more gradual approach to introducing the road usage charge will have smaller downside risks.
- Policy choices, such as rate structure, determine whether some of these concepts can work.
- All of the eight operational concepts can be accommodated by a variety of administrative concepts.

Potential Operational Concepts – Specifics

The eight operational concepts, including technology alternatives associated with each, are briefly described below, grouped according to the basis of the charge: time or distance. A summary assessment of the potential operational concepts is included in Appendix B.

Time-Based Concepts

1. Time Permit. Purchase unlimited road network access for a set period of time (e.g., week, month, year).
2. Engine Run Time Charge. System detects engine run time over a set period (e.g., monthly) and reports charges automatically. There are three technology alternatives: a) In-vehicle telematics device, b) Aftermarket device with cellular reporting, c) Aftermarket device using principal's smartphone.

Distance-Based Concepts

3. Mileage Permit. Purchase a license to drive a certain number of miles.
4. Estimated Annual Mileage Permit with Reconciliation. Pay for estimated mileage for a set period, then reconcile the account based on actual distance driven periodically (monthly, quarterly).
5. Simple Odometer or Other Mileage Reading. Report mileage at the end of a period (e.g., quarterly) and pay the corresponding amount owed.
6. Automated Mileage Reporting. System detects mileage traveled and reports charges automatically at the end of a period (monthly, quarterly). There are three technology alternatives: a) OBD-II dongle with cellular modem, b) OBD-II dongle with Bluetooth to smartphone, c) Vehicle telematics.
7. Automated Mileage and General Location Measurement. System detects mileage traveled by geographic zone over a set period of time (e.g., monthly) and reports charges, with rates set by zone. There are three technology alternatives: a) Existing vehicle telematics with GPS, b) User-provided smartphone + OBD-II backup dongle, c) Third-party GPS device with cellular modem.
8. Automatic Mileage and Specific Location Measurement. System detects mileage traveled by geographic zone over a set period of time (e.g., monthly) and reports charges, with rates set by road segment or type of road. There are three technology alternatives: a) Existing vehicle telematics with GPS, b) User-provided smartphone + OBD-II backup dongle, c) Third-party GPS device with cellular modem.

Feasibility Assessment

The feasibility assessment considered each of the potential road usage charge concepts through the lens of the feasibility criteria. The consultant team conducted a preliminary feasibility assessment, rating each concept across the criteria using a five-point scale. In the end, all Steering Committee members agreed that road usage charging was feasible in Washington.

In conducting the preliminary assessment, a number of common themes and issues emerged across all concepts:

- Evasion likely to increase. Not all principals subject to the road usage charge will have a valid vehicle registration and might be able to avoid paying their road usage charges. With the gas tax, even unregistered motorists pay their road usage charge.
- Infrequent users are problematic. The high cost and complexity of implementing a road usage charge system that applies to infrequent users is problematic, especially given that one of the benefits of the road usage charge is making clear to users the relationship between usage costs and actual road usage.
- Administrative costs will be higher than with a gas tax. An entirely new administrative system will be needed. Costs may change over time as well, especially if other states are involved.
- Perception of double taxation. To avoid a perception of double-taxation, methods for processing gas tax refunds for motorists subject to road usage charges during a potential transition phase will be necessary.
- All solve the problem of revenue erosion equally. Relative to the gas tax, revenue erosion is no longer an issue. However, unless road usage charge rates are indexed to some inflation index, revenue will not keep pace with inflation.
- All will need a rate-setting rationale. Rate structure will need to be addressed so that if a flat tax is imposed, it captures external costs and can accommodate changes to those costs over time.
- Virtually all are more inconvenient than the gas tax. All systems will be more inconvenient than the gas tax because they will require users to pay a new bill or find a way to purchase licenses of some sort. The exception would be a system that does not count miles and is paid at the same time as vehicle registration.

Section 3:

Proposed Work Plan

Proposed Work Plan in Context

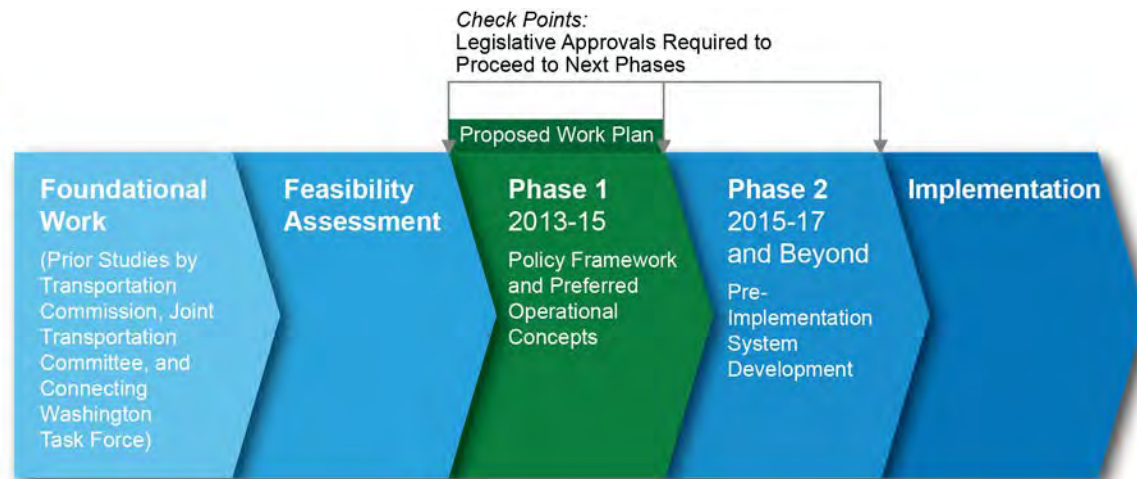
To get from where we are now—“feasible”—to a new system of road usage charging is a complex effort involving potentially contentious policy choices and operational and administrative design decisions. We developed a two-phase process to get to the point where Washington might implement a new road usage charge system.

2013-2015 Biennium: Policy Framework and Preferred Operational Concepts (Phase 1). If authorized by the Legislature, the next phase of work would focus on policy choices, implications, public outreach, and operational concept design to enable the Legislature to decide whether to begin full pre-implementation system development.

2015 and Beyond: Pre-Implementation System Development (Phase 2). If authorized by the Legislature, activity would shift to detailing system features and administrative needs and conducting pilot tests of preferred operational concepts. Phase 2 would be scoped at the end of Phase 1.

Implementation. At the end of Phase 2, if directed by the Legislature, full implementation and transition activities could commence.

Potential Role of Pilot Tests in the Work Plan. Pilot tests can demonstrate technology, administrative systems, or public acceptance before committing extensive resources to a road usage charge system. Pilot tests will be best carried out in Phase 2 once policy direction is established and a preferred operational concept is chosen. See page 50 for more details.



Phase 1: Policy Choices and Operational Concepts Work Plan Overview

Phase 1 will investigate policy issues and operational concepts in enough detail so that decision-makers can understand how a potential system would work, how much it would cost, and what the business implications would be. It will include public outreach and education to ascertain public views and provide information about road usage charging and the reasons why Washington is considering transitioning to it from the gas tax. With this information, the Legislature and Governor can decide whether to move into more detailed pre-implementation system development (Phase 2) of the preferred alternative(s).

The specific tasks for Phase 1 are summarized below, with further details on the pages that follow.

- Conduct public outreach, engagement and education that measures public perspectives, gathers input, and provides information.
 - > Task 1: Measure Public Attitudes and Acceptance
 - > Task 2: Communications and Public Engagement
- Define the policy frameworks and narrow the objectives of a potential road usage charge system.
 - > Task 3: Define Policy Objectives
 - > Task 4: Policy Research
- Establish operational concepts that achieve the policy objectives.
 - > Task 5: Define Operational Concepts
- Conduct initial investigations into system design alternatives to carry out the operational concepts, leaving details for Phase 2.
 - > Task 6: Administrative Design
 - > Task 7: System Architecture and Technical Requirements
- Develop initial business analyses that evaluate costs, risks, transition issues, and interoperability of road usage charging, with detailed development in Phase 2.
 - > Task 8: Business Case
 - > Task 9: Evaluation Framework
 - > Task 10: Interoperability with Other Systems
 - > Task 11: Transition Strategy
 - Task 12: Risk Analysis

Engaging the Public

Task 1: Measure Public Attitudes and Acceptance

Objective. Measure and evaluate public perceptions of road usage charging.

Approach. We will use a combination of surveys starting with the Voice of Washington⁶ survey panel, and supplemented later with focus groups, which will explore concepts in more detail and test messaging strategies.

1A: Baseline evaluation of public perception and understanding related to transportation funding needs, existing revenue sources, and potential road usage charge approaches using the existing Voice of Washington survey panel and supplemented with additional market research to capture a broader population. This would occur towards the beginning of Phase 1.

1B: Interim evaluation, where we explore more specific road usage charge proposals, involving:

- Focus groups to test public reaction to various policy and operational concepts and communication approaches, to understand how people react to alternative ways of describing problems and proposed road usage charging solutions.
- Voice of Washington survey panel, market research, and targeted polling of specific populations and stakeholder groups.

⁶ The Voice of Washington is an Internet survey panel of over 15,000 participants used by the WSTC to test public responses to transportation issues.

Engaging the Public

Task 2: Communications and Public Engagement

Objective. Provide information to the public and engage them in discussions about policy and operational issues.

Approach. Communications and public engagement activities related to road usage charging should consider and be coordinated with communications related to other shorter term transportation funding issues and potential transportation revenue packages. Specific elements include:

2A: Develop a communications plan and update periodically to respond to needs as they arise.

2B: Develop collateral material, such as:

- A more advanced public web site for two-way communication (i.e., provide project information and updates and accept public comment);
- Fact sheet(s) that provides a short, easy-to-understand overview of road usage charging objectives and methods;
- Reference information, including project reports, news stories, reports from around the world, white papers, and other project web sites;
- Informational video(s) on the project;
- Presentations for use with stakeholders and key audiences; and
- Frequently asked questions for external audiences.

Engaging the Public

Task 2: Communications and Public Engagement (continued)

2C: Communications activities, such as:

- Press releases, media briefings, newsletter blasts and interviews with media outlets, timed to coincide with important project milestones;
- Use of social media;
- Media roundtable in advance of party caucuses;
- Web conference for global and national stakeholders;
- Meetings with local stakeholders, including Regional Transportation Planning Organizations, Transportation Choices Coalition, and other transportation stakeholder groups;
- Webinars and on-line forums;
- Op-eds in key media markets;
- Workshops, summits, and open houses with the public;
- Open meetings of the Steering Committee, with opportunities for public comment; and
- Individual briefings of key Legislators and their staff or other stakeholders.

Policy Framework

Task 3: Define Policy Objectives

Objective. Establish a road usage charging policy for Washington State.

Approach. Basic, high-level policy objectives need to be resolved in Phase 1 to provide a framework for the system and operational designs that must follow. These policy objectives will be refined in Phase 2, but the majority of the questions should be addressed in Phase 1. At a minimum, the following policy issues identified in this feasibility assessment should be addressed:

- Relationship to the gas tax. Should a road usage charge replace, supplement, or transition from the gas tax? How do these choices affect the definition of a road usage charge and how it might be implemented?
- Social objectives. Should the road usage charge be used to influence motorist behavior in ways that have different social objectives, such as reducing energy use, greenhouse gas emissions, and congestion, or encouraging transit use?
- Use of revenues. Should revenues raised by a road usage charge be strictly for roadway use (similar to the gas tax) or should there be a broader transportation use of such revenues? How does the 18th Amendment to the Washington Constitution influence this decision?⁷
- Equity among user groups. Should charges account for special situations, such as the amounts that urban or rural motorists might pay, or the ability of poor people to afford the charge? What factors should be considered when considering equity?
- Privacy. How to protect the legitimate expectations for privacy and data security while ensuring accurate charges?
- Rate-setting. How should cost responsibility be measured? How important is it for a road usage charge to reflect actual miles traveled? To what extent are compromises in this desire appropriate to satisfy issues related to technology and/or privacy?
- Out-of-state issues. How important is it for a road usage charge to capture revenue from all out-of-state motorists? How important is it to distinguish Washington residents' in-state versus out-of-state travel?

⁷ The 18th Amendment to the Washington State Constitution dedicates motor fuel tax collections to “highway purposes”.

Policy Framework

Task 3: Define Policy Objectives (continued)

Specific steps in Phase 1 would include:

- A series of workshops with the Steering Committee and potentially a larger group that focus on several policy issues. The workshops would be similar to the Steering Committee meetings conducted for this feasibility assessment, involving presentations of research materials by staff or consultants, plus facilitated discussions aimed at garnering the consensus of workshop participants.
- Legislative briefings for Legislators and their staff as well as the Governor and his staff to ensure that the Steering Committee is heading in a direction that can result in acceptable legislation.
- Draft recommendations, including a determination of whether to move into pre-implementation system development (Phase 2), if supported by the Phase 1 findings.

Policy Framework

Task 4: Policy Research

Objective. Provide the analytical information needed to make informed policy decisions.

Approach. The Steering Committee will identify the research parameters that will enable it to arrive at sound recommendations that can be substantiated and supported by facts and data. Some of the initial policy research needs identified in this feasibility assessment include:

- Forecasts of the size and fuel efficiency of the vehicle fleet, and the amount of vehicle miles driven;
- Quantification of out-of-state travel by Washington residents;
- Quantification of travel in Washington by out-of-state travelers;
- Rate-setting options: Initial research and analysis of rate-setting options based on experiences in other contexts and the Washington State context;
- Preliminary transportation cost allocation evaluation to address road costs allocated to various classes of users, including by geography (counties or regions) and vehicle type (light vehicles, buses, trucks); and
- Preliminary evaluation of how road usage charge revenue should be allocated. Potential dimensions of this question include different highway functional classifications (e.g., freeways, arterials), different modes, different geographies (e.g., counties or regions), and projects that benefit different vehicle types (e.g., cars or trucks).

Operational Concepts

Task 5: Define Operational Concepts

Objective. Define how system users will experience the system when driving and paying charges.

Approach. Take the highest-level policy goals, and transform them into a description of the user's experience. This must occur before any work on designing system architecture or establishing technical requirements (Task 7). In Phase 1, we will:

- Develop a short list of potential operational scenarios, based on the policy direction from Task 4, considering:
 - > Preliminary operational concepts – Construct operational concepts, which involves thinking through the standard driving and payment situations, and developing preliminary approaches to handling them. These include: driving in Washington State; driving out of Washington State; paying an invoice; buying a vehicle; selling a vehicle; setting up an account or purchasing a mileage block; and other similar situations.
 - > Enforcement/Compliance Approach – How to maximize compliance with the system and address nonpayment?
 - > Security – Encryption and authentication measures for data; physical security for system.
 - > Data Privacy and Usage – What measures will be instituted to protect privacy? Also address who reviews possible privacy complaints.
- Work with the Steering Committee to define up to two operational concepts in sufficient detail to prepare preliminary administrative designs and evaluate the business case (Tasks 6, 7, 8).

System Design

Task 6: Administrative Design

Objective. Provide recommendations relating to the administrative functions of a road usage charge.

Approach. Building upon the operational concepts (Task 5), address implementation options by existing or new government agencies and private partners. In Phase 1, we will:

- Identify administrative functions necessary to support road usage charge concepts.
- Evaluate current administrative functions of state agencies, including Departments of Transportation, Licensing, and Revenue, as well as the Transportation Commission and opportunities to cost-effectively integrate new functions into these agencies.
- Evaluate opportunities for outsourcing or other ways of partnering with the private sector, such as through certified service providers and auditors.⁸
- Develop initial recommendations for several potential approaches to administrative systems.

Phase 2 efforts will address administrative design in considerably more detail, working with policy-makers, the Legislature, and Governor, to down-select to a preferred administrative alternative. The work will include designing an organizational transition and implementation plan for implementing the preferred alternative and developing a procurement approach and documentation (including certification) to support any outsourcing or private sector involvement envisioned.

⁸ Please reference Report 2, *Potential Road Usage Charge Concepts for Washington*, pages 40-42 for more detail on these concepts.

System Design

Task 7: System Architecture and Technical Requirements

Objective. Based on the operational concepts defined in Task 5, develop the system architecture – the basic framework for how the system will operate – and detailed technical requirements of the technology.

Approach. Develop preliminary system architecture and technical requirements, adequate for a preliminary assessment of the business case (Task 8). In Phase 1, this will involve:

- Develop system architectures that would accomplish the goals of the operational concepts defined in Task 5.
- Develop draft technical requirements. Requirements are not technical specifications; rather, they explain what the system components and the system as a whole must do, but do not precisely establish how the system must accomplish those tasks. However, all system interfaces – interfaces to existing Washington State systems and interfaces between various parts of the system that need to be procured separately – must be specified precisely.
- Identify information to be exchanged between systems, such as the exchange of lists of registered vehicles subject to the road usage charge.
- Identify communications exchange parameters such as what a transaction entails and how often each transaction is made, or when periodic statements are sent or invoiced in the system design.
- Draft data standards and communications specifications such as the communications protocols and frequencies or the message formats for reporting the mileage data.

Business Analysis

Task 8: Business Case

Objective. Develop a business case based on the preliminary concepts developed in Tasks 5 through 7.

Approach. Evaluate the value proposition of road usage charging for Washington State, considering the cost to implement, operate, and enforce a road usage charge and the resulting revenue streams. It will be used to compare road usage charge alternatives, as well as to compare to other types of State revenues, including the gas tax. In Phase 1, this will involve the following tasks:

- Develop Evaluation Models. Some policy objectives may cost more than they are worth to implement, and there could be variations based on future levels of vehicle miles of travel and fuel consumption. We would build models to evaluate concepts such as:
 - > Involvement of the private sector versus State control over system operations;
 - > Charging out-of-state users versus incurring additional operational and enforcement costs;
 - > Utilizing existing State agencies and resources versus establishing a new agency to administer road usage charges;
 - > Operating advanced technology approaches to road usage charging versus offering simple, low-tech approaches; and
 - > Effects of different levels of vehicle miles of travel and fuel consumption (from Task 4).
- Benefit/cost analysis to allow decision-makers to compare alternative strategies and recommendations regarding a transition toward road usage charging.

Business Analysis

Task 8: Business Case (continued)

- Formal Business Case For Recommended Option(s) to address:
 - > Business case for government, including benefits versus costs, potential risks and mitigations, and comparisons to other approaches, including a “do-nothing” approach.
 - > Business case for Washington State motorists that considers differences in the user experience relating to collection of the road usage charge as well as differences in the quality of the roadway system made possible from a sustainable revenue source.
 - > Business case for the private sector in the event that administrative concepts involve the private sector such as contracted providers of specific services to certified agents operating in an open market. The business case for the private sector entities with experience in providing hardware, software, and services (including customer account management, transaction processing, and revenue collection) depends on the operational concepts pursued and the degree of openness envisioned. This aspect of the business case is often overlooked, but it could be the key to overcoming risks and challenges facing road usage charging.

Business Analysis

Task 9: Evaluation Framework

Objective. Define at the outset the objective criteria by which to evaluate a road usage charge system once it is operational.

Approach. Planning for evaluation of a road usage charge system in the early planning stages ensures that the goals of the project are not lost in the details of system implementation later on. Evaluation can be used both for pilot studies as well as full-scale implementation. In Phase 1, the focus will be on the criteria, with far more detail in Phase 2 related to evaluation procedures.

In Phase 1, we will develop evaluation criteria that might include:

- Policy conformity;
- Public acceptance;
- Technology performance;
- Operational performance;
- Cost;
- Administrative performance;
- Revenue yield; and
- Compliance and enforcement.

Business Analysis

Task 10: Interoperability with Other Systems

Objective. Reduce redundancy with similar systems. Interoperability of systems creates convenience for system users and has the potential to leverage existing systems resulting in lower costs.

Approach. This task will evaluate alternative approaches to interoperability and provide recommendations. The Phase 1 efforts will address the intra-state or inter-state agencies that might be combined, conjoined, or interfaced to make for a more cost-effective and simplified system for motorists or users. These evaluations will, at a minimum address:

- Potential interoperability with existing Washington State revenue systems such as tolling, vehicle registration fees, and gas taxes.
- Potential interoperability with other states and countries. This would include individual states such as Oregon, entities such as the Alliance for Tolling Interoperability and the Western State Alliance – a nascent entity of Western states interested in road usage charging. Additionally, it will address interoperability with British Columbia, Canada as they explore distance based road usage charging for the Province. This investigation would also consider how enforcement can legally work across borders in both the U.S. and Canada and how money transfers can work across the border.
- Possibilities for common certification entities in a multistate context where on-board distance recording devices that are certified in Washington or other states can be used in all jurisdictions without costly re-certification or procuring multiple devices.

Business Analysis

Task 11: Transition Strategy

Objective. Develop a strategy to transition from the gas tax to a road usage charge in phases, recognizing that an all-at-once conversion is likely to be difficult or impossible.

Approach. This task will explore options and approaches for a transition. In Phase 1, we will develop the rudiments and framework for a transition plan:

- Evaluate fleet phase-in options and impacts – Potential options include basing road usage charging liability on miles per gallon rating, on vehicle class, or on vehicle engine technology.
- Assess technology phase-in approaches – Consider issues such as the likely supply of on-board equipment at different time horizons, how to avoid single suppliers, how to support future technology change, integration with current and emerging technology trends such as smartphones, in-vehicle telematics, and connected vehicle systems.
- Assess administrative phase-in approaches – As the system grows, staffing needs and the need for interaction with a greater population of users will grow. This task will evaluate organizational change as the system grows.
- Assess state/interstate/international phase-in approaches – Explore how system expansion would synchronize and be compatible with system rollouts and expansions of other organizations, including other states, such as those in the Western States Alliance and British Columbia.

In Phase 2, with more details in hand from the evaluation of the preferred option(s) and operational concept(s), the transition strategy would be refined to a system design that would be carried forward into implementation.

Business Analysis

Task 12: Risk Analysis

Objective. Identify, quantify, and develop mitigation measures for risks when transitioning to a road usage charge.

Approach. Risk analysis addresses not only the quantitative modeling, but also the communications, legal, administrative design, and other tasks. A log of risks and threats to road usage charge development and implementation will be maintained. Solutions or methods to mitigate these risks will be proposed by the project team and discussed in periodic workshops as well as being integrated into the overall logic process and project processes.

Because the risk analysis is an ongoing task with implications for the overall program development, it should be initiated at the outset of Phase 1. An initial workshop should be conducted with the project team to classify the risks, assign responsibility for researching, analyzing, and developing mitigation approaches, along with a process for logging other risks and conducting follow-up workshops.

As other tasks progress throughout the course of Phase 1, the risk log will be periodically revisited as risks identified from across all tasks feed into it. According to the risk mitigation strategy determined at the first workshop, follow-up workshops will be periodically conducted with the project team to update the inventory, note progress in mitigating risks, and note new risks that have been identified.

Throughout the transition from Phase 1 to Phase 2, should the effort move forward, the risk log will be periodically updated. Workshops with the project team would be convened to develop approaches for addressing risks to program success as defined in the policy objectives.

Potential Phase 2 Activities: Pre-Implementation System Development

Objective. Starting with the preferred operational concepts from Phase 1, develop a road usage charge system that is ready to implement if the Legislature provides authorization.

Approach. Phase 2 will address the system details to develop a road usage charge system that is ready to implement. This will entail activities to refine operational concepts, technology options, agency functions, and services to be procured. There will also be continuing public outreach and communications to explain how the system will operate and how users will interface with the system, as well as continued focus on the business analysis. It is likely that pilot tests will also be part of Phase 2.

The cost and duration of Phase 2 could vary considerably depending on the type of system that emerges from Phase 1. We expect it would take at least two years, and involve the following tasks:

- Public attitudes and acceptance. Advanced evaluation of public attitudes, recognizing that discussion of road usage charging will have been underway for more than two years. Phase 2 will build on Phase 1 efforts and provide greater details and interface information. This will likely involve additional focus groups and surveys.
- Communications and public engagement. Continued attention to communicating with the public about policy direction and decisions, maintaining the project web site, developing materials for speakers to use when talking to community organizations, and preparing op-ed pieces in key media markets.
- Refine policy objectives. Some policy decisions may not be finalized at the end of Phase 1. Continued discussion about the following topics would be appropriate:
 - > Define legal terms. How should legislation define "principal," "measuring instrument," "road usage charge," "public road," and other terms critical to successful implementation of road usage charging policy?
 - > Penalties and enforcement. How will the policy specify penalties and other enforcement regimes?
 - > Government agency and private sector involvement. Which agencies should be responsible for which activities, and what elements could be done by the private sector?

Potential Phase 2 Activities: Pre-Implementation System Development (continued)

- Refine operational concepts. As system details are explored, it may be necessary to make adjustments to operational concepts.
- Detailed administrative design. Working with policy-makers, the Legislature, and Governor, choose a preferred administrative alternative. Design an organizational transition and implementation plan for implementing the preferred alternative. Develop a procurement approach and documentation (including certification) to support any outsourcing or private sector involvement envisioned.
- Detailed system architecture and technical requirements. Starting with high-level material developed in Phase 1, develop detailed system architecture and technical requirements sufficient for procurement. Consult with industry to identify what can be accomplished given the state-of-the-practice, and develop draft technical requirements and specifications, and refine.
- Update business case. Update business case analysis from Phase 1 as details are refined.
- Develop evaluation procedures. Evaluation will involve data collection and methods to evaluate the data, including a timeline. Some procedures may be appropriate on a monthly or annual basis, while others might occur less frequently.
- Interoperability with other systems. Refine interoperability decisions as more information is available from refined operational concepts.
- Transition strategy. Refine the transition strategy addressing the specifics of the selected operational concepts.
- Risk analysis. Throughout the transition from Phase 1 to Phase 2 the risk log will be periodically updated. Workshops would be convened to develop approaches for addressing risks to program success as defined in the policy objectives.
- Pilot tests. Carrying out pilot tests will involve considerable planning, including procuring vendors, testing individual system components, recruiting participants, carrying out the pilot itself, evaluation, and other elements.

The Potential Role of Pilot Tests in the Work Plan

Pilot tests can assess technology, administrative systems, or public acceptance before committing extensive resources to a road usage charge system. With pilot tests, we can:

- Evaluate whether the technology functions as intended, and whether there are any unexpected problems;
- Evaluate how well the system works from the users' perspective; and
- Build confidence with the public and decision-makers for new and unfamiliar systems.

Tests could be of individual components of a system or of an entire system. Pilot tests will be best carried out in Phase 2 once policy direction is established and a preferred operational concept is chosen.

Preparing for, carrying out, and evaluating pilot tests could take anywhere from 18 months to several years, and the cost could vary considerably. Pilot tests and their evaluation in other places have ranged from \$1 million to \$5 million or more depending on their scope and objectives. If Washington State can collaborate with other states or use their information and evaluations, the cost of pilot tests might be minimized. But if the State decides to explore new methods or technologies, more extensive pilot testing could be required and thus cost more.

Pilot tests of road usage charge systems in other places have demonstrated the viability of some technology solutions. Should opportunities to partner with other states emerge before the end of the Phase 1 work plan, there may be benefits to Washington's participation in such demonstrations, within the context of its own emerging policy framework.

A Short History of Road Usage Charge Pilot Studies

Oregon's Pay-at-Pump Approach (2006-2007). Oregon DOT piloted a system whereby cars outfitted with GPS devices could distinguish driving within designated boundaries such as congested urban areas. Mileage data were transferred at the gas station and drivers paid for the total of fuel and miles driven. Reaction against the mandatory GPS component led Oregon to rethink its approach.

Oregon's Open Platform Approach (2012). Oregon developed a second pilot study that tested how motorists might opt in to different mileage recording technologies provided by trusted third-party sources. Participants were legislators and other stakeholders and included users from Washington State. Phase 1 of the pilot is complete and being analyzed and Phase 2 is underway.

University of Iowa Multistate Pilot (2009-2011). The University tested a GPS-based approach to road usage charging. Official results have not yet been published.

Minnesota Mileage Based User Fee Demonstration (2010 – present). Minnesota DOT tested a system that used participants' mobile phones to identify mileage driven in- and out-of-state.

Potential Implementation Tasks After Phase 2

Once road usage charging is ready to implement, there will be a significant effort to actually implement the system. The following is a partial list of tasks that would be needed to move from the end of the work plan described in Section 3 to an operational system.

Pre-operational Phase

- Policy and Communications
 - > Translate legal provisions into processes and rules
 - > Ongoing public communications and education
- Administrative
 - > Create taxing entity and enforcement unit
 - > Contract certification agent
 - > Develop interface with Departments of Licensing and Revenue
- Operational
 - > Refine and finalize operational concepts
 - > Finalize system requirements specifications and interface control documents
 - > Procure technology
 - > Develop communications network
- Business
 - > Cultivate network of certified service providers
 - > Develop evaluation procedures and procure evaluator

Transition Phase

- Policy and Communications
 - > Ongoing communications and education
- Administrative
 - > Implement new organizational structures and processes
 - > Plan for program expansion and interoperability
- Operational
 - > Collect, audit, account for road usage charge
 - > Fine enforcement and collection
- Business
 - > Monitor certified service providers
 - > Evaluate program performance, identify and plan for efficiency improvements, and report periodically to policy-makers

Section 4:

Proposed Budget for Phase 1

Proposed Budget for Phase 1

The proposed budget to carry out Phase 1 of the work plan is \$1.6 million⁹ (see Table 4-1 on the next page). The budget amount could vary according to circumstances that might change from those assumed when preparing this estimate. Some examples of changes that could affect the budget (up or down) include:

- Time lines that are faster or slower than assumed;
- More or fewer road usage charge options to be investigated; and
- Desire for more or less public involvement and communication.

⁹ Note that the Steering Committee did not feel it had the time or expertise to review the details of the budget, and relied on staff from WSDOT and WSTC for this effort.

Table 4-1: Indicative Budget for Phase 1

Task	Purpose	Description	Cost
Engaging the Public			\$390,000
Task 1	Measure Public Attitudes and Acceptance. Understand public perceptions of road usage charging and transportation funding issues.	Use surveys and focus groups to explore public attitudes towards operational concepts and test messaging strategies. Use the Voice of Washington Survey Panel already developed by the Transportation Commission.	\$160,000
Task 2	Communications and Public Engagement. Provide information to the public and engage them in discussions about policy and operational issues.	Execute a communications plan that includes public relations (e.g., media outreach), information dissemination (e.g., reference material), and public involvement (e.g., opportunities for two-way communication).	\$230,000
Policy Framework			\$430,000
Task 3	Define Policy Objectives. Support the Legislature, Commission, and Steering Committee in establishing a road usage charge policy for Washington State.	Explore policy objectives through workshops, facilitated discussions, and legislative briefings resulting in a clear statement of policy objectives on topics such as: relationship to the gas tax, social objectives, use of revenues, equity among user groups, rate setting, and out-of-state issues.	\$170,000
Task 4	Policy Research. Provide the analysis and information to support informed policy decisions.	Conduct policy research into topics such as: fleet and vehicle miles of travel composition trends, forecasts and scenarios; in-state and out-of-state travel; rate-setting options; and preliminary transportation cost and revenue allocation.	\$260,000
Operational Concepts			\$130,000
Task 5	Define Operational Concepts. Define how system users will experience the system when driving and paying charges.	Devise potential operational scenarios and advance up to two operational concepts that address the components of driving and payment situations (e.g., setting up accounts, making payments, and data privacy requirements).	\$130,000
System Design			\$320,000
Task 6	Administrative Design. Provide recommendations relating to the administrative functions of a road usage charge system.	Identify and evaluate the administrative functions of the operational concepts devised in Task 5 with an efficient and effective organizational design for the delivery and operations of the proposed system. Consider both existing and new public and private entities.	\$120,000
Task 7	System Architecture and Technical Requirements. Begin to develop the system architecture and detailed technical requirements of the technology so that the technology can be tested and procured.	For the operational concepts devised in Task 5, develop 1) preliminary system architecture, which is the basic framework for how the system will operate and then 2) determine technical requirements, which includes technology and data flows. These will be adequate for a preliminary assessment of the business case in Task 8.	\$200,000

Task	Purpose	Description	Cost
Business Analysis			\$370,000
Task 8	Business Case. Develop a business case based on the preliminary operational concepts developed in Tasks 5 - 7.	Evaluate the value of road usage charging for Washington State, considering the cost to implement, operate, and enforce a road usage charge system and the resulting revenue streams. Compare road usage charge system alternatives, as well as to other types of state revenues (e.g., gas tax), resulting in an analysis of whether road usage charging makes business sense for the State, motorists, and potential private partners.	\$240,000
Task 9	Evaluation Framework. Provide objective criteria and an approach to evaluate whether the road usage charge achieves its desired results and policy objectives from Task 3.	Define evaluation criteria such as policy conformity, public acceptance, technology performance, operations performance, cost, administrative performance, revenue yield, and compliance and enforcement. It is valuable to consider this well before project implementation.	\$30,000
Task 10	Interoperability with Other Systems. Provide guidelines for road usage charging interoperability with other similar systems such as tolling, fuel taxes, and road usage charges in other jurisdictions.	Assess interoperability with State revenue systems, other states, and countries to reduce redundancy and/or leverage existing systems. This ensures that a road usage charge system does not unduly add to the compliance burden of users and adds value to existing back-office operations.	\$30,000
Task 11	Transition Strategy. Develop a manageable strategy to transition from the gas tax to a road usage charge, potentially in phases.	Develop preliminary approaches to transition from the gas tax to a road usage charge, including fleet phase-in options and impacts; technology phase-in; administrative phase-in; and state/interstate/international phase-in.	\$20,000
Task 12	Risk Analysis. Identify risks and potential mitigation measures to minimize adverse impacts and the cost of such impacts.	Develop an inventory of technical, operational, cost, communications, and policy risks and threats to the development and implementation of a road usage charge, and identify mitigation measures to alleviate uncertainty in the execution of the project.	\$50,000
Total			\$1,640,000

Appendix A:

Steering Committee Member Biographies

Washington State Commissioners

Tom Cowan – San Juan County – Steering Committee, Chair

Tom is a public policy consultant and also manages marine resources restoration projects. Tom was formerly the Director of the congressionally authorized Northwest Straits Commission and was a former Assistant Director for the Puget Sound Action Team. Prior to that, Tom was a San Juan County Commissioner for 12 years and served as President of the Washington State Association of Counties. Tom and his wife owned and operated an electrical contracting firm and the only hardware and building supply store on Lopez Island. Tom is currently the Chair of the San Juan County Land Bank and a Board member of the SeaDoc Society. Tom has lived on Lopez Island for the past 36 years and is a frequent ferry rider. He was appointed to the Commission by Governor Gregoire in 2011.

Anne Haley – Walla Walla County

Anne comes to the Transportation Commission with a breadth of experience on private, public, and nonprofit boards and commissions, and 30 years experience of managing public libraries in Washington. She currently is Chairman of the Board of Directors of Brown & Haley, Tacoma. As Chairman of the Washington State Library Commission, she guided the Washington State Library's merger into the Office of Secretary of State in 2002. She was President of the Washington Library Association and Pacific Northwest Library Association, and Counselor-at-Large of the American Library Association. In Walla Walla, she founded Project Read, sat on the Sherwood Trust Advisory Committee, served as Chairman of the Budget and Allocation Committee of United Way, and served on various community organization Boards. After retiring from the Yakima Valley Library in 2002, she returned to school and earned a BFA degree. Anne was appointed by Governor Gregoire in 2011.

Charles Royer – King County

Charles served three terms as Mayor of Seattle from 1978 to 1989, during which time he also served as President of the National League of Cities. Charles served for five years as Director of the Institute of Politics at Harvard University and Lecturer at the John F. Kennedy School of Government, and later directed the University of Washington's Urban Health Initiative. Charles serves as co-chair of the Seattle Central Waterfront Committee and as co-chairman of the Advisory Committee on Tolling and Traffic Management that is recommending strategies and policies to minimize downtown traffic impacts from the tunnel replacing the Alaskan Way Viaduct. Charles also serves as Chairman of the Major League Baseball Stadium Public Facilities District. Charles was appointed to the Commission by Governor Gregoire in 2012.

Members Required by Legislation

Auto and Light Truck Manufacturers

Curt Augustine is Director of Policy and Government Affairs for the Alliance of Automobile Manufacturers, a national trade association representing domestic and foreign car and light truck manufacturers. He served as chief transportation advisor to California Governor Arnold Schwarzenegger and currently is a contributor and industry representative to the Oregon's Road User Fee Task Force.

Business

Neil Strege is Vice President of the Washington Roundtable, a public policy research and advocacy group comprised of chief executive officers of major Washington state companies. Before joining the Roundtable in February 2012, Neil worked at the King County Council and for a Member of Congress. He is a graduate of Washington State University and life-long resident of Washington State.

Cities

Don Gerend, Councilman, City of Sammamish, is the 2012-2013 President of the Association of Washington Cities. Currently working in real estate, he has a Ph.D. in astronomy from the University of Washington. He formerly worked as a rocket scientist with Boeing and as a Professor of Astronomy and Physics at Seattle University.

Counties

Pete Capell, PE, is County Engineer and Director of Clark County Public Works. He is a member of the Washington State Public Works Board and is Board Chair of the Southwest Washington Chapter of the American Red Cross.

Environmental

Rod Brown, Jr., President, Washington Environmental Council, is a founder and partner of Cascadia Law Group. A graduate of the University of Texas School of Law, he is a Member, Board of Directors, Portland General Electric and served as a Member of the Connecting Washington Task Force.

Motoring Public

Janet Ray is Assistant Vice President of Corporate Affairs and Publishing, AAA Washington. A University of Washington graduate, Janet has been with AAA Washington for 38 years and is the Chairman of the Board of the Bellevue Chamber of Commerce.

Public Transportation

Tom Hingson is the Director of Everett Transit. Tom has led the agency in several projects of regional significance, including the ORCA regional fare card system and the Swift Bus Rapid Transit Agreement with Community Transit. A graduate of Seattle Pacific University with an MPA from the University of Washington, he also performs with the Seattle Opera.

Trucking

Scott Creek is Chairman and CEO of Crown Moving Company, Inc. A graduate of Western Washington University, Scott has been with Crown Moving Company for 34 years. He is a member of the Board of Directors for the Washington Trucking Association and Chairman of its Legislative Committee.

User Fee Technology

Kush Parikh is Senior Vice President of Business Development at INRIX, a worldwide leader in traffic information, driver services and applications. Earlier in his career, he was a product marketing and applications engineer at IBM Microelectronics. Kush holds a MBA from Duke University's Fuqua School of Business and a B.S. in electrical engineering from Pennsylvania State University. He was also recently granted INRIX's first business methodology patent related to data and traffic information.

Legislators

Senator Tracey Eide – Federal Way (D – 30th District).

Senator Ann Rivers – La Center (R – 18th District).

Representative Andy Billig – Spokane (D – 3rd District).

Representative Mark Hargrove – Covington (R – 47th District).

Additional Members Appointed by the WSTC

Kurt Beckett is Chief of Staff for the Port of Seattle. Previously, he served as chief of staff for U.S. Senator Maria Cantwell and worked for Congressman Norm Dicks for nearly 10 years, most recently as district director. He is a graduate of the University of Washington.

Paula Hammond, PE, is Transportation Secretary. A graduate of Oregon State University in civil engineering, she currently chairs three AASHTO Committees: AASHTO Standing Committee on Highways; AASHTO Leadership on High-Speed and Intercity Passenger Rail; and AASHTO Sustainable Transportation Steering Committee.

Cynthia Chen is Associate Professor of Civil Engineering, University of Washington. Her current research interests include land use and travel behavior, the use of GPS in travel surveys, and residential search and location decisions. She chairs the subcommittee on Time Use and Activity and Travel Patterns at the Transportation Research Board (TRB), a division of the National Research Council. She also is a member of the TRB Committees on Travel Behavior and Values and Telecommunications and Travel Behavior.

Sharon Nelson served two terms as Chairman of the Washington Utilities and Transportation Commission (WUTC), from 1985 to 1997 and was Chief of the Consumer Protection Division, in the Washington State Attorney General's office from 2003-2006. She sits on the Board of Directors of Itron, Inc., was a commissioner on the National Energy Policy Commission, and is a former Chair of the Board of Consumers Union, the publisher of Consumer Reports.

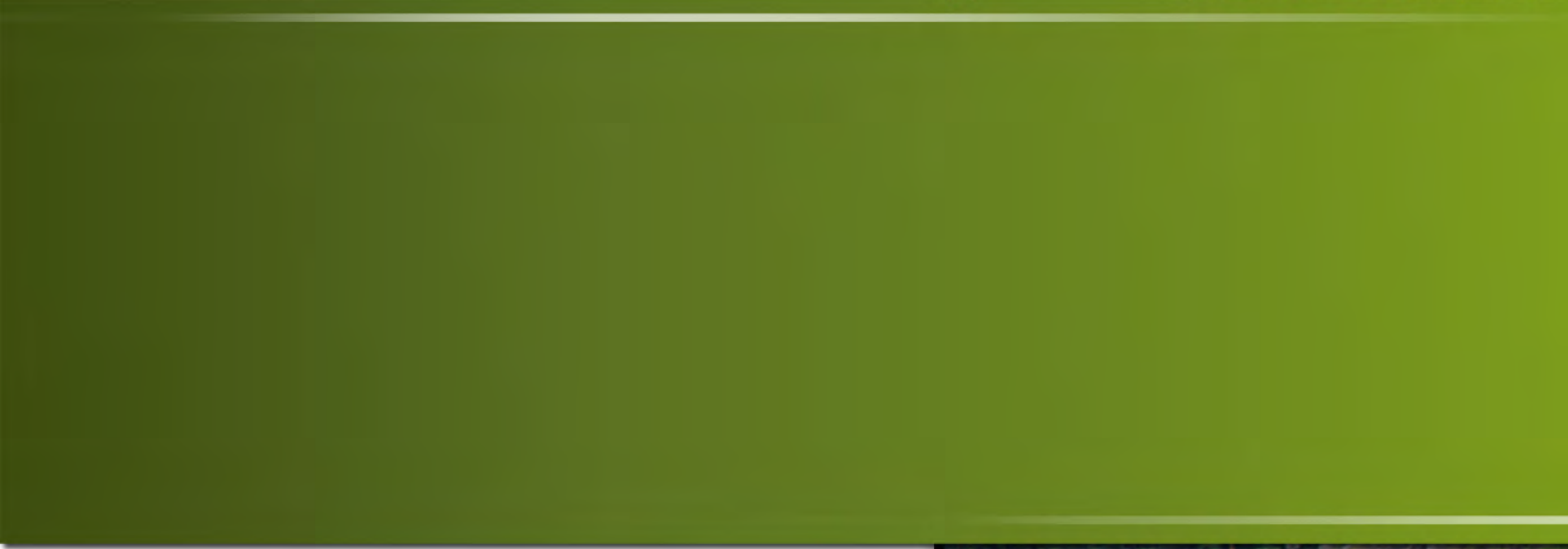
Appendix B:

Summary of Operational Concepts Used for Feasibility Assessment

Concept	Advantages	Disadvantages
Time-Based Concepts		
<p>1. Time Permit Purchase unlimited road network access for a set period of time (e.g., week, month, year).</p>	<ul style="list-style-type: none"> • Proven implementation in Europe (vignette system). • Simple system that can be implemented with no advanced technology, if there is no enforcement for out-of-state vehicles. • Potential stepping stone to more advanced approaches. • Privacy, both actual and perceived, is completely mitigated. • Cross border issues can be solved. • Enforcement is relatively simple for in-state vehicles, requiring only seeing a valid sticker (no odometer match needed). • Out-of-state travel not an issue, since miles are not charged. 	<ul style="list-style-type: none"> • Upfront payment inconvenient and needs to be repeated. With an electronic system, however, automatic replenishment is possible. • Cross-border issues, though solvable, create a significant departure from current practice.
<p>2. Engine Run Time Charge System detects engine run time over a set period (e.g., monthly) and reports charges automatically.</p> <p><i>Three technology alternatives: a) In-vehicle telematics device, b) Aftermarket device with cellular reporting, c) Aftermarket device using principal's smartphone</i></p>	<ul style="list-style-type: none"> • Automates collection of road use data, with a simpler system than collecting mileage data. • More convenient for road users. • Provides more immediate feedback to motorists on amount of driving they do (amount of time their engine is running). • Offers customer choices in technology. • Opportunity to piggyback on existing service providers. • Reflects not only cost of miles, but also environmental costs and costs of congestion (since time spent idling is charged the same as time spent moving) – similar to the gas tax. 	<ul style="list-style-type: none"> • Relationship between payment and benefit received not as close as with mileage. • Upfront equipment and costs for users. • Some vehicles may not have technology capabilities – creates a two-tiered system – those that can afford (or are willing to use) an automated system, and those that cannot. • Automated equipment in cars may lead to perception of loss of privacy (though there are ways to handle this). • Will not work the same on hybrid-electric and electric vehicles.

Concept	Advantages	Disadvantages
Distance-Based Concepts		
<p>3. Mileage Permit Purchase a license to drive a certain number of miles.</p>	<ul style="list-style-type: none"> • Proven implementation in New Zealand. • Simple system that can be implemented with no advanced technology. • Potential stepping stone to more advanced approaches. • Privacy, both actual and perceived, is completely mitigated. • Cross border issues can be mitigated. 	<ul style="list-style-type: none"> • Upfront payment inconvenient and needs to be repeated. • Enforcement is burdensome, requires seeing both the distance license and the odometer. • Cross-border issues though solvable, create a significant departure from current practice. • Out-of-state travel not easily refunded.
<p>4. Estimated Annual Mileage Permit with Reconciliation Pay for estimated mileage for a set period, then reconcile the account based on actual distance driven periodically (monthly, quarterly).</p>	<ul style="list-style-type: none"> • Simple system that can be implemented with no advanced technology. • Privacy, both actual and perceived, are completely mitigated. • Potential stepping stone to more advanced approaches. • Cross border issues can be solved. 	<ul style="list-style-type: none"> • Upfront payment inconvenient, needs to be repeated, and introduces reconciliation process, another step. • Cross-border issues though solvable, create a significant departure from current practice. • Out-of-state travel not easily refunded.
<p>5. Simple Odometer or Other Mileage Reading Principal reports mileage at the end of a period (e.g., quarterly) and pays the corresponding amount owed.</p>	<ul style="list-style-type: none"> • Simple system that can be implemented with no advanced technology. • Potential stepping stone to more advanced approaches. • Privacy, both actual and perceived, is completely mitigated. • Cross border issues can be solved. • No need for reconciliation saves a step. 	<ul style="list-style-type: none"> • Government cash flow – revenue not received until after travel is completed. • Cross-border issues though solvable, create a significant departure from current practice. • Out-of-state travel not easily refunded.
<p>6. Automated Mileage Reporting System detects mileage traveled and reports charges automatically at the end of a period (monthly, quarterly).</p> <p><i>Three technology alternatives: a) OBD-II dongle with cellular modem, b) OBD-II dongle with Bluetooth to smartphone, c) Vehicle telematics</i></p>	<ul style="list-style-type: none"> • Automates collection of road use data. • More convenient for road users. • Provides more immediate feedback to motorists on amount of driving they do and related costs. • Offers customer choices in technology. • Opportunity to piggyback on existing service providers. 	<ul style="list-style-type: none"> • Upfront equipment and costs for some users. • Some vehicles may not have technology capabilities – creates a two-tiered system – those that can afford (or are willing to use) an automated system, and those that cannot. • Automated equipment in cars may lead to perception of loss of privacy (though there are ways to handle this).

Concept	Advantages	Disadvantages
<p>7. Automated Mileage and General Location Measurement System detects mileage traveled by geographic zone over a set period of time (e.g., monthly) and reports charges, with rates set by zone.</p> <p><i>Three technology alternatives: a) Existing vehicle telematics with GPS, b) User-provided smartphone + OBD-II backup dongle, c) Third-party GPS device with cellular modem</i></p>	<ul style="list-style-type: none"> • Adds ability to differentiate miles driven in different locations to address in-state/out-of-state concerns and rudimentary congestion pricing. • Automates collection of road use data. • More convenient for road users. • Provides more immediate feedback to motorists on amount of driving they do and costs. • Offers customer choices in technology. • Opportunity to piggyback on existing service providers. 	<ul style="list-style-type: none"> • Upfront equipment and costs for users. • Some vehicles may not have technology capabilities – creates a two-tiered system – those that can afford (or are willing to use) an automated system, and those that cannot. • Automated equipment in cars may lead to perception of loss of privacy, especially with general location component (though there are ways to handle this). • General location component allows for differential pricing by region – something that some populations may not appreciate.
<p>8. Automatic Mileage and Specific Location Measurement System detects mileage traveled by geographic zone over a set period of time (e.g., monthly) and reports charges, with rates set by road segment or type of road.</p> <p><i>Three technology alternatives: a) Existing vehicle telematics with GPS, b) User-provided smartphone + OBD-II backup dongle, c) Third-party GPS device with cellular modem</i></p>	<ul style="list-style-type: none"> • Adds ability to differentiate miles driven on specific roads to allow for differential pricing by road or congestion pricing. Also handles in-state/out-of-state concerns and rudimentary congestion pricing. • Automates collection of road use data. • More convenient for road users. • Provides more immediate feedback to motorists on amount of driving they do. • Offers customer choices in technology. • Opportunity to piggyback on existing service providers. 	<ul style="list-style-type: none"> • Upfront equipment and costs for users. • Some vehicles may not have technology capabilities – creates a two-tiered system – those that can afford (or are willing to use) an automated system, and those that cannot. • Automated equipment in cars may lead to perception of loss of privacy, especially with general location component (though there are ways to handle this). • Specific location component allows for differential pricing by specific road – something that some populations may not appreciate – potentially even more than general location.



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A-18

WASHINGTON STATE RUC ASSESSMENT,
BUSINESS CASE EVALUATION FINAL REPORT

January 7, 2014

 **WA RUC**

Business Case Evaluation Final Report

*Prepared for:
Governor Jay Inslee
and
Washington State Legislature*

January 7, 2014



**Washington State
Transportation Commission**



**Washington State
Department of Transportation**

**CAMBRIDGE
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January 7, 2014

The Honorable Governor Jay Inslee
Office of the Governor
PO Box 40002
Olympia, WA 98504-0002

The Honorable Curtis King
Co-Chair, Senate Transportation Committee
PO Box 40482
Olympia, WA 98504-0482

The Honorable Tracey Eide
Co-Chair, Senate Transportation Committee
PO Box 40482
Olympia, WA 98504-0482

The Honorable Judy Clibborn
Chair, House Transportation Committee
PO Box 40600
Olympia, WA 98504-0600

The Honorable Ed Orcutt
House Transportation Committee
PO Box 40600
Olympia, WA 98504-0600

Dear Governor Inslee, Senators King and Eide, and Representatives Clibborn and Orcutt:

We are pleased to submit the second installment of our Road Usage Charge Assessment, which is a culmination of work led by our stakeholder Steering Committee over the 2013 legislative interim. This assessment is being conducted to prepare our state for a future that is likely to be much different from our past. As cars become more fuel-efficient and alternative fuel vehicles become more common, the long-term sustainability of the gas tax as a primary revenue source for transportation will steadily decline.

Responding to this concern, in 2012 the Legislature and Governor directed the Washington State Transportation Commission (WSTC) to convene a stakeholder Steering Committee and assess the feasibility of a Road Usage Charge as a potential replacement for the State's gas tax.

Business Case Evaluation, Final Report

January 7, 2014

That work was completed last year and the key finding was that road usage charging was a feasible option for funding Washington's transportation system.

The 2013 Legislature and Governor directed this work to continue, charging the WSTC and its Steering Committee to determine if there is a business case to be made for road usage charging in Washington State. Sounds simple, but this turned out to be an extraordinarily complex undertaking to accomplish in just six months. Nonetheless, we were able to make great strides over the 2013 legislative interim and have arrived at the findings and recommendations embodied in this report.

We evaluated key policy issues, possible operational concepts, whether there was a business case to be made, and identified implementation issues. The Steering Committee identified a policy framework to guide the business case analysis, with one goal: ***Identify and develop a sustainable, long-term revenue source for Washington State's transportation system to transition from the current gas tax system.***

We have tried to make the communication of this somewhat complex topic easy to digest and understand. We encourage you to read this report to fully understand the details and complexities of this possible transition. But, we have also made it easy if you have limited time: if you have five minutes, the Prologue is one page and provides a snap-shot synopsis of what we accomplished and the key findings; if you have 10 minutes, you can read the Executive Summary which boils down the work and findings in seven pages. We have also included in this report our recommended 2014/15 work plan and budget request for this work to continue. You can find this detail in Section 6 of the report.

We look forward to continuing this important work and welcome your guidance and support in the coming session and beyond.

Very truly yours,



Tom Cowan
Chair, Road Usage Charge Steering Committee
Vice-Chair, Washington State Transportation Commission

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Appendices are provided on the enclosed CD

Appendix A: Business Case Evaluation Financial Analysis Assumptions	Appendix
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Also provided on the CD are the foundational materials used by the Steering Committee to reach the conclusions in this report. These are listed on the following page.

For more information on the Road Usage Charge Assessment, please visit the Transportation Commission's web site at: www.wstc.wa.gov or you can visit the project web site at: <http://waroadusagecharge.wordpress.com>.



Additional Documents Contained on CD

2013 Business Case Evaluation

Interim Reports: Business Case Evaluation

- Report 4: Proposed Road Usage Charge Concepts for Business Case Evaluation, Steering Committee Meeting #6 Briefing Material, June 5, 2013
- Report 5: Briefing Materials for Discussion at Steering Committee Meeting #7, September 6, 2013
- Report 6: Preliminary Business Case Evaluation, Steering Committee #8 Briefing Material, October 7, 2013

Steering Committee Presentations: Business Case Evaluation

- Steering Committee Meeting #5, April 4, 2013
- Steering Committee Meeting #6, June 11, 2013
- Steering Committee Meeting #7, including Oregon DOT presentation, September 12, 2013
- Steering Committee Meeting #8, October 14, 2013
- Steering Committee Meeting #9, November 18, 2013

2012 Feasibility Assessment

- Final Report: Feasibility Assessment, Work Plan & Budget, January 23, 2013 (also referred to as Report 3)
- Report 1: Domestic and International Review and Policy Context, Steering Committee #1 Briefing Material, September 13, 2012
- Report 2: Potential Road Usage Charge Concepts for Washington, Steering Committee #2 Briefing Material, October 23, 2012
- Steering Committee Meeting #1 Presentation, September 13, 2012
- Steering Committee Meeting #2 Presentation, October 30, 2012
- Steering Committee Meeting #3 Presentation, December 4, 2012
- Steering Committee Meeting #4 Presentation, January 11, 2013

The 2013 Steering Committee

Name and Affiliation	Representing	Name and Affiliation	Representing
Steering Committee Chair, Commissioner Tom Cowan (WSTC Commissioner)	WSTC	Rod Brown Jr. (Cascadia Law Group PLLC)	Environmental
Commissioner Anne Haley (WSTC Commissioner)	WSTC	Pete Capell (Clark County Public Works)	Counties
Commissioner Charles Royer (WSTC Commissioner)	WSTC	Cynthia Chen (University of Washington)	Appointed by WSTC
Sen. Tracey Eide (Federal Way (D) 30 th District)	Washington Senate	Scott Creek (Crown Moving Company, Inc.)	Trucking industry
Sen. Curtis King (Yakima (R) 14 th District)	Washington Senate	Don Gerend (City of Sammamish Councilmember)	Cities
Sen. Andy Billig (Spokane (D) 3 rd District)	Washington Senate	Tom Hingson (Everett Transit)	Public transportation
Rep. Judy Clibborn (Mercer Island (D) 41 st District)	Washington House of Representatives	Sharon Nelson	Appointed by WSTC
Rep. Jake Fey (Tacoma (D) 27 th District)	Washington House of Representatives	Lynn Peterson (WSDOT Secretary)	Appointed by WSTC
Rep. Linda Kochmar (Federal Way (R) 30 th District)	Washington House of Representatives	Janet Ray (AAA Washington)	Motoring public
Rep. Ed Orcutt (Kalama (R) 20 th District)	Washington House of Representatives	Neil Strege (Washington Roundtable)	Business
Curt Augustine (Alliance of Automobile Manufacturers)	Auto and light truck manufacturers	Ted Trepanier (INRIX)	User fee technology
Kurt Beckett (Port of Seattle)	Appointed by WSTC		

Prologue — What We Did...

The Legislature directed us to study policy issues, refine operational concepts, and evaluate the business case for road usage charging as a possible replacement for the Washington State gas tax.

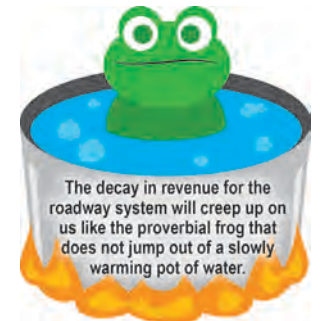
A road usage charge is a way for drivers to pay for the use and maintenance of the Washington road system based on distance traveled rather than taxing gasoline by the gallon.

Last year, we found that road usage charging was feasible in Washington. This year, we found that a business case could be made for three potential road usage charge concepts or combinations of concepts that provide drivers a choice of approaches:

- A: Time Permit — A flat fee to drive a vehicle an unlimited number of miles for a given period of time (e.g. a month or a year);
- B: Odometer Charge — A per-mile charge measured by odometer readings; and,
- C: Automated Distance Charge — A per-mile charge measured by in-vehicle technology that can distinguish between in-state and out-of-state travel with periodic billing.

Key Findings

- The road usage charge systems we evaluated will cost more to collect than the gas tax, but should generate greater and more stable net revenue over 25 years.
- Providing drivers choices as to how they pay a road usage charge will help improve public acceptance and mitigate privacy concerns;
- Gas tax increases can raise more net revenue in the short term than the road usage charges we evaluated, but over the long term will continue to erode in value, thus requiring frequent increases; and
- A road usage charge system with choice helps ensure everyone pays more of their fair share for using the roads, regardless of fuel source or miles per gallon.



Next Steps

- Continue these investigations so that Washington has options developed when action may be needed in the future; and
- Refine road usage charge concepts to address policy, technical, and public acceptance issues that have been identified.

Executive Summary

This evaluation started with a policy framework constructed by the Steering Committee, picking up where last year's feasibility evaluation left off (see Section 2).

- Last year, we found that road usage charging was feasible in Washington. This year, we tested the business case.
- We evaluated road usage charging policy issues, operational concepts, and whether there was a business case, and identified implementation issues.
- The Steering Committee recommended a policy framework that guided the business case evaluation, with one goal and 13 guiding principles.
 - Goal: **Identify and develop a sustainable, long-term revenue source for Washington State's transportation system to transition from the current gas tax system.**
 - Guiding Principles (not in priority order) on how we would implement the goal:




- Privacy
- Transparency
- Complementary policy objectives
- Cost-effectiveness

- Equity
- Data Security
- Simplicity
- Accountability
- Enforcement

- System Flexibility
- User Options
- Interoperability and Cooperation
- Phasing

- There are some principles that the Steering Committee considers to be important, but on which it deferred recommendation:
 - Whether to distinguish between travel on Washington public roads and other roads (e.g., private and outside the State).
 - Whether people from outside Washington should pay.

We evaluated three operational concepts that represent a range of potential ways to implement road usage charging, plus combinations of concepts (see Section 3).

A: Time Permit	Principals buy permits to drive an unlimited number of miles for a given period (e.g., a year, a quarter, or a month).	
B: Odometer Charge	Principals estimate the number of miles they expect to drive in a year and reconcile the amounts at the end of the year.	
C: Automated Distance Charge	Principals install devices in their vehicles that record mileage and transmit usage data to an entity ¹ that submits bills and collects revenue.	
Combinations of A, B, and C		

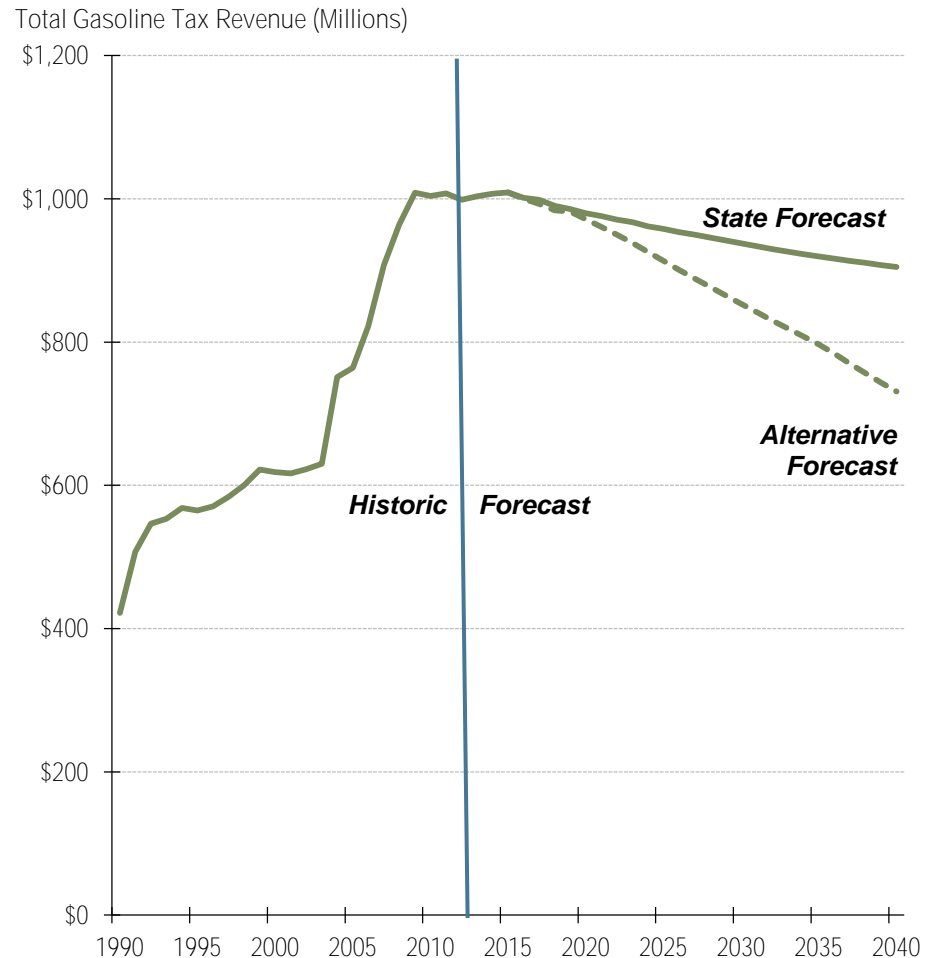
What are "Principals"?
Throughout the study, we have referred to the person responsible for paying a road usage charge as the "Principal," recognizing that the "driver" or "owner" of a vehicle is not always the person responsible.

¹ For purposes of this preliminary analysis, we assume that government is the entity billing and collecting revenue, recognizing the potential for outsourcing if private entities could bid lower prices than government is able to provide.

The business case evaluation considered financial and non-financial aspects, so that policymakers can balance the two (see Section 4).

- The Steering Committee’s goals and guiding principles were the basis for performance criteria.
- Two key assumptions kept the analysis simple:
 - Road usage charges would replace the gas tax in 2015, with little transition period,² at a rate equal to expected gross gas tax revenue in 2015; and
 - Road usage charges would apply to all vehicles that do not use diesel fuel.
- We developed a financial model of costs and revenues for road usage charges and gas taxes for a range of forecast scenarios for 2015-2040.
 - Future fuel economy and resulting gas tax revenue were the most influential financial assumptions (see gas tax forecast chart at right.)

Historic and Forecast Gas Tax Revenue
FY 1990 to FY 2040



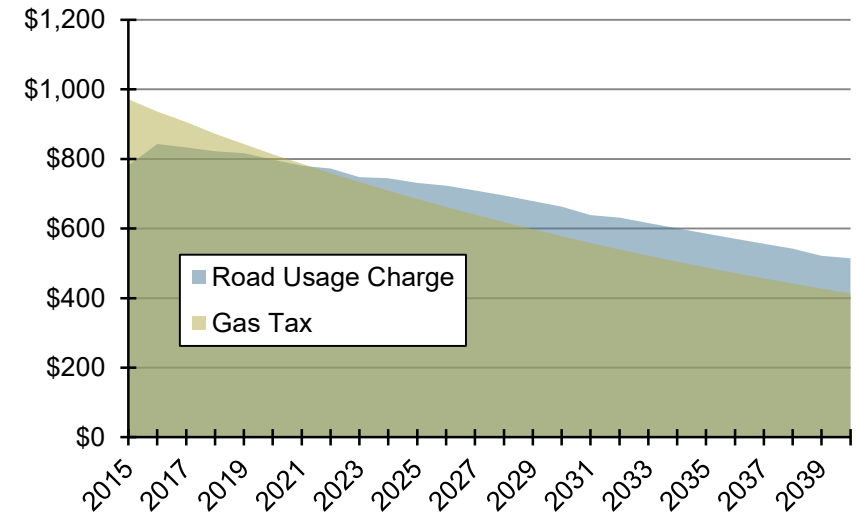
² Note that this assumption is neither likely nor desirable; it was made only to simplify the analysis.

All of the road usage charge concepts we evaluated performed better financially than the gas tax—operating costs and fuel economy forecasts determined this outcome.

- We estimate road usage charging to yield from \$0.3 billion to \$3.0 billion more net revenue than the gas tax between 2015 and 2040 depending on the concept and fuel efficiency forecast.
- Operating Costs.
 - Concepts A (Time Permit) and B (Odometer Charge) are least expensive (7 to 8 percent of revenue), and would generate the highest net revenue.
 - Concept C (Automated Distance Charge) is 12 to 13 percent.
 - Concept A, B, and C combination is just under 10 percent.
 - The cost to collect the gas tax is estimated at 0.4 to 0.6 percent.
 - The cost to collect the road usage charge concepts includes evasion losses and costs to recover unpaid bills—gas tax costs do not include these items.
- Net revenue from gas tax would be higher in the earlier years due to the startup costs of a new road usage charge system.
 - For the combination of Concepts A, B, and C, net road usage charge revenue is expected to exceed gas tax revenue after eight years, and the total net present value of the road usage charge would exceed that of the gas tax by \$2 billion (see chart above).
- None of the sensitivity tests we conducted changed the outcome that road usage charging would yield more net revenue over time for Washington than the gas tax.
- Changes in fuel economy assumptions had the most leverage on the outcome—using the state implied forecast for fuel efficiency changed the difference in net present value for Concept A+B+C to \$1.0 billion.

Annual Net Revenue of Road Usage Charge Concept Combination A, B and C Compared to Gas Tax

\$ Millions - Present Value (2014\$)



Note: Assumes Global Insight forecast for fuel efficiency

When considering the non-financial evaluation criteria, all three road usage charge concepts tested had advantages and disadvantages.

- No single concept tested was a clear front-runner - each has advantages and disadvantages which need to be weighed against the financial criteria.
- Different people will view these advantages and disadvantages differently.

Concept	Advantages	Disadvantages
Gas Tax	<ul style="list-style-type: none"> ■ Simple ■ Easy to enforce ■ No privacy issues 	<ul style="list-style-type: none"> ■ Long-term declining revenue source due to increased fuel economy and decrease in driving ■ Not transparent. People recognize it as a tax, but are not aware of the amount, payment, or use ■ Imperfect proxy for road usage in that it varies greatly according to the fuel economy of individual vehicles
Concept A: Time Permit	<ul style="list-style-type: none"> ■ Transparent ■ Relatively simple to use ■ Easy to enforce ■ No privacy issues 	<ul style="list-style-type: none"> ■ No relationship to road use
Concept B: Odometer Charge	<ul style="list-style-type: none"> ■ Transparent ■ Relatively simple to use ■ Easy to enforce ■ Privacy not a significant issue (but Principals might object to mileage reporting) ■ Strong relationship to use 	<ul style="list-style-type: none"> ■ No differentiation between driving in-state, out-of-state or on private roads
Concept C: Automated Distance Charge	<ul style="list-style-type: none"> ■ Transparent ■ Strongest relationship to use, recording miles driven in-state, out-of-state, or on private roads 	<ul style="list-style-type: none"> ■ More complicated to use than others ■ Perception of privacy infringement ■ More difficult to enforce

The Steering Committee found that the business case for road usage charging has been made as a long-term gas tax replacement.

- The gas tax is still a viable source of revenue, however, all signs point toward gradual improvement in fuel efficiency of internal combustion engines, which will result in declining revenue from the gas tax.
 - The pace at which the fleet becomes more fuel efficient will determine how much better the road usage charge system would be than continuing with the current gas tax—this pace is highly uncertain, leading to uncertainty in the business case outcomes.
- In the short-term, gas tax increases can make up for the declining value of the gas tax, but the issue of declining gas tax revenue over time would remain.
- As gas-burning vehicles become more fuel efficient, these more efficient vehicles will pay less per mile in gas tax than vehicles that burn more gasoline:
 - Many people find this inequitable, but this inequality can also be seen as being consistent with other energy and emission reduction policies in Washington:
 - Greenhouse gas (GHG) emission reduction goals and requirements³;
 - Vehicle miles of travel (VMT) reduction benchmarks per capita⁴;
 - Installation of outlets for electric vehicle charging at State’s fleet parking and maintenance facilities⁵; and
 - Fuel economy standards for the State vehicle fleet.⁶

³ RCW 70.235.020 and RCW 70.235.050.

⁴ RCW 47.01.440.

⁵ RCW 43.19.648.

⁶ RCW 43.41.130.

The Steering Committee expressed broad consensus to move forward with further development of all three road usage charge concepts (see Sections 5 and 6).

The Steering Committee recommended:

- The work plan for 2014/2015 addresses the issues that would need to be resolved to move road usage charging forward in the 2015 legislative session.
 - First priority – Information to refine the concept of operations and explore transition options.
 - Second priority – Information to inform the 2015 Legislative session.
 - Third priority – Information to enable implementation, but which is not needed for the 2015 legislative session, and can be deferred.
- The work plan includes the following tasks:
 - Refine policy direction addressing the highest priority issues
 - Develop a concept of operations – the next tier of work needed before testing or implementation can occur.
 - Risk analysis
 - Financial evaluation
 - Documentation
 - Planning for a pilot/transition, which could occur in the first half of 2015, with the concurrence of the legislature.
- The Transportation Commission agreed and set forth a proposed budget to achieve the first and second priority work identified above:
 - The proposed budget to accomplish this work is \$869,000, with \$321,000 to fund work from March 2014 - June 2014 and \$548,000 to fund the remaining work from July 2014 - June 2015.
 - For further detail on the proposed budget and work plan, please refer to page 67.

Section 1: Introduction

The 2013 phase of the road usage charge evaluation established policy objectives, explored operational concepts, tested whether there was a business case, and identified implementation issues.

- The 2013 Legislature provided funding to the Commission to evaluate the business case for a transition from a gas tax to a road usage charge system as the basis for funding the State’s transportation system:
 - The funding was provided for fiscal year 2014 only.
 - The business case evaluation is due to the Governor and the Transportation Committees of the Legislature in time for inclusion in the 2014 supplemental transportation Omnibus Appropriation Act.
- The Commission was directed to:⁷
 - Develop preliminary road usage charge policies that are necessary to develop the business case, as well as supporting research.
 - Develop the preferred operational concept(s) that reflect the preliminary policies.
 - Evaluate the business case and assess likely financial outcomes.
 - Identify and document policy and other issues that are deemed important to further refine the preferred operational concept or concepts and to gain public acceptance. These issues should form the basis for continued work beyond this funding cycle.

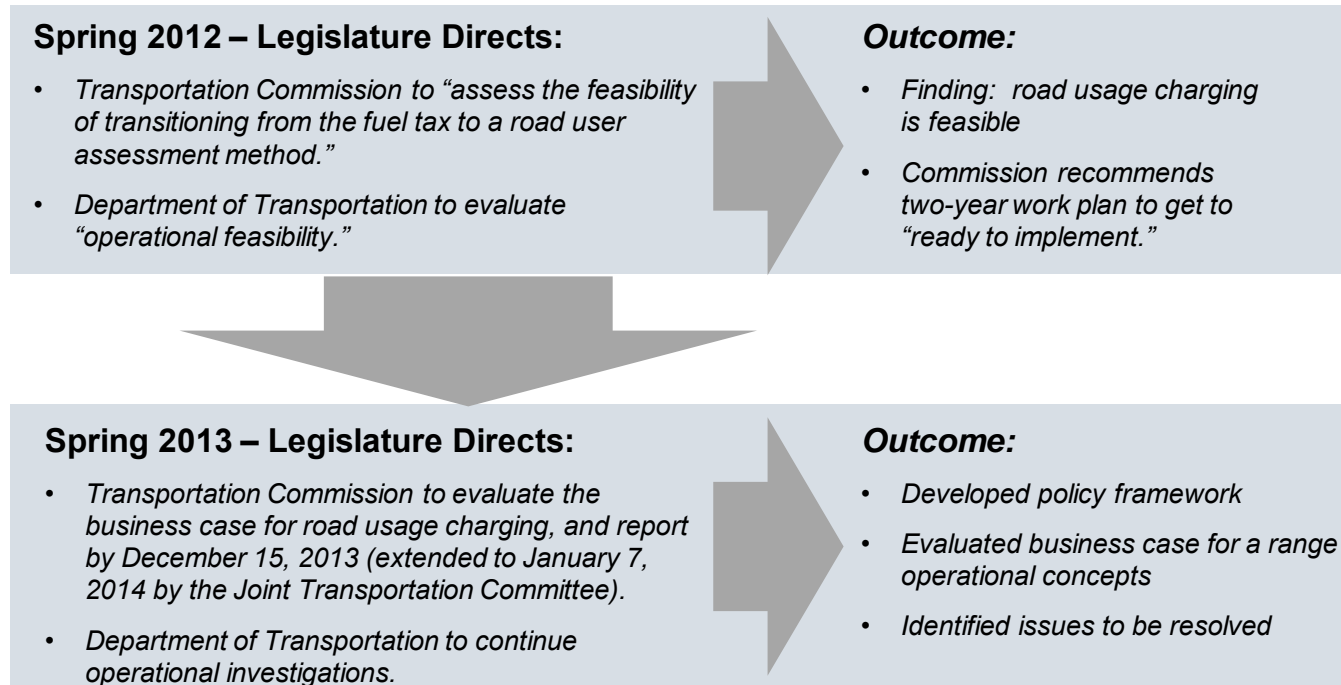
⁷ ESSB 5024 Section 205(3).

In 2012, the Legislature directed an assessment to determine the feasibility of a road usage charge.

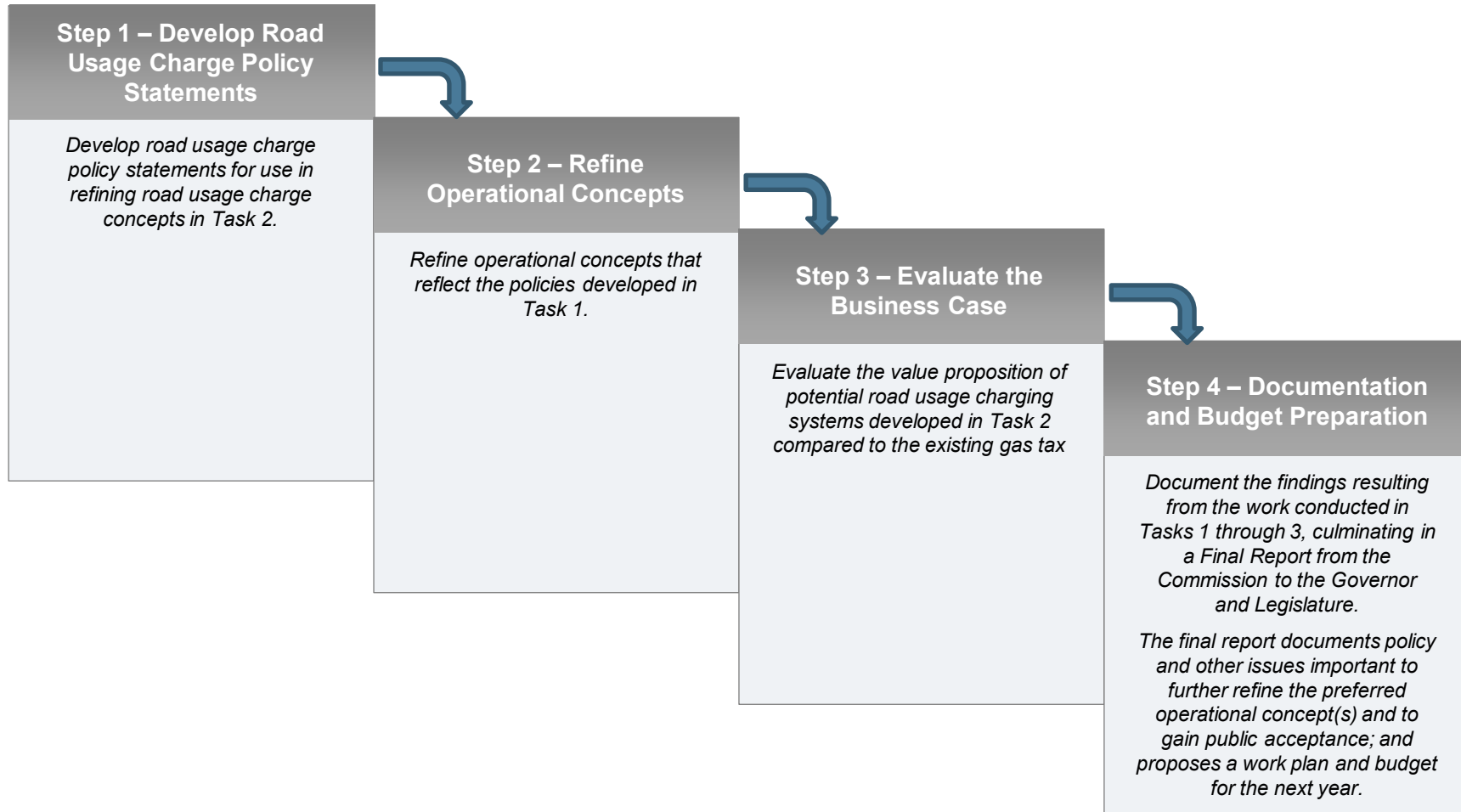
- The 2012 Legislature provided funding to the Commission “solely to determine the feasibility of transitioning from the gas tax to a road user assessment system of paying for transportation.”
- The Legislature also provided funding to the Washington State Department of Transportation (WSDOT) “solely to carry out work related to assessing the operational feasibility of a road user assessment, including technology, agency administration, multistate and Federal standards, and other necessary elements.” Both efforts were conducted under the guidance of a Steering Committee.

Overview of Legislative Directives from 2012 and 2013 and Their Outcomes

- The Steering Committee recommended to the Commission, and the Commission agreed that road usage charging was feasible and that further work was needed to get to the “ready to implement” stage.
- The figure on this page provides an overview of the 2012 and 2013 legislative directives and outcomes.



The 2013 evaluation began by clarifying policy objectives, proposing illustrative operational concepts, then evaluating the business case.



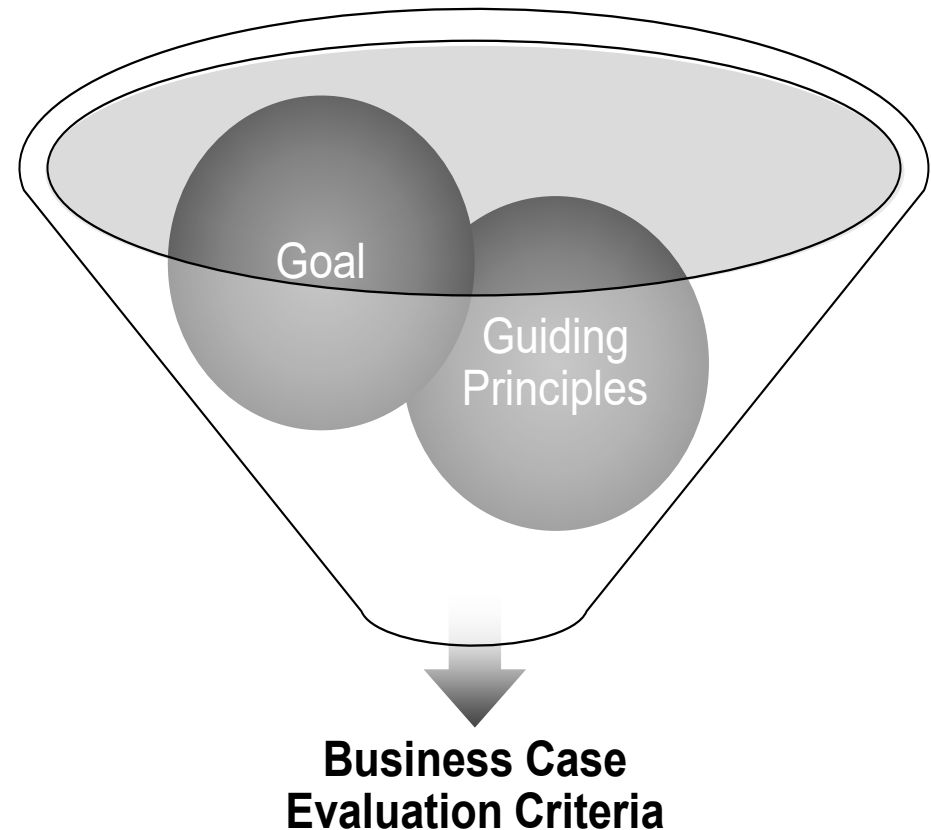
The Steering Committee found that the business case for road usage charging has been made, and that continuing work should further develop the concept of operations and resolve outstanding issues.

- These are the key findings and recommendations, detailed on the pages that follow:
 - Gasoline consumption and tax revenue are forecast to decline due to improving fuel economy.
 - Road usage charging can be a long-term gas tax replacement.
 - The business case for road usage charging has been made.
 - The Steering Committee expressed broad consensus to move forward all three road usage charge concepts evaluated and to start addressing implementation issues.
- In the remainder of this report, we:
 - Explain the policy framework underpinning our work (Section 2).
 - Summarize the operational concepts evaluated (Section 3).
 - Provide our business case analysis, including comparisons of the effect that different road usage charge concepts would have on different types of drivers (Section 4).
 - Identify policy and other issues to further refine the preferred operational concepts and to gain public acceptance (Section 5).
 - Provide a proposed work plan and budget for 2014 and 2015 (Section 6).
- There are also appendices in a separate document:
 - A. Update of business case evaluation (quantitative and qualitative);
 - B. Forecast details; and
 - C. Business case cost evaluation.

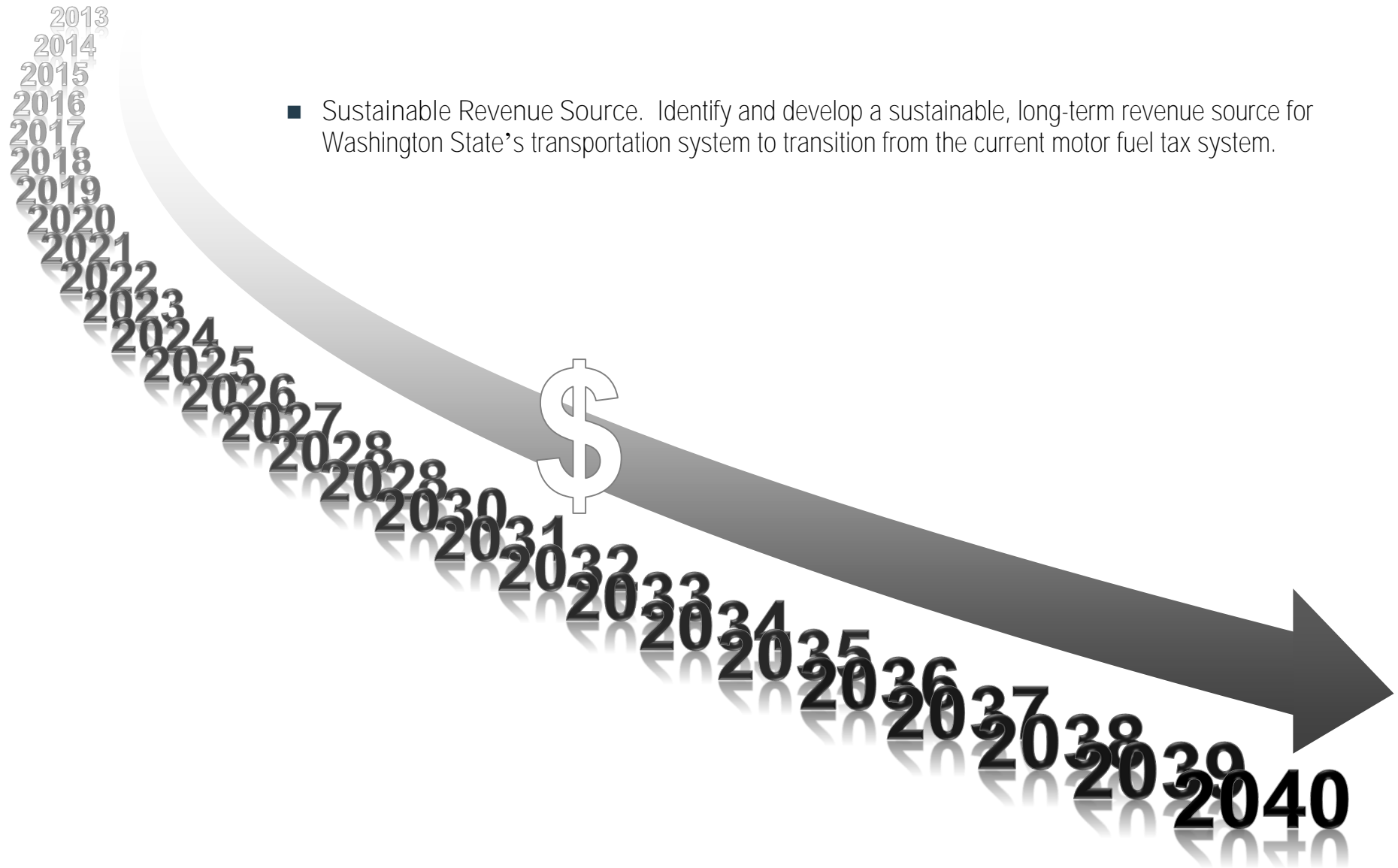
Section 2: Policy Framework

The Steering Committee recommended a policy framework that guided the business case evaluation.

- The Steering Committee developed a single goal and 13 guiding principles to guide the business case evaluation of potential road usage charge concepts
- The goal and guiding principles were translated into performance criteria that were used to evaluate the business case for the road usage charging concepts.
- The goals and guiding principles are subject to modification over time, but provide a reasonable starting point for evaluation.
- Not all the potential road usage charge concepts are fully consistent with all the guiding principles:
 - These differences can form some of the basis for choosing among the alternative proposals.



The Steering Committee recommended one goal that answers the question, “why are we doing this?”



The Steering Committee recommended 13 guiding principles on how we would implement the goal.

Transparency	A road usage charge system should provide transparency in how the transportation system is paid for.
Complementary policy objectives	A road usage charge system should, to the extent possible, be aligned with Washington’s energy, environmental, and congestion management goals.
Cost-effectiveness	The administration of a road usage charge system should be cost-effective and cost efficient.
Equity	All road users should pay a fair share with a road usage charge.
Privacy	A road usage charge system should respect an individual’s right to privacy.
Data Security	A road usage charge system should meet applicable standards for data security, and access to data should be restricted to authorized people.
Simplicity	A road usage charge system should be simple, convenient, transparent to the user, and compliance should not create an undue burden.
Accountability	A system should have clear assignment of responsibility and oversight, and provide accurate reporting of usage and distribution of revenue collected.
Enforcement	A road usage charge system should be costly to evade and easy to enforce.
System Flexibility	A road usage charge system should be adaptive, open to competing vendors, and able to evolve over time.
User Options	Consumer choice should be considered wherever possible.
Interoperability and Cooperation	A Washington road usage charge system should strive for interoperability with systems in other states, nationally, and internationally, as well as with other systems in Washington. Washington should proactively cooperate and collaborate with other entities that are also investigating road usage charges.
Phasing	Phasing should be considered in the deployment of a road usage charge system.




There are some principles that the Steering Committee thinks are important, but deferred recommendation.

- Ability to distinguish between travel on Washington public roads and other roads (private and out-of-state).
- Ability to charge non-Washington residents.
 - Should a potential system be able to collect revenue from out-of-state drivers, which could add considerably to the cost of operation, but not very much to the revenue.



Section 3: Operational Concepts for Business Case Evaluation

We evaluated three operational concepts that represent a range of potential ways to implement road usage charging, plus combinations of concepts.

A: Time Permit	Principals buy permits to drive an unlimited number of miles for a given period (e.g., a year, a quarter, or a month).	
B: Odometer Charge	Principals estimate the number of miles they expect to drive in a year and reconcile the amounts at the end of the year.	
C: Automated Distance Charge	Principals install devices in their vehicles that record mileage and transmit usage data to an entity ⁸ that submits bills and collects revenue.	
Combinations of A, B, and C		

What are "Principals"?
Throughout the study, we have referred to the person responsible for paying a road usage charge as the "Principal," recognizing that the "driver" or "owner" of a vehicle is not always the person responsible.

⁸ For purposes of this preliminary analysis, we assume that government is the entity billing and collecting revenue, recognizing the potential for outsourcing if private entities could bid lower prices than government is able to provide.

Concept A—Time Permit: Provides unlimited miles in a given period.

- Principals would buy permits for each registered vehicle to drive an unlimited number of miles for a given period of time (such as a year, half-year, quarter, or month):
 - Permits would be purchased at the same time as vehicle registration.
 - Most permits would be for a full year, but shorter periods (month, quarter, and half-year) could be available.
 - Stickers could be issued to indicate the time for which a Principal has paid. Alternatively, this time could be stored in a database.
 - If Washington decides to charge fees on out of state vehicles, Principals could pay through kiosks at the border, sales through agents (e.g., gas stations, convenience stores), or online.
- From the State’s perspective, this is similar to the procedure that the Department of Licensing currently uses to handle vehicle registration, with additional functions for account and customer relationship management.



Concept B—Odometer Charge: A simple system that counts miles, but cannot distinguish miles driven inside or outside Washington.

- Principals would pre-pay for the amount of miles they expect to drive each registered vehicle in a given period (year, half-year, quarter, or month):
 - Stickers could be issued indicating that the Principal has paid for the given period.
 - They would self-report the number of miles actually driven at the end of the given period, and reconcile their payment.
 - Severe underestimation could result in penalties (but they can pay for additional miles to avoid penalties).
 - This is similar to how Federal income taxes are paid; taxpayers estimate their tax liabilities for the year, pay taxes in installments, and reconcile at the end of the year with their annual tax returns.
- With the odometer charge system, the tax varies directly with the amount of road use.
 - However, this system does not distinguish miles driven inside Washington from those outside Washington.
- From the State’s perspective, the accounting and customer relationship management functions would be similar and slightly more extensive than the Time Permit (Concept A).







Concept C—Automated Distance Charge: Involves an in-vehicle device that records miles differentiated by inside and outside Washington State.

- Concept C is much different from the other two in that it involves using electronic devices in people’s vehicles. The devices could:
 - Be capable of recording miles, distinguishing whether they were on Washington public roads, outside Washington, or on private roads.
 - Periodically transmit usage data to an organization that will handle billing.
 - Complement other in-vehicle services, such as pay-as-you-drive insurance, navigation, and concierge services.
- For this business case evaluation, we assumed that the government would provide the in-vehicle devices and manage accounts.
 - We made this assumption because the market for private service providers is uncertain, and we do not know the kinds of terms such providers might negotiate
 - If further evaluation finds that the private sector can carry out this function more cost effectively than government, then the business case would be better than indicated in this analysis, and the full benefit of integration of road usage charge systems with existing in-vehicle services would be realized.
- This is the most technically involved of the three concepts and would require a sophisticated accounting and customer relationship management system.
- Enforcement would be through technical certification of the entity responsible for collecting the data and odometer readings:
 - From the State’s perspective this would require extensive accounting and customer relationship management systems – considerably more extensive than for Concepts A and B:
 - Accounting and customer relationship management functions would be similar to tolling, but the scale of the undertaking would be considerably greater, since tolling only applies to a small proportion of drivers who use one of three tolled facilities in Washington.



We also considered combinations of concepts.

<p>Time Permit (A) + Odometer Charge (B)</p>	<p>The time permit is simple and non-invasive requiring a lump sum fee. The odometer charge is directly proportional to road usage.</p>	
<p>Odometer Charge (B) + Automated Distance Charge (C)</p>	<p>The odometer charge would be proportional to usage, while the automated distance charge is a technological option that is proportional to usage and can distinguish between in-state and out-of-state miles.</p>	
<p>Time Permit (A) + Automated Distance Charge (C)</p>	<p>The time permit is simple and non-invasive requiring a lump sum fee each year. Automated distance charge is proportional to usage and can distinguish between in-state and out-of-state miles.</p>	
<p>Time Permit (A) + Odometer charge (B) + Automated Distance Charge (C)</p>	<p>Offering all three concepts provides the greatest amount of consumer choice.</p>	

For more detail on the operational concepts, please reference Report 5 “Briefing Materials for Discussion at Steering Committee Meeting #7,” September 6, 2013.

The rate setting process will be established by the Legislature and Governor, but we needed to make some assumptions for the business case evaluation.

- We assumed that regardless of the tax approach selected, the road usage charge would be revenue neutral with the gas tax in terms of gross revenue in 2015, and that the rates would remain the same throughout the 2015-2040 forecast period.
- Similarly, we assumed that the current gas tax of 37.5 cents per gallon would remain the same from 2015-2040. Gas tax revenue in 2015 is forecast to be just over \$1.0 billion, to be paid by 5.812 million vehicles driving 54,150 million miles.

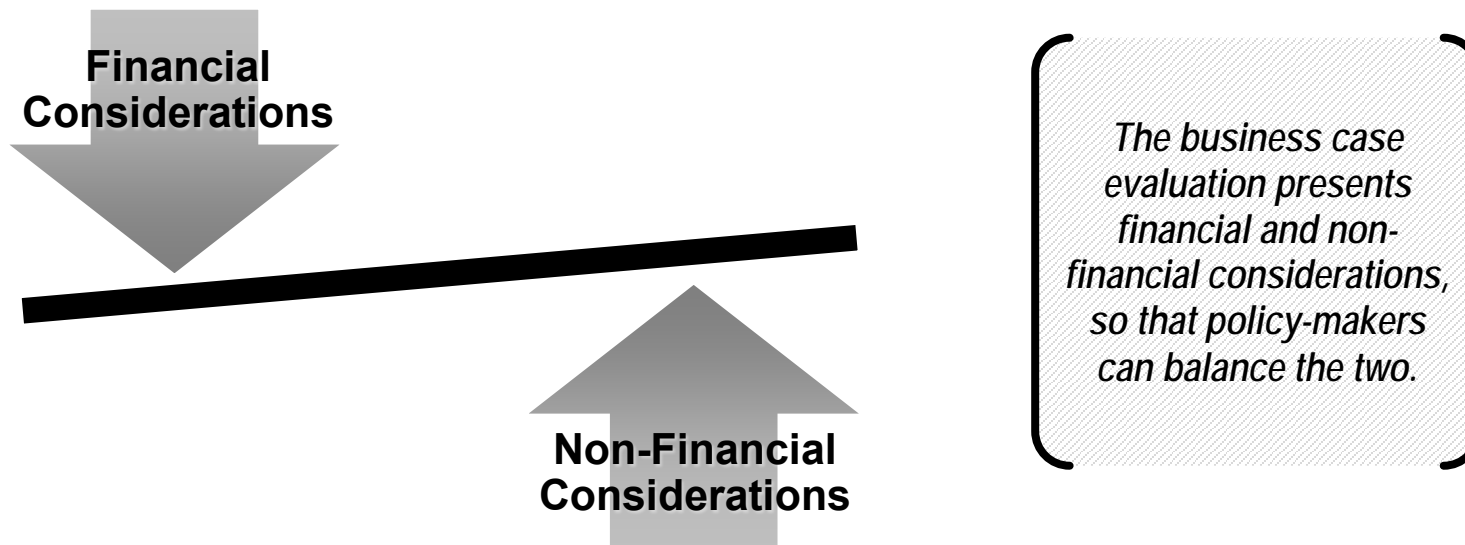
Assumed Tax Rates for Business Case Evaluation

Alternative	Rate	Unit	Basis
Existing Gas Tax	\$0.375	Gallon	Current rate.
A. Time Permit	\$172	Year	This equals the average annual Washington State gas tax forecast for 2015, which is total annual gas tax revenue divided by the number of registered non-diesel vehicles.
B: Odometer Charge	\$0.018	Mile	An amount equal to the total Washington State gas tax revenue forecast for 2015 divided by the total number of miles driven by Washington non-diesel vehicles.
C: Automated Distance Charge	\$0.018	Mile	An amount equal to the total Washington State gas tax revenue forecast for 2015 divided by the total number of miles driven by Washington non-diesel vehicles.

Section 4: Business Case Evaluation – Overview

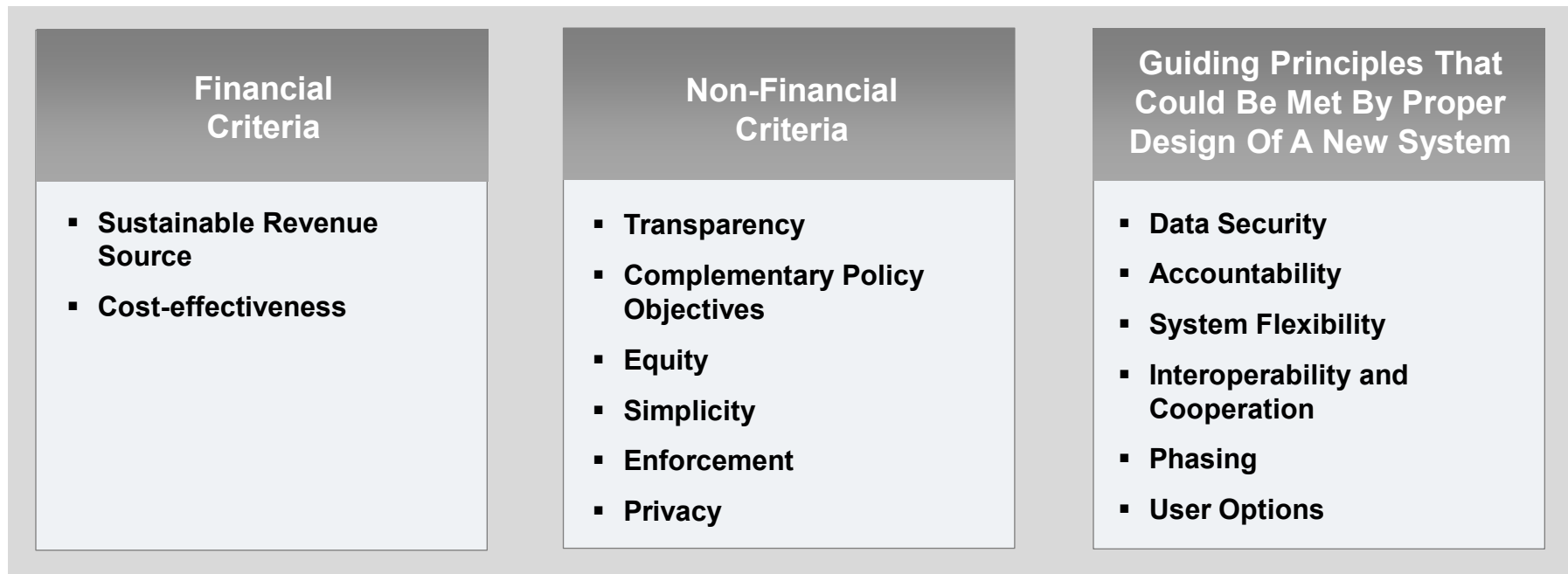
The simplified business case evaluation addressed the question: Is road usage charging worth doing?

- The business case evaluation allows decision-makers to compare alternative policy proposals (including the status-quo scenario), enabling an informed business decision.
- This simplified business case evaluation addressed both financial and non-financial objectives.



We used the goal and guiding principles articulated by the Steering Committee to define performance criteria.

- The goal and guiding principles translated into financial and non-financial criteria.
- Many of the performance criteria do not lend themselves to either financial or qualitative evaluation, but should be incorporated into any road usage charge system. These were not used in the business case evaluation to distinguish options, but were incorporated in the cost side of the analysis.
- The goal and guiding principles were used in these three ways in the business case evaluation.



“Equity” is a topic that seems simple, but quickly gets complex.

- One of the Steering Committee’s guiding principles was that “All road users should pay a fair share with a road usage charge.”
- Equity can be looked at through many lenses. We identified four components of equity that addressed this principle, and evaluated each of them (see details in Appendix B):
 - Pay for what is used;
 - Urban/rural driving;
 - Regressiveness; and
 - Border/Non-Border (to address concepts that might not distinguish out-of-state travel).
- However, it is important to remember that only looking at the distribution of who pays does not provide a full picture of equity. Other specifics of how the fee is structured, how revenue is used, and what services are provided can significantly change the equity equation.

The Transportation Research Board’s Committee on Equity Implications of Transportation Finance Mechanisms had this to say about equity:

The most important lesson from the committee's work is that broad generalizations about the fairness of HOT lanes, cordon tolls, and other evolving mechanisms oversimplify the reality and are misleading. Equity can be assessed in many ways (e.g., in terms of income or geography and across generations). Furthermore, the specifics of policy instrument design, revenue usage, and service delivery can change equity outcomes as judged by any equity criteria. Thus, the fairness of a given type of finance mechanism depends on how it is structured, what transportation alternatives are offered to users, and which aspects of equity are deemed the most important. It is impossible to draw reliable conclusions about the equity of a particular type of finance mechanism without delving into the details.

We translated the financial oriented goals and guiding principles into two performance measures.

Net Present Value of Cash Flow

- Net present value (NPV) is an accepted method of comparing cash flows over a long time horizon. It recognizes the time value of money, putting higher value on cash spent or received today than in later years.
 - NPV adds up the present value of revenue and subtracts the present value of cost over the course of the entire evaluation period.
- The time period for evaluation was 2015-2040.
- We assumed annual cost inflation of 2 percent per year based on historical averages.
- We used a discount rate of 3 percent based on published guidance from the US Office of Management and Budget.

Cost of Collection as a Percentage of Gross Revenue

- The present value of cost divided by the present value of revenue tells us what percentage of the revenue is consumed by costs.
- This is a simple indicator of cost-effectiveness.

We evaluated the non-financial criteria on a scale from zero through four stars, with comments to provide additional insights.

- The ratings are the subjective judgment of the consultant team and were employed to provide a starting point for the Steering Committee's consideration.
- We assessed how well each of the three operational concepts achieved the criteria on a standalone basis, along with commentary explaining our rationale.
- The Steering Committee identified two considerations that they did not treat as guiding principles, but were important nonetheless. We treated these considerations similarly to the non-financial criteria, but in a separate category:
 - Ability to distinguish between travel on Washington public roads and other roads (private and out-of-state).
 - Ability to charge non-Washington residents.
- Details of these evaluations are in Appendix B.

The business case evaluation started with two key assumptions.

The road usage charge would replace the gas tax in 2015, with little transition period

- Note that this assumption is neither likely nor desirable; it was made only to simplify the analysis. There are numerous ways to transition from the gas tax to a road usage charge system, and the number of permutations would overwhelm this simplified business case evaluation. Road usage charges would be set at a rate that would result in the same gross revenue in 2015 as would be generated by the gas tax.
- If there is a business case to be made for any of the alternatives, the implications of different transition approaches can be evaluated in the next phase of work, if the Legislature directs further study.

The road usage charge would apply to all vehicles that do not use diesel fuel

- The legislative directive was to transition from the gas tax, so we assumed that road usage charges would apply to all vehicles that do not use diesel fuel.
 - In other words, gasoline, gasoline hybrids, plug-in hybrids, and electric vehicles would be subject to the road usage charge. We refer to these as “non-diesel vehicles”.
 - Diesel vehicles would continue to pay the diesel tax, and would not pay a road usage charge.
- Our initial approach to only charge “cars” (i.e., light duty vehicles) and not trucks proved problematic, since approximately 25 percent of trucks use gasoline.
 - Our assumption avoids the difficulty of trying to distinguish cars from trucks at the gas pump, or creating other means of refunding gas taxes.
 - Gasoline fueled trucks represent only one percent of all gasoline vehicles.

We developed a financial model that estimates costs and revenues for a range of forecast scenarios for 2015-2040.

The forecast scenarios are based on forecasts of:

- Registrations of non-diesel vehicles.
- Gasoline consumption.
- Vehicle miles of travel (VMT).
- Fuel efficiency of non-diesel vehicles.

Important operational and economic assumptions include:

- Expected adoption rates of each operational concept.
- Account audit rates.
- Salary costs.
- Information Technology (IT) equipment costs.
- Credit card merchant fees.
- Inflation and discount rates.

Financial results are expressed as:

- Net present value of gross revenues minus capital and operating costs (including the cost of developing the systems, compliance, and enforcement).
- Cost as a percentage of revenue.
- Amount the gas tax would need to be raised to yield the same net revenue as a road usage charge concept.

Section 4a: Business Case Evaluation – Forecasts

A key element of the business case analysis involved forecasts of vehicles, vehicle miles of travel (VMT), fuel efficiency and consumption, and gas tax revenue.

- We started with forecasts provided by WSDOT and the Washington State Department of Licensing (DOL) based on data developed by the State’s Transportation Revenue Forecast Council, and refined them to identify characteristics of non-diesel vehicles only:
 - These forecasts are based on the adopted June 2013 Transportation Economic and Revenue Forecast, the most recent quarterly transportation forecast available when we conducted the analysis.⁹
 - These forecasts rely on a variety of sources, including forecasts purchased from Global Insight, a private economic forecasting firm.
 - The consultant team did further analysis to create forecasts of the vehicles, VMT, fuel efficiency and consumption, and gas tax revenue for non-diesel vehicles. Details are provided in Appendix C.
- We created alternative forecasts of future travel and demographic trends for sensitivity testing.

⁹ Quarterly Transportation Revenue Forecasts have been released subsequent to this report, but they do not meaningfully change the outcome of the business case evaluation.

Vehicle Registrations: Non-diesel registrations are expected to increase in line with historical trends, but our alternative forecast assumes fewer registrations.

State Forecast of Non-Diesel Vehicles

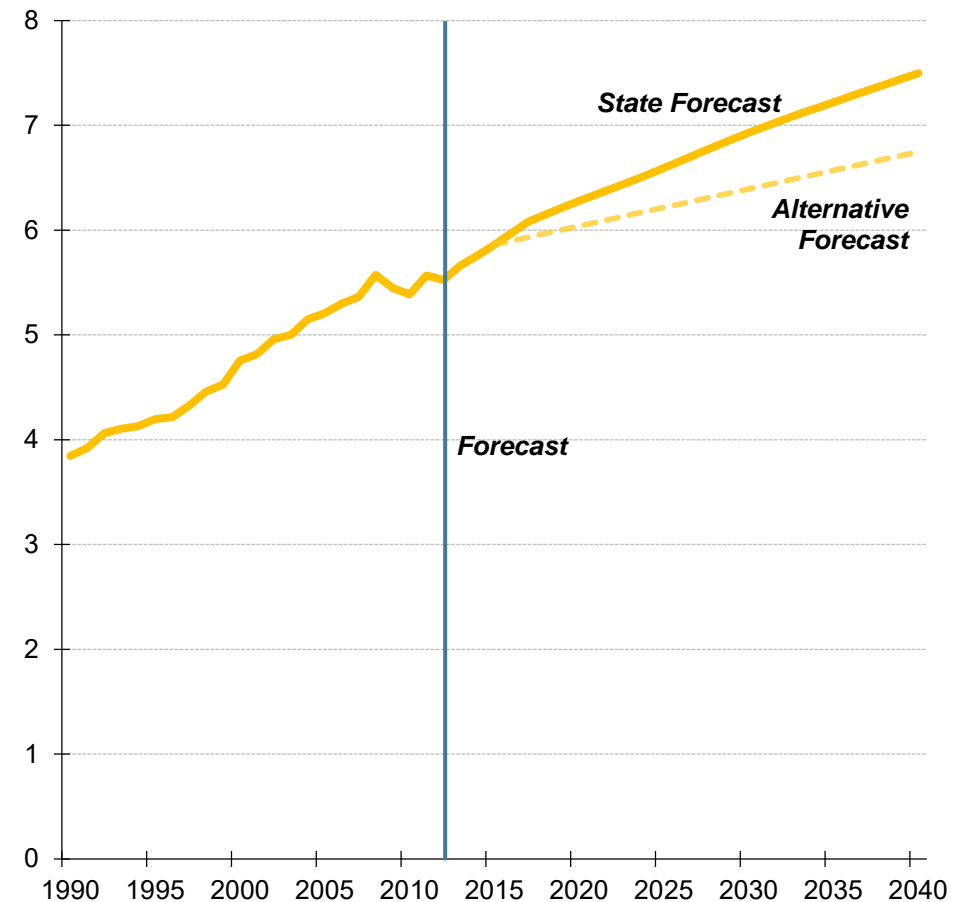
- Non-diesel vehicles climbed from 1990-2008, growing 2.1 percent per year, but fell during the Great Recession.
- The State forecasts a recovery, at lower growth rate of 1.0 percent per year from 2015-2040.

Alternative Forecast

- We prepared an alternative estimate that is 10 percent below the State forecast by 2040 (with a constant rate of change from 2015 to 2040), to capture potential variations in the growth of non-diesel vehicles.
- This lower-bound estimate, while arbitrary, is an illustrative reduction for purposes of the simplified business case analysis.

Historic and Forecast Non-Diesel Vehicle Registrations
FY 1990 to FY 2040

**Total Non-Diesel Vehicles
(Millions)**



VMT Growth: The state forecasts lower VMT growth rates than in the past for non-diesel vehicles.

State Non-Diesel VMT Forecast

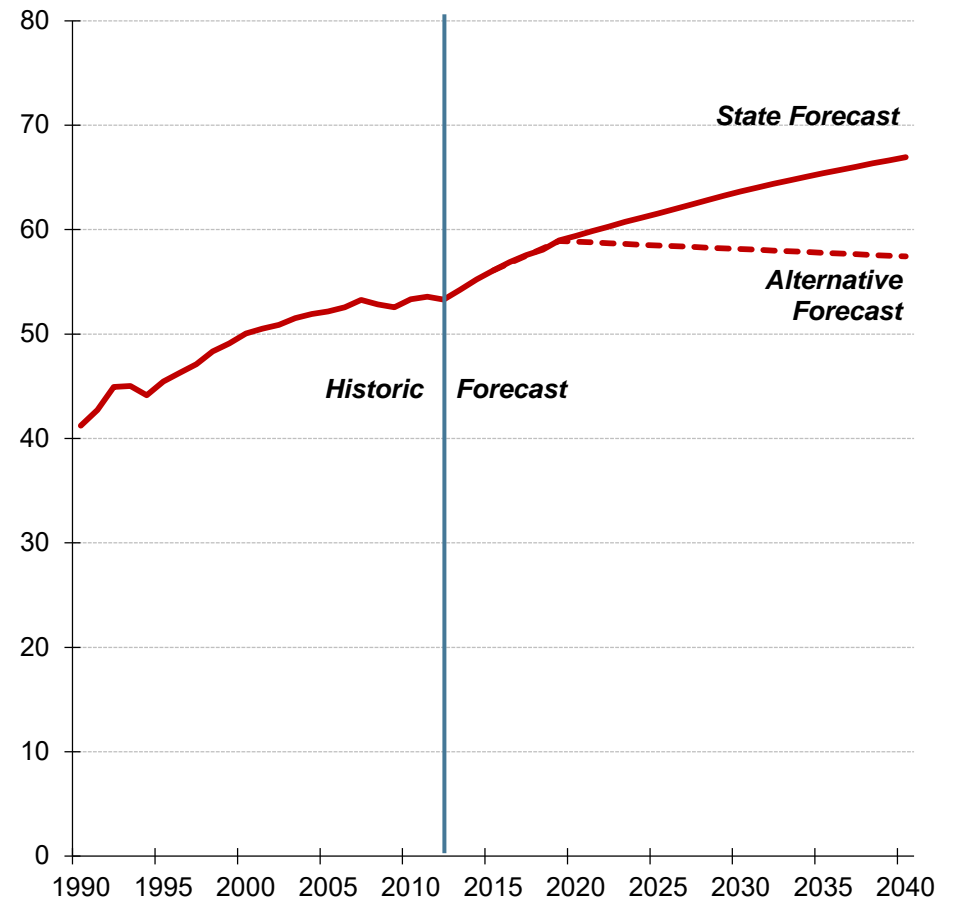
- VMT grew steadily at a rate of 1.4 percent per year from 1990 to 2008, but faltered from then to 2012.
- The State forecasts modest (0.7 percent per year) growth from 2015 to 2040.
- Slower growth of VMT in Washington is consistent with national trends.

Alternative Forecast

- The alternative forecast is based on the VMT reductions from RCW 47.01.440, passed in 2010, which requires reductions in light duty vehicle VMT per capita of 18 percent by 2020, 30 percent by 2035, and 50 percent by 2050 against a baseline value set at 75 billion VMT in 2020.
- The State forecast does not reflect these benchmarks.
- The alternative forecast shows the effect of these reductions, which dampens VMT so that it is only 2.4 percent higher in 2040 than in 2015.

Historic and Forecast VMT for Non-Diesel Vehicles
FY 1990 to FY 2040

VMT per Non-Diesel Vehicles (Billions)



Fuel Economy: The State forecasts implies modest fuel economy improvements through 2040—but other forecasts are more aggressive.

Fleet Fuel Economy and CAFE Standards

- Fleet fuel economy reflects the fuel efficiency of the entire on-road fleet in any particular year, which changes slowly.
- The 54.5 CAFE standard is somewhat misleading – it translates to an EPA sticker fuel economy of 36 mpg.¹⁰

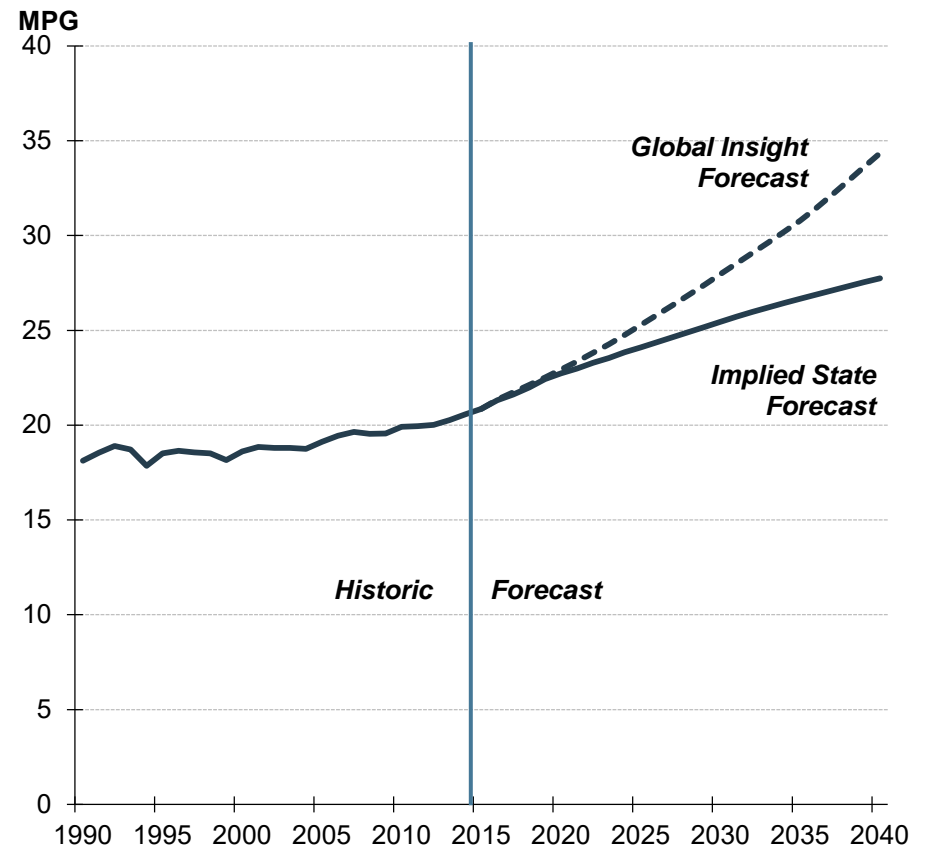
Implied State Forecast of Fuel Economy¹¹

- The implied State forecast is for on-road fuel efficiency to steadily increase from 2015 levels of 20.9 mpg to 27.7 mpg by 2040 for gasoline vehicles.

Alternative Forecast

- The Global Insight forecast of on-road fuel efficiency shows fuel efficiency improvements of 34.3 mpg by 2040, which is in line with forecasts by the U.S. Energy Information Agency (EIA).

Historic and Forecast Fuel Efficiency
FY 1990 to FY 2040



¹⁰ “The talked-about 2025 CAFE standard — usually described as 54.5 mpg — amounts to a figure of 36 mpg Combined on a window sticker.” An excellent summary of how the CAFE standards apply to real world mpg can be found at <http://www.edmunds.com/fuel-economy/faq-new-corporate-average-fuel-economy-standards.html>.

¹¹ The State provided forecasts of total VMT and fuel consumption that incorporate forecasts from Global Insight. The consulting team had to make additional assumptions to derive non-diesel VMT. When dividing the resulting non-diesel VMT by the fuel consumption, we arrived at a forecast of fuel efficiency “implied” by the estimates provided by the State.

Fuel Consumption: The State forecasts declining fuel consumption—the alternative forecast is for an even steeper decline.

State Forecast of Gasoline Consumption

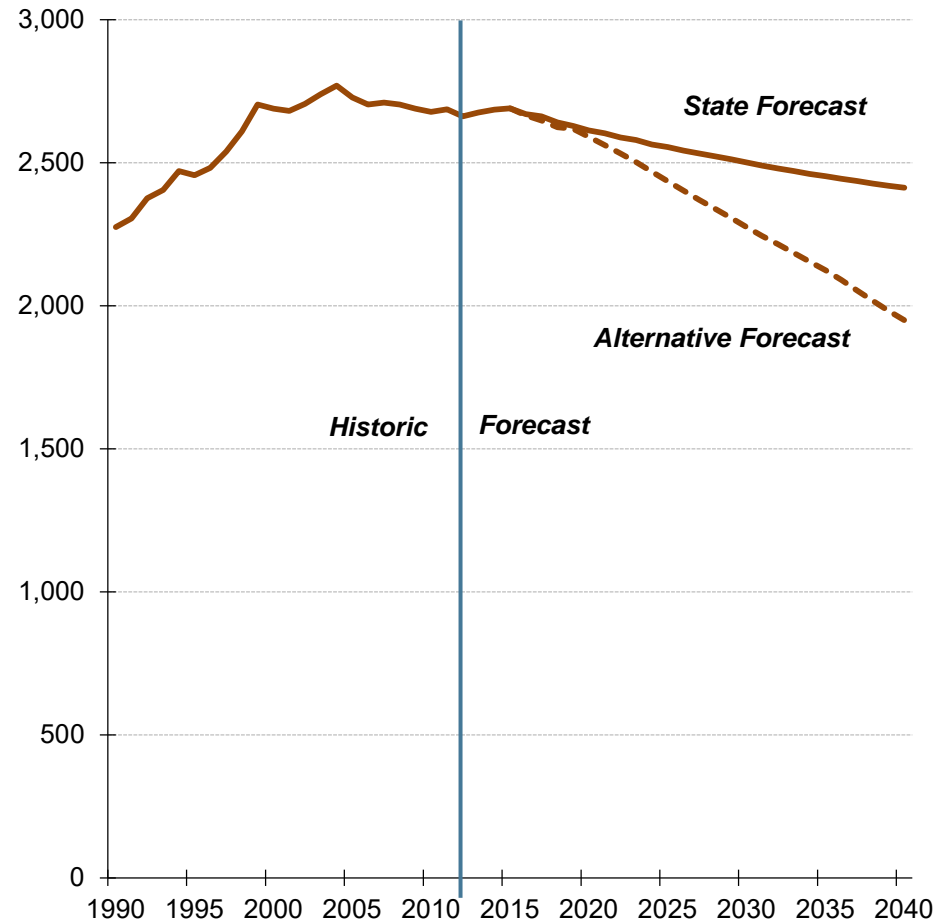
- Gasoline consumption has historically been uneven and reflects:
 - Short-term changes in economic activity;
 - Long-term changes in fleet fuel efficiency; and
 - Changes in traveler behavior (e.g., transit use).
- The State forecasts indicates that 2015 will be the last year of positive growth, with the amount consumed in 2040 being 10 percent less than that consumed in 2015.

Alternative Forecast

- The alternative forecast takes the State VMT forecast of non-diesel vehicles and divides it by fuel economy values from Global Insight. This results in an alternative forecast for gasoline consumption.

Historic and Forecast Gasoline Consumption
FY 1990 to FY 2040

Total Gas Consumption (Millions of Gallons)



Gas Tax Revenue: The State forecasts a steady decline in gas tax revenue—the alternative forecast reflects an even greater decline.

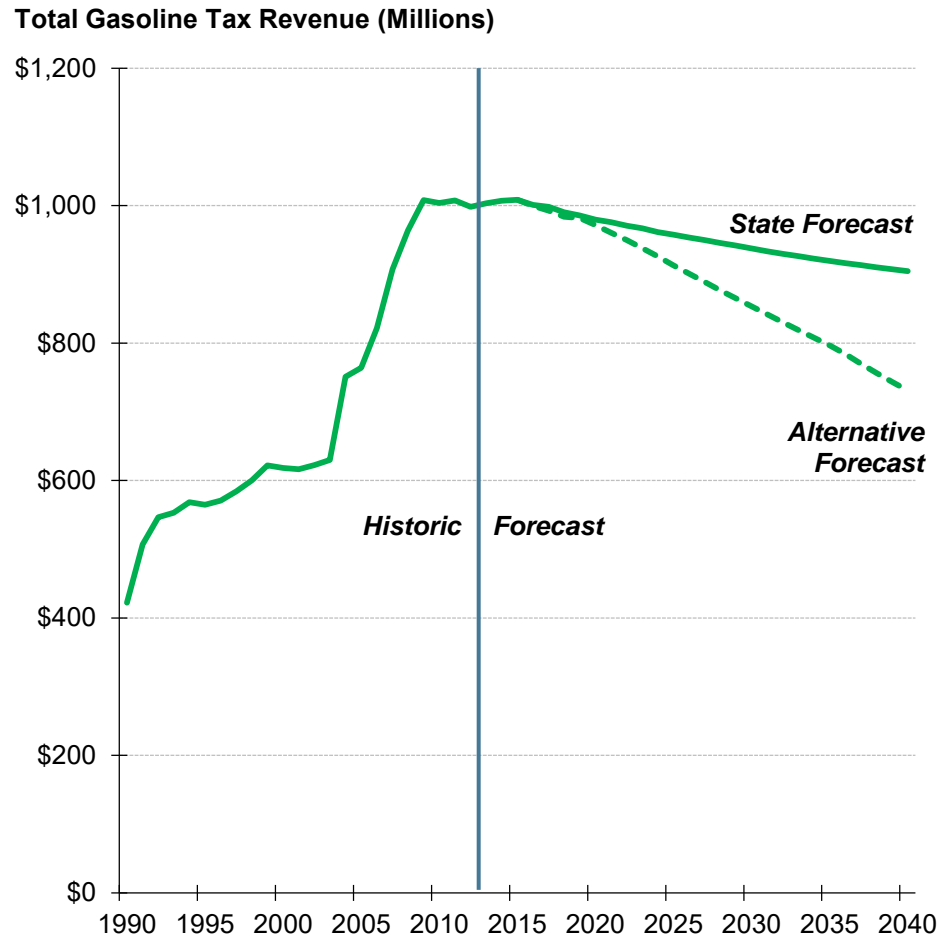
State Forecast of Gas Tax Revenue

- Gas tax revenue generally increased in the past due to VMT growth and flat fuel efficiency.
- Big increases from 2005 to 2010 are the result of two State gas tax increases (the 2003 “nickel” and 2005 Transportation Partnership program).
- The State forecasts revenue to remain flat between 2009 and 2016 before declining by approximately 10 percent by 2040, caused by slower growth in VMT and fuel economy improvements.

Alternative Forecast

- Using the Global Insight forecast for fuel efficiency results in gas tax revenue that is 28 percent lower than the State forecast by 2040.

Historic and Forecast Gas tax Revenue
FY 1990 to FY 2040



Section 4b: Business Case Evaluation – Financial and Non-Financial Evaluation

For the financial evaluation, we estimated eight categories of road usage charge costs.

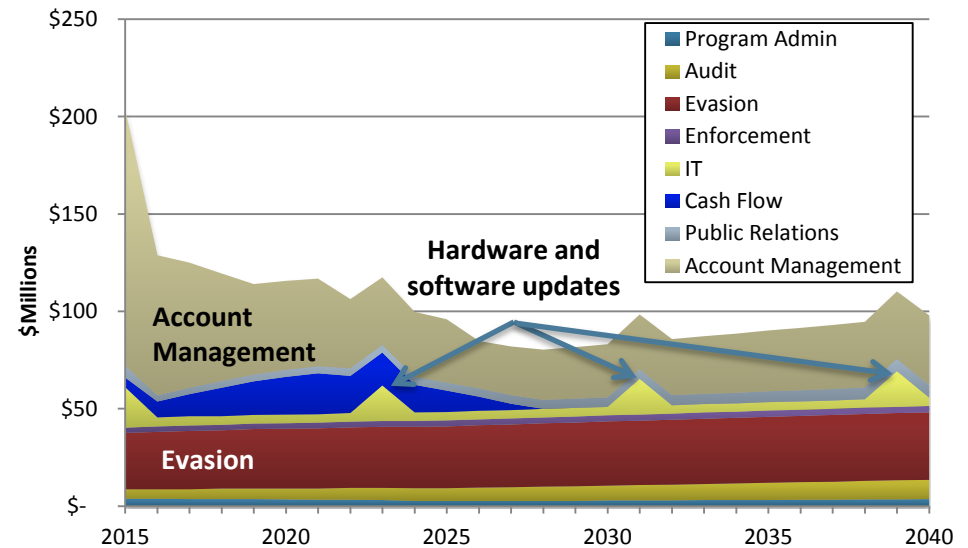
Cost Categories	
Program Administration	Management salaries and overhead.
Account Management	Cost to maintain accounts, invoice, and process payments.
Information Technology	Cost to build and maintain computer systems.
Evasion	Lost revenue due to non-payment.
Collections	The cost to recover unpaid bills.
Audit	The cost to investigate the possibility of fraud.
Public Relations	Informing the public about the road usage charge program.
Cash Flow	Short-term borrowing to make up for net revenue shortfalls compared to the gas tax in early years of operation.

Details regarding the cost categories can be found in Appendix D.

Over two-thirds of the costs for road usage charging fall into two categories: account management and evasion.

- The figure at right shows the cost to implement road usage charges from 2015-2040, for the combination of Concepts A, B, and C; the other concepts show similar trends.
- Account Management:
 - The key driver is expected to be labor to process transactions.
 - We expect these costs to decline over time as consumers opt for web-based account management and payment.
 - Account management cost might be reduced through the use of private service providers. However, there are no guarantees that private companies would be willing to handle those transactions, so we assumed that government would handle account management.
- Evasion:
 - We assume a substantial loss due to evasion because people will have to make a conscious decision to pay the charge (as opposed to the gas tax, which they pay each time they refuel).
 - Roadside enforcement and account audit processes may help reduce evasion, but the added cost of such efforts may not be worthwhile.

Estimated Annual Road Usage Charge Costs by Category: 2015-2040



While we estimate evasion for the road usage charge concepts, we do not include evasion as a cost of gas tax collection. This is one area where we do not have an "apples to apples" comparison because we do not have good data for fuels tax evasion. However, various national studies, and a study done in Washington State, indicate a fuels tax evasion rate of roughly two percent of revenue.

The cost to collect the gas tax is estimated at 0.8 percent of revenue, but this does not include the cost of evasion.

Estimates of cost to collect the gas tax

- DOL's analysis of monthly fuel tax reports to the State Treasurer and its biennial study of fees, concluded that the cost to collect the motor fuel tax in 2013 was just under \$3.2 million, or about 0.32% of gross revenues.
- Other studies around the country dating back to the 1990s have shown that motor fuel tax costs are about one percent of revenue.
- A 2011 National Cooperative Highway Research Program (NCHRP) Report titled "Costs of Alternative Revenue-Generation Systems",^a supports the estimate of about one percent. This is the most robust research to date on the cost to collect the gas tax.

Costs of evasion are difficult to come by

- Various national studies, and a study done in Washington State, indicate fuels tax evasion rate of roughly 2 percent of revenue.

^a NCHRP Report 689, "Costs of Alternative Revenue-Generation Systems," Transportation Research Board, Washington DC, 2011.

Using the State forecasts of travel characteristics, we estimate road usage charging to yield up to \$2.1 billion more than the gas tax between 2015 and 2040.

- Concept A (Time Permit) would have the biggest advantage over the gas tax: \$2.0 billion more net revenue on a discounted basis, with the cost of collection plus evasion at 6.9 percent of expected revenue.
- Concept C (Automated Distance Charge) would have a \$0.3 billion advantage over the gas tax, with the cost of collection representing 12.7 percent of expected revenue.
- The combination of Concepts A, B and C would generate \$1.9 billion more than the gas tax, with the cost of collection plus evasion at 9.7 percent of expected revenue.

Forecast Revenues and Costs of Different Concepts
Present Value from 2015-2040

VMT and Fuel Efficiency Based on State Forecast (27.7 mpg by 2040)

Concept	Revenues (\$B)	Costs + Evasion (\$B)	Net (\$B)	Net Difference from Gas Tax (\$B)	Cost + Evasion as a % of Revenue ^a
Gas Tax	\$17.1	\$0.1	\$17.0	N/A	0.4% ^b
A: Time Permit	\$20.4	\$1.4	\$19.0	\$2.0	6.9%
B: Odometer Reading	\$19.8	\$1.6	\$18.2	\$1.2	8.0%
C: Automated Distance Charge	\$19.8	\$2.5	\$17.3	\$0.3	12.7%
A+B	\$19.8	\$1.7	\$18.1	\$1.1	8.6%
A+C	\$20.1	\$2.0	\$18.1	\$1.1	9.9%
B+C	\$19.8	\$2.1	\$17.7	\$0.7	10.5%
A+B+C	\$19.8	\$1.9	\$17.9	\$1.9	9.7%

^a Gas tax value does not include evasion.

^b The reason the gas tax collection cost is 0.4% of revenue rather than the 0.3% indicated on the previous page is that gas tax revenue is forecast to decline over time, while costs will increase in line with inflation.

Using higher fuel economy forecasts, we estimate road usage charging to yield up to \$3.1 billion more than the gas tax between 2015 and 2040.

- Concept A (Time Permit) would have the biggest advantage over the gas tax: \$3.0 billion more net revenue on a discounted basis, with the cost of collection plus evasion representing 6.9 percent of revenue.
- Concept C (Automated Distance Charge) would have a \$1.4 billion advantage over the gas tax, with the cost of collection plus evasion at about 12.2 percent of revenue.
- The combination of Concepts A, B and C would generate \$1.9 billion more than the gas tax, with the cost of collection plus evasion at about 9.6 percent of expected revenue.

Forecast Revenues and Costs of Different Concepts

Present Value from 2015-2040

VMT Based on State Forecast, Fuel Efficiency Based on Global Insight Forecast (34.3 mpg by 2040)

Concept Adoption Rates	Revenues (\$B)	Costs + Evasion (\$B)	Net (\$B)	Net Difference from Gas Tax (\$B)	Cost + Evasion as a % of Revenue ^a
Gas Tax	\$16.1	\$0.1	\$16.0	N/A	0.6% ^b
A: Time Permit	\$20.4	\$1.4	\$19.0	\$3.0	6.9%
B: Odometer Reading	\$19.8	\$1.6	\$18.2	\$2.2	8.0%
C: Automated Distance Charge	\$19.8	\$2.4	\$17.4	\$1.4	12.2%
A+B	\$19.8	\$1.6	\$18.3	\$2.3	7.9%
A+C	\$20.1	\$2.0	\$18.1	\$2.1	9.7%
B+C	\$19.8	\$2.0	\$17.8	\$1.8	10.3%
A+B+C	\$19.8	\$1.9	\$17.9	\$1.9	9.6%

^a Gas tax value does not include evasion.

^b The reason the gas tax collection cost is 0.6% of revenue rather than the 0.3% indicated on the previous page is that gas tax revenue is forecast to decline over time, while costs will increase in line with inflation.

The biggest reason we expect road usage charges to have a more favorable financial outcome than gas tax is improved fuel economy – different assumptions result in considerably different outcomes.

- Average Washington fleet fuel economy is forecast to be 20.9 mpg in 2015:
 - The implied State forecast is for this to improve to 27.7 mpg by 2040.
 - Global Insight forecasts mpg to be 34.3 mpg by 2040.
 - Future fleet fuel economy is uncertain, and past forecasts have been unreliable indicators of the future.
- Federal standards call for new cars to have a corporate average fuel economy (CAFE) of 54.5 mpg by 2025, which translates to an EPA sticker fuel economy of 36 mpg.
- The difference between these fuel economy forecasts has an enormous influence on the financial outcomes.

Projecting future vehicle fuel economy is a risky business. The recent history of such endeavors makes it clear that the chances of being very wrong are very high. In the late 1970s and early 1980s, a number of studies attempted to project fuel economy levels for automobiles and light trucks through 1990. Most of the studies overestimated fleet fuel economy levels by a substantial amount. Estimates for 1990 passenger cars ranged from approximately 30 to 40 miles per gallon (mpg), but the actual fuel economy level was 28 mpg; estimates for light trucks ranged from 20 to 30 mpg, compared with the actual 20 mpg (U.S. Department of Transportation, 1991).

Automotive Fuel Economy, HOW FAR SHOULD WE GO? Committee on Fuel Economy of Automobiles and Light Trucks, Energy Engineering Board, Commission on Engineering and Technical Systems, National Research Council, NATIONAL ACADEMY PRESS, Washington, D.C., 1992

There is considerable difference in costs between the three road usage charge concepts we evaluated.

- Concepts A and B are least expensive, and therefore generate the highest net revenue. We estimate the cost of collection plus evasion as follows:
 - Concept A: about 7 percent of expected revenue;
 - Concept B: about 8 percent of expected revenue;
 - Concept C: between 12 and 13 percent of expected revenue; and
 - The combination of Concepts A, B, and C: just under 10 percent of expected revenue.
- The cost estimates for the road usage charge concepts include evasion losses and bad debt recovery costs.
- All road usage charge concepts have significant startup costs—Concept C has the most significant startup costs.
- The cost to collect the gas tax is estimated at 0.3 percent in 2013, but it does not include an estimate of evasion:
 - Evasion is the one area of our analysis where we were not able to do an “apples to apples” comparison.

It will take several years for the net revenue of the road usage charge to exceed the net revenue value of the gas tax.

- Two examples of the net cash flow comparisons:
 - It will take eight years for the present value of the most extensive road usage charge concept—the combination of Concepts A, B, and C—to exceed the gas tax in a single year (Figure 1).
 - For Concept B alone, it will take six years (Figure 2).
- Revenue declines for the road usage charge are due to discounting of future amounts, since we did not assume the tax rate to rise with inflation.
 - Revenue declines for the gas tax are also due to fuel economy improvements.

Figure 1 Annual Net Revenue of Road Usage Charge Concept Combination A, B and C Compared to Gas Tax

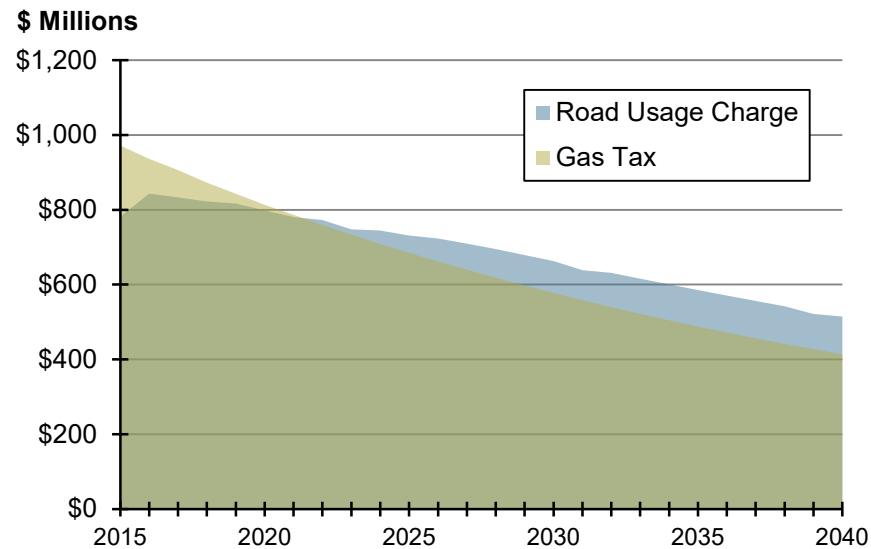
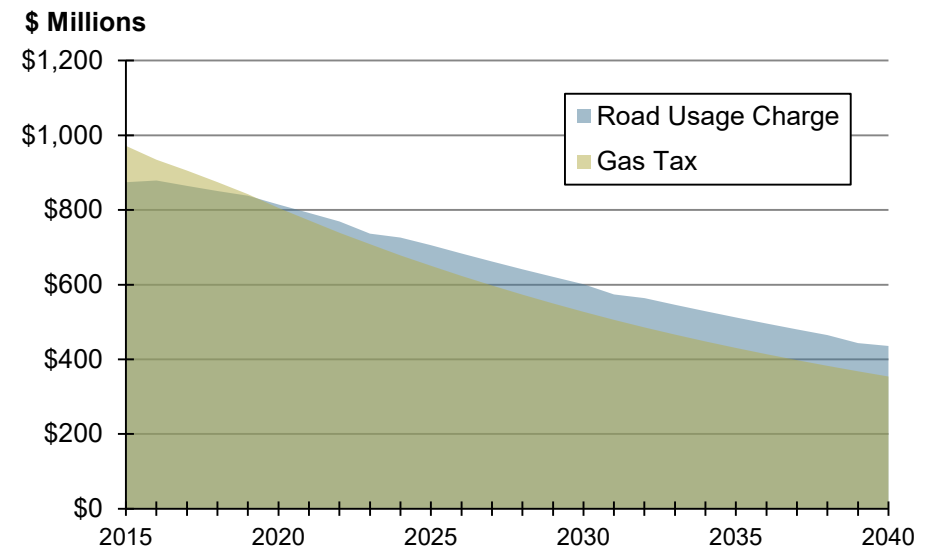


Figure 2 Annual Net Revenue of Road Usage Charge Concept B Compared to Gas Tax

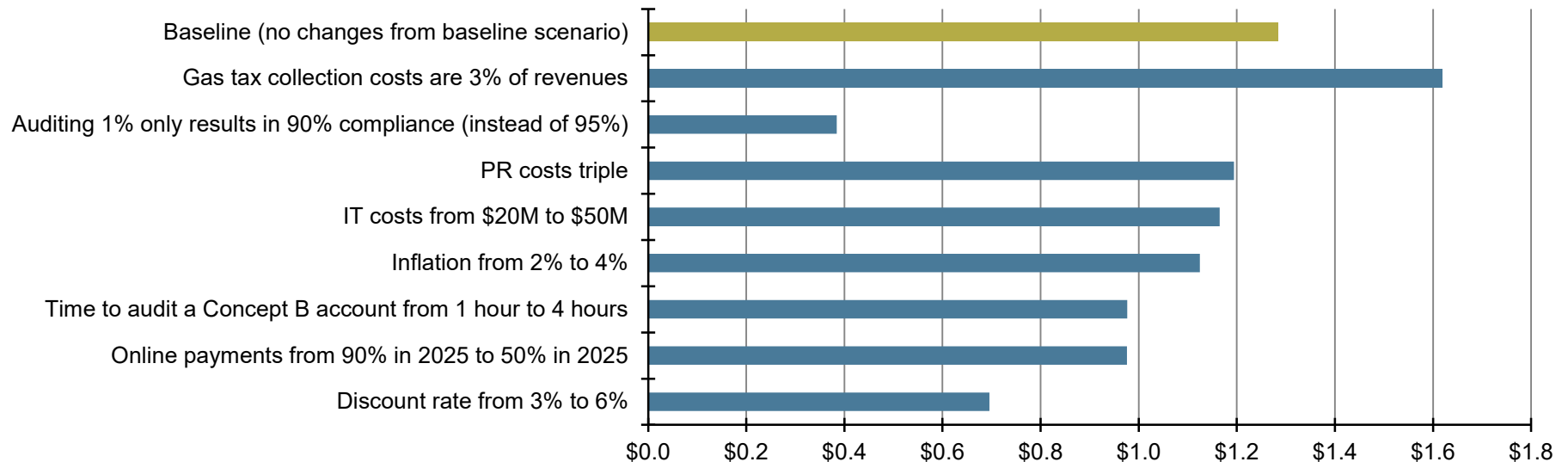


The basic findings of the financial evaluation did not change when conducted sensitivity tests of key assumptions.

- Using Concept B, Odometer Reading, as an example, we evaluated how the financial outcomes would change with a variety of different assumptions (see figure below).
- We found that none of these sensitivity tests changed the outcome that road usage charging would yield more revenue for Washington than the gas tax from 2015-2040, although in some cases the difference narrowed when we used the State forecast.
- The biggest influence came from our assumptions about compliance:
 - Our evaluation assumed 95 percent compliance. Should that drop to 90 percent the difference in net present value would be expected to drop to under \$0.4 billion (from \$1.3 billion).

Net Revenue Differences Between Gas Tax and Concept B Road Usage Charge

Sensitivity Tests



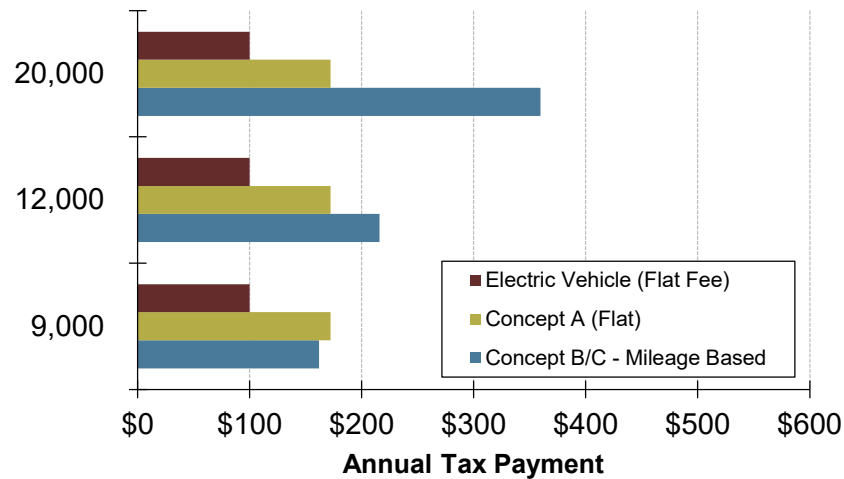
Non-Financial Evaluation: None of the concepts clearly outperforms the others when considering the non-financial evaluation criteria.

- Each has advantages and disadvantages which need to be weighed against the financial criteria (see Appendix B for details).
- Different people will view these advantages and disadvantages differently.

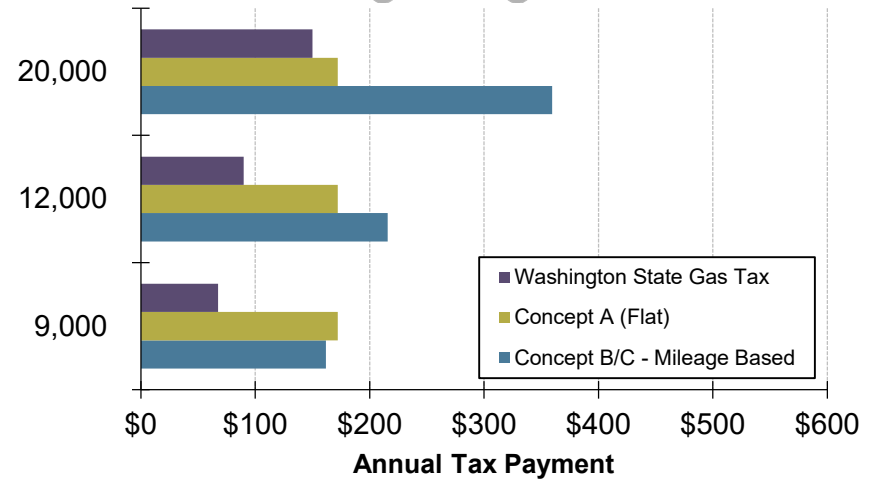
Concept	Advantages	Disadvantages
Gas Tax	<ul style="list-style-type: none"> ● Simple. ● Easy to enforce. ● No privacy issues. 	<ul style="list-style-type: none"> ● Long-term declining revenue source due to increased fuel economy and decrease in driving. ● Not transparent. People recognize it as a tax, but are not aware of the amount, payment, or use. ● Imperfect proxy for road usage in that it varies greatly according to the fuel economy of individual vehicles.
Concept A: Time Permit	<ul style="list-style-type: none"> ● Transparent. ● Relatively simple to use. ● Easy to enforce. ● No privacy issues. 	<ul style="list-style-type: none"> ● No relationship to road use.
Concept B: Odometer Charge	<ul style="list-style-type: none"> ● Transparent. ● Relatively simple to use. ● Easy to enforce. ● Privacy not a significant issue (but Principals might object to mileage reporting). ● Strong relationship to use. 	<ul style="list-style-type: none"> ● No differentiation between driving in-state, out-of-state or on private roads.
Concept C: Automated Distance Charge	<ul style="list-style-type: none"> ● Transparent. ● Strongest relationship to use, recording miles driven in-state, out-of-state, or on private roads. 	<ul style="list-style-type: none"> ● More complicated to use than others. ● Perception of privacy infringement. ● More difficult to enforce.

Illustrative Comparison of Annual Tax Payments by Vehicle Type and Annual Miles.

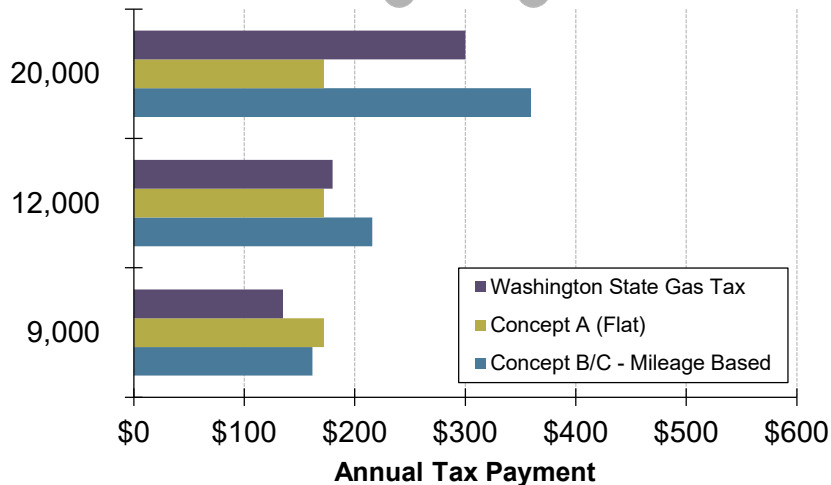
Electric Vehicle



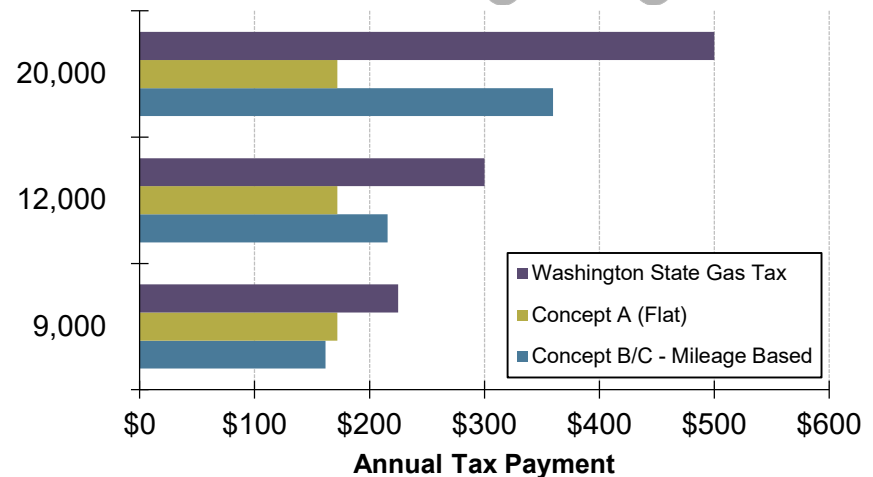
Hybrid (50 mpg)



Midsize (25 mpg)



Pickup/SUV (15 mpg)



How much gas tax increase achieves the same financial result as a road usage charge?

- We gain another perspective on the financial component of the business case by considering what gas tax increase would be needed to achieve the same financial outcome as a road usage charge.

- The answer varies widely, and depends on:

- The road usage charge concept selected for comparison (we chose the combination of A, B, and C since it had the highest cost of implementation and lowest present value of revenue).
- Fuel economy forecasts (we show both the implied State forecast and the Global Insight forecast).
- How you define “same financial result,” and how you try to achieve it—we looked at two approaches:
 - Incremental gas tax increases every five years, starting in 2022, where the gas tax increase ranged from 9.0 cents per gallon by 2040 for the implied state fuel economy forecast by 2040 of 27.7 mpg, and 20.1 cents for the Global Insight forecast of 34.3 mpg.
 - A one-time increase in 2015 to achieve the same net present value by 2040, where the gas tax increase ranged from 2.0 cents for the implied state fuel economy forecast to 4.8 cents for the Global Insight forecast.

Gas Tax Needed by 2040 to Equal Net Road Usage Charge Revenue for Concept A+B+C

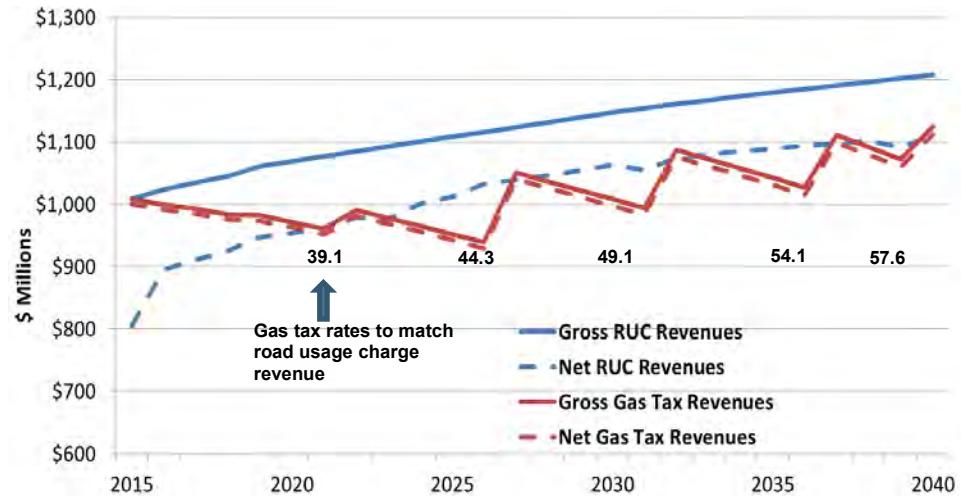
Fleet Fuel Economy Forecast by 2040	Gas tax increase (cents)	Gas tax amount (cents)
Incremental increases every 5 years, starting in 2022 – final amount of increase by 2040		
Global Insight Forecast (34.3 mpg)	20.1	57.6
Implied State Forecast (27.7 mpg)	9.0	46.5
One time increase in 2015		
Global Insight Forecast (34.3 mpg)	4.8	42.3
Implied State Forecast (27.7 mpg)	2.0	39.5

Continued...

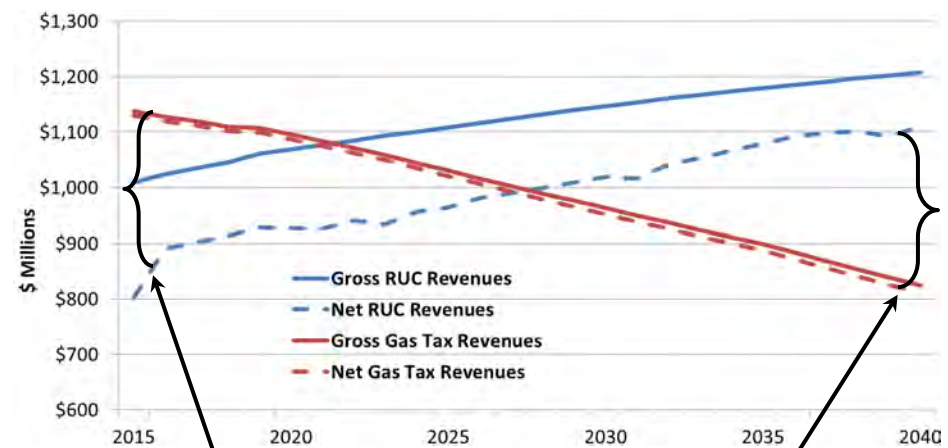
How much gas tax increase achieves the same financial result as a road usage charge? (continued)

- Cash flows for the two gas tax increase scenarios are at the right:
 - They highlight the impact of the up-front investment cost of the road usage charge.
- A relatively small gas tax increase in 2015 (4.8 cents) can yield the same net present value as the road usage charge:
 - But gas tax revenue will decline over time, requiring a large increase in 2040.
 - The cash flow would be heavily front-loaded.
- Incremental gas tax increases would achieve the same present value result as a road usage charge, but not require a big increase in 2040.
- This comparison:
 - Emphasizes the declining ability of the gas tax to generate a sustainable revenue stream without periodic increases.
 - Emphasizes the up-front investment cost of the road usage charge approach
 - Encourages an examination of the non-financial performance criteria as well.

Cash Flow Comparison-34.3 mpg with increases every five years starting in 2022



Cash Flow Comparison-34.3 mpg with a single increase of 5 cents in 2015



With a single gas tax increase, the gas tax yields considerably more than the road usage charge in the early years. These early year revenues are worth more than later year revenues on a present value basis

The gas tax would lag the road usage charge in later years. To get back on track after 2040, another increase would be needed, getting to the same level as in the sawtooth increases: 57.6 cents and 46.5 cents, depending on the fuel economy scenario

Section 5: Remaining Policy and Other Issues

Although “the business case has been made,” there are numerous issues to resolve before road usage charging can move forward in Washington.

- These issues did not affect the initial Steering Committee finding that road usage charging was feasible in Washington, nor the finding in this report that the business case has been made:
 - As a result, the Steering Committee put them in a “parking lot” – deferring research on these issues raised by the Steering Committee until a later time.
- Any of these issues could have significant bearing on important facets of a road usage charge system.
- We organized the parking lot issues into categories based on when analysis and decision-making should occur.

<i>Address in time for 2015 Legislative Session</i>		<i>Defer for now</i>
First Priority: <i>Refine Concept of Operations</i>	Second Priority: <i>Inform 2015 Legislative Session</i>	Third Priority: <i>Enable Implementation</i>
<ul style="list-style-type: none">▪ Which vehicles are subject to a road usage charge?▪ Should out-of-state drivers be charged, and how?▪ Which Principals should be exempt, if any?▪ How should we transition from the gas tax?	<ul style="list-style-type: none">▪ What are the implications for existing and upcoming gas tax bonds?▪ How should revenue be used?	<ul style="list-style-type: none">▪ How should rates be set?▪ What is the potential role of private service providers?▪ What is the extent of interoperability with other jurisdictions or systems?▪ Which agency(ies) should have responsibility, and how that new role integrate with current functions?▪ What are the legal details and ramifications?

First priority issues: refine the concept of operations.

Which Vehicles Should be Subject to a Road Usage Charge?

- Up until now, we assumed that only gasoline-powered, hybrid, and electric vehicles will pay the road usage charge—and not diesel vehicles.
- Additional analysis of the evolution of the vehicle fleet can reveal whether this is an appropriate assumption or whether alternative approaches are preferable:
 - The answer will affect both the revenues and costs of the road usage charge system as well as existing revenue mechanisms such as gasoline and diesel taxes.
 - The answer will also affect the refined concept of operations for a road usage charge system.

Should Out-of-State Drivers be Charged, and How?

- Our business case evaluation assumed that out-of-state drivers would not be required to pay the road usage charge.
- This has implications for both revenues and costs. For example, the cost of collecting from out-of-state drivers could be substantial, and may not prove to be cost-effective.
- It will also have implications for public acceptability in communities near the State border.
- Direction on this issue will help define the concept of operations.

Who Should be Exempt?

- Exemptions from payment of the gas tax include current tribal members, transit buses, and school buses.
- So far, we have not factored these exemptions into our analysis. If it is necessary to extend these refunds to a road usage charge, there will be implications for the concept of operations.

Continued...

First priority issues: refine the concept of operations (continued).

What are Various Approaches to Transition to a Road Usage Charge System, and Which Are Preferable?

- To simplify the analysis, the work to date has not accounted for transition in our policy recommendations or financial model, assuming a “big bang” start in 2015 in which all gasoline-powered vehicles begin paying a road usage charge, and the State discontinues its collection of the gas tax.
- Such a start carries significant political, programmatic, revenue, and technical risks, and it may be more desirable to gradually add drivers to the road usage charge system over a period of several years.
- However, a gradual transition would likely increase costs by operating two systems at once and other costs, such as paying out gas tax refunds or other offsets to road usage charge payers.

Second priority issues: inform the 2015 legislative session.

What are the Implications for Existing and Future Gas Tax Bonds?

- Many recently issued Washington State bonds have gas tax revenue pledges.
- We need to clarify whether additional revenue sources such as road usage charging can be used to service the bonds and, if not, whether refunding existing bonds is possible and the relevant implications (e.g., legal, financial) of doing so.

How Should Revenue Be Used?

- There seems to be a general expectation that road usage charge revenue would be used in the same way as the gas tax revenue.
- However, use of the gas tax revenue is governed by the 18th Amendment to the Washington State Constitution, which dedicates motor fuel tax collections to “highway purposes,” and by statutes that allocate funds by formula to different uses, such as counties¹² and cities and towns¹³ for roadway programs that are not part of the State highway system.
- This raises the question as to whether that restriction and allocation should continue, either in statute or in the Constitution.

¹² RCW 46.68.120.

¹³ RCW 46.68.110.

Third priority issues: to enable implementation; these issues can be deferred beyond 2015.

How Should Rates be Set?

- Our work to date assumed “gross revenue neutrality,” which is setting the rate for each operational concept based on achieving the same amount of revenue expected to be raised by the gas tax in 2015:
 - These are arbitrary rates, based on the revenues that the gas tax generates.
- Other rate policies are possible, such as:
 - Indexing for inflation; and
 - Setting the rate based on budgetary needs.
- Other related topics include:
 - Whether gas tax rates should be adjusted during a potential transition period.
 - Whether rates should reflect environmental goals, such as reducing emissions, reducing congestion, charging by vehicle weights per axle, distinguishing between rural and urban driving, or differential rates for various road types.
- The rate-setting process will be established by the Legislature and the Governor, but it would be appropriate for the Steering Committee to discuss and make a recommendation on this important, complicated, and potentially contentious topic.

Potential Role of Private Service Providers

- We assumed that a road usage charge system would be run by a state agency and the continued use of Department of Licensing subagents to handle some road usage charge transactions.
- More extensive use of private service providers, in particular related to Concept C, should be explored.

Continued...

Third priority issues: enable implementation (continued).

Extent of Interoperability with Other Jurisdictions or Systems

- Other jurisdictions are considering road usage charges, including Oregon and British Columbia.
- This presents both opportunities and constraints that need to be addressed.

Which Agencies Should Have Responsibility and Accountability and How Does a Road Usage Charge System Integrate With Current Functions?

- The simplified business case evaluation assumed that a Washington State agency would add road usage charging into its current functions:
 - Further work is needed to address the specifics of account management, road usage charge management, compliance and enforcement, and overall program authority.
- Our operational assumptions include the expectation that road usage charging will be integrated in some way with vehicle registration. There are other processes with which integration is possible in Washington, and it is even possible that a new process could be implemented to handle road usage charging.
- It may be desirable to coordinate computer system upgrades for existing agencies to coincide with implementation of road usage charging, which would impact the transition toward road usage charges and the timeline of the business case.

Continued...

Third priority issues: enable implementation (continued).

Legal Details

- Among the legal issues identified so far are:
 - Distance Measurement Instruments. Odometers, GPS systems, cell phones or other devices may or may not qualify as legal measurement instruments, unless specifically recognized as such.
 - Commerce Clause. The applicability of the Commerce Clause of the U.S. Constitution may need to be evaluated if special provisions are made to collect fees from out-of-state drivers.
 - Enforcement. The enforcement mechanisms used to monitor drivers (e.g., cameras) may need to be legally recognized.
 - Data Security. Data security standards may need to be consistent with existing regulations under the Washington State Public Records Act.

Public Outreach and Education

- Public communication prior to legislative debate will be key to get the public prepared for the switch to a road usage charge.

Section 6: Proposed Work Plan and Budget for March 2014-June 2015

The proposed work plan will address policy issues and develop a concept of operations to inform the 2015 Legislative session.

- The work plan has these objectives:
 - Address some of the “parking lot” issues that guide a specific concept of operations and to inform potential legislation.
 - Create a concept of operations for a potential road usage charge system, and for a potential pilot or phased implementation plan.
- After this work plan is completed, more work would be needed to implement a road usage charge, such as:
 - Public education and outreach;
 - Rate setting;
 - Allocation of implementation responsibility among agencies;
 - Detailed technical requirements/standards;
 - Detailed transition strategy; and
 - Pilot or market testing of implementation options.

A “concept of operations” differs from the “operational concepts” developed for the business case evaluation.

- A concept of operations provides much more detail and is sufficient to develop a system requirements document:
 - This is a key step toward a pilot or market testing of specific aspects of the system design and how it will work.
 - It will expand upon the three operational concepts described in this report: A- time permit, B- odometer charge, and C- automated distance charge
- A concept of operations is a formal systems engineering document:
 - It will define the entire operation of the road usage charging system from the perspective of the user.
 - It is a detailed technical document that follows a specified industry-accepted format.¹⁴
 - It generally contains:
 - Policy background, which will be as complete as the policy issues developed by this stage of work;
 - Statement of system goals and objectives as defined by the Steering Committee;
 - Description of system environment and constraints (e.g., external limitations to the system);
 - List of participants and stakeholders, their interactions, and stakeholder responsibilities as best as can be determined;
 - Description of system components and high-level architecture (e.g., mileage recording, accounting, user account management); and
 - Operational scenarios, including situations in which the system must operate (e.g., registering with the system, using the system (driving), canceling or changing vehicle registration).

¹⁴ We anticipate using guidelines from the Institute of Electrical and Electronics Engineers (IEEE 1362-1998).

The work plan includes the following tasks.

Task	Purpose	Description
Task 1	Refine Policy Direction Addressing High Priority Issues. Support the Legislature, the Commission, and the Steering Committee in establishing a road usage charge policy for Washington State.	<p>The following policy issues will influence the concept of operations and need to be addressed early:</p> <ul style="list-style-type: none"> ■ Which vehicles should be subjected to a road usage charge? <ul style="list-style-type: none"> ● Was our assumption that “all non-diesel vehicles should pay” a good assumption? ● What are the implications for costs? ■ Should out-of-state be drivers be charged, and if so, how? ■ Which Principals should be exempt, if any? ■ How should the State transition from the current system? <p>These policy issues are not critical for the concept of operations, but are important to resolve:</p> <ul style="list-style-type: none"> ■ What are the implications for existing and future gas tax bonds? <ul style="list-style-type: none"> ● Work with the Commission, WSDOT, and Office of the State Treasurer, with the analytical work by the Treasurer. ■ Research urban/rural equity issues <ul style="list-style-type: none"> ● Conduct surveys of urban and rural residents to understand travel patterns and characteristics that will influence how much different types of users will pay for different systems

Task	Purpose	Description
Task 2	Develop a Concept of Operations. Define how system users will experience the system when driving and paying charges.	<ul style="list-style-type: none"> ■ Develop a single concept of operations that combines Concepts A+B+C¹⁵ that reflects the policy recommendations from Task 1. <ul style="list-style-type: none"> ● Develop as if for a complete system, and then potentially create a limited version for use in a pilot. ● Consider, at a very high level, potential transition approaches (with further detail deferred to later phases).
Task 3	Risk Analysis. Identify risks and potential mitigation measures to minimize adverse impacts and the costs of such impacts.	<ul style="list-style-type: none"> ■ Conduct workshops with State agencies: <ul style="list-style-type: none"> ● Develop an inventory of technical, operational, cost, communications, legal, and policy risks and threats to the development and implementation of a road usage charge. ● Identify mitigation measures to alleviate uncertainty in the execution of the system. ● Identify potential costs of risks
Task 4	Financial Evaluation.	<ul style="list-style-type: none"> ■ Build upon the existing business case model to incorporate more detailed cost and revenue data based on decisions taken in Tasks 1, 2, and 3, including: <ul style="list-style-type: none"> ● Initial recommendations on transition; and ● Updated information on the costs of gas and diesel tax collection (if possible). ● Risk mitigation measures

¹⁵ A- time permit, B- odometer charge, and C- automated distance charge

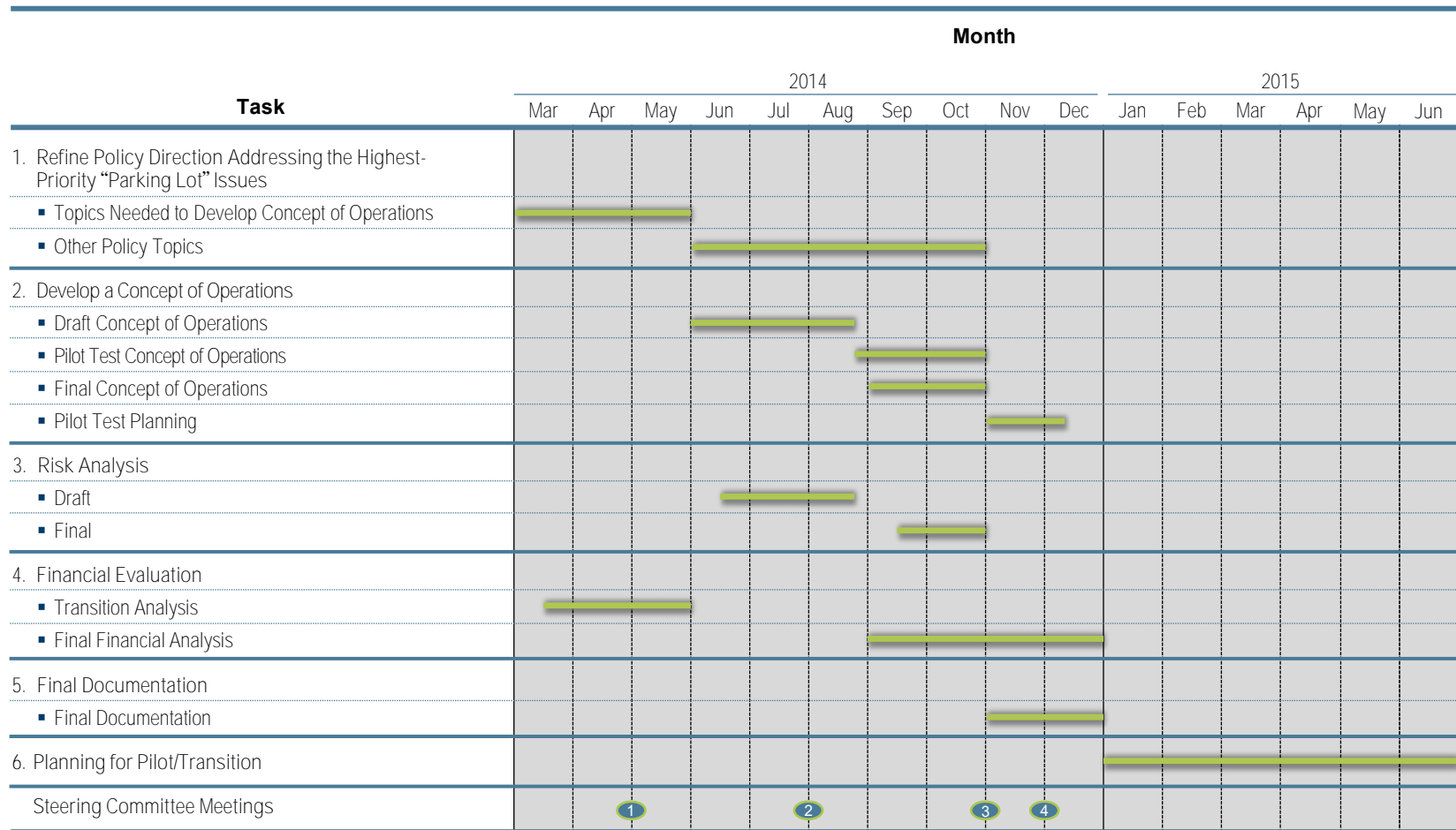
Task	Purpose	Description
Task 5	Final Documentation.	■ Produce a final report and presentations.
Task 6	Planning for Pilot/Transition	Potential efforts could include working with staff to develop grant proposals for federal pilot programs, focus groups to vet the concept of operations, or further planning for pilot tests or market tests, and initiating transition planning.

The work plan assumes four Steering Committee meetings, Legislative and Governor briefings, and coordination with government agencies such as Department of Licensing, Department of Revenue, Department of Transportation, and Office of the State Treasurer.

We plan to work through 2014 to develop recommendations in time for the 2015 legislative session.

- Assuming the work starts in March 2014, recommendations and final documentation will be done by late Fall 2014. Work can continue on pilot test/transition planning in early-mid 2015.

Road Usage Charge Schedule



Estimated Budget.

- We developed a budget based on the expected level of effort needed to be done for each of the above tasks, with estimates for the amount needed for the remainder of FY 2014 (through June 2014) and for FY 2015 (July 2014-June 2015).
- The total budget estimate is \$869,000, with \$321,000 for the remainder of FY 2014 and \$548,000 for FY 2015.

Task	March 2014- June 2014	July 2014- June 2015	Total
1. Refine Policy	\$114,500	\$ 69,400	\$183,900
2. Concept of Operations	81,600	81,600	163,200
3. Risk Analysis	–	105,600	105,600
4. Financial Evaluation	85,100	120,100	205,200
5. Final Documentation	39,800	60,700	100,500
6. Planning for Pilot /Transition	–	105,600	110,600
Total	\$321,000	\$548,000	\$869,000

Appendices

Provided on CD for printed versions, and for download on the Steering Committee's web site:
<http://waroadusagecharge.wordpress.com/>.

[Appendix A: Business Case Evaluation Financial Analysis Assumptions](#)

[Appendix B: Business Case Evaluation Non-financial Analysis](#)

[Appendix C: Forecast Details](#)

[Appendix D: Road Usage Charge Administration Cost Categories](#)





**Washington State
Transportation Commission**



**Washington State
Department of Transportation**

CAMBRIDGE
SYSTEMATICS

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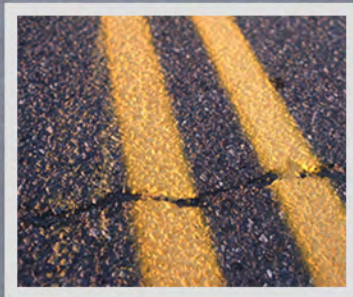
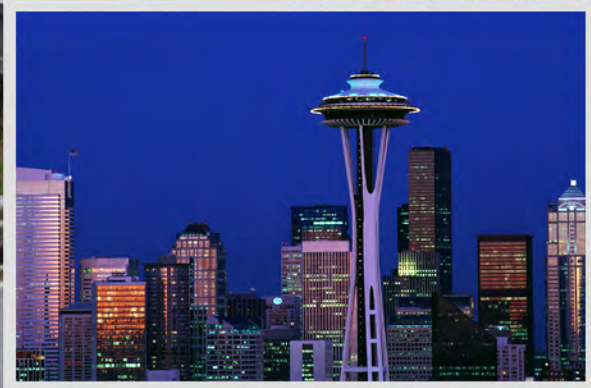


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CONSULTING



Business Case Evaluation: APPENDICES

Prepared for:
Governor Jay Inslee
and
Washington State Legislature



January 7, 2014



Washington State
Transportation Commission



Washington State
Department of Transportation

CAMBRIDGE
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Appendix A: Business Case Evaluation Financial Analysis Assumptions

Summary of Quantitative Assumptions

Key assumptions that determine the costs associated with road usage charge administration and collection are shown here.

Business Case Model Inputs

Category (Units)	Value	Source
Inflation based on 2013 CPI (percent per year)	2.0%	http://www.bls.gov/news.release/pdf/cpi.pdf
30-year nominal discount rate (percent per year)	3.0%	http://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-04.pdf
Device communications paid by state (percent of total cost)	50%	Assumption
Cost to purchase in-vehicle device for Concept C	\$40	Industry estimate
Average time to conduct an audit (person-hours) – A	0	Assumption
Average time to conduct an audit (person-hours) – B	1	Assumption
Average time to conduct an audit (person-hours) – C	2	Assumption
Average time to conduct an audit (person-hours) – C (private service provider)	2	Assumption
Percent of nonpayment/underpayment recovered by collections	37%	GAO: http://www.gao.gov/assets/280/276666.pdf
Collections cost for slow pay/bad debt	16%	GAO: http://www.gao.gov/assets/280/276666.pdf
Credit card merchant fee – flat	\$0.10	Visa

Category (Units)	Value	Source
Debit card merchant fee – flat	\$0.10	Visa
Electronic funds transfer flat fee	\$0.10	Assumption
Credit card merchant fee – percent	2.70%	Visa
Debit card merchant fee – percent	1.10%	Visa
EFT percent fee	0.00%	Assumption
IT equipment acquisition (if new)	\$20,000,000	Industry estimate
IT equipment acquisition (if integrated)	\$15,000,000	Industry estimate
IT software acquisition	\$5,000,000	Industry estimate
Software licenses (annual cost)	\$1,000,000	Industry estimate
Online payments by 2025	90%	Assumption
Hours per full-time employee	2000	Assumption
Staff per manager, audit division	10	Assumption
Staff per manager, account management division	20	Assumption
Managers per office assistant	3	Assumption
Manager salaries	\$100,000	Assumption
Program manager salary	\$150,000	Assumption

Category (Units)	Value	Source
IT maintenance per year as a percent of capital costs	10%	Industry estimate
IT major maintenance as a percent of capital costs	70%	Industry estimate
Frequency of major maintenance	8 years	Industry estimate
Audit materials cost per audit	\$10.00	Assumption
Burden rate	1.7	Comparative value of overhead from Oregon
Outreach/education per new account	\$1.00	Assumption
Outreach/education per existing account	\$0.50	Assumption
Mileage reporting device equipment failure rate	5 per thousand	Industry estimate
Percent miles out-of-state and off-road by Concept C accounts	2.0%	Assumption

Payment

Payment Location	<p>Upon initial implementation, it is assumed that payments associated with Concepts A and B are made 30 percent online, 35 percent in person, and 35 percent via mail, reflecting the approximate split for DOL registration renewal currently.</p> <p>Concept C begins at 60 percent online, reflecting the fact that approximately that proportion of U.S. adults owns smartphones. 20 percent pay in person and 20 percent via mail.</p> <p>Online payment is assumed to grow to 90 percent by 2025 and remains constant thereafter, to reflect the fact that online payment is still growing, but that a small percentage of people will prefer to pay in a way that does not involve electronic means. This percentage includes “unbanked” people who do not qualify for a bank account (estimated at 3.8 percent in Washington State by the FDIC). The remainder are by mail and in person.</p>
Payment Frequency	65 percent pay annually, with 15 percent semiannually and 20 percent opting for quarterly payments.
Payment Method	<p>Among those paying online, payments are divided equally between credit cards, debit cards, and bank transfers (EFT).</p> <p>Among those paying in person, 50 percent pay via check, 25 percent via debit card, 12.5 percent credit card, and 12.5 percent cash.</p> <p>All mail payments are via check (or money order).</p>

Labor

We assume that account management, auditing, and IT maintenance and operation are performed by Washington State employees. The salaries (cost of time) of these employees are based on the Washington State Human Resources schedule of salaries. The total cost to the program is computed by multiplying their salaries times a burden rate, currently set at 1.7, to reflect additional cost of benefits, insurance, and other workplace overhead.

We used the labor categories in the following table and the average salary within each category.

We assumed no involvement by private service providers for account management; all costs reflect the cost for a state agency to operate a road usage charging system. Service providers would only become involved if their participation could reduce the cost below the levels achieved by the State of Washington.

Function	Labor Category
Account Management	Financial Services Specialist – Level 5
Audit	Audit Specialist – DOT – Level 4
IT	IT Specialist 1

Financial

Audit rates will vary by scenario, and are likely to impact compliance rates. We assumed that Concept A, which has no mileage recording, would have zero audits, and that Concepts B and C would audit 1.0 percent of accounts each year. At these rates, we assumed 5 percent of users will attempt to evade the system:

- We treated the cost of collection as 16 percent of the amount collected, based on rates for state collection agents in other states.
- “Outreach/education per new account” contains the average cost of educating the owner of a new account (paper mailing) as well as more modest costs associated with communications for existing customers.
- Neither the road usage charge rate nor the gas tax is tracked to inflation and remains the same from 2015 onward.

Economic

- Inflation rate of 2 percent, based on historical averages.
- Nominal discount rate of 3 percent, consistent with OMB Circular 94. This represents the nominal interest rate on treasury notes and government bonds.
- Under any road usage charging scenario, we assume there is no collection of gas taxes, but DOL continues to collect diesel taxes from all diesel vehicles. Diesel vehicles pay a diesel tax, not a road usage charge.
- 2 percent of miles are driven out-of-state. Any Principal selecting Concept C do not pay road usage charge on miles driven out-of-state, but those choosing Concept B pay road usage charge for every mile driven regardless of location.

Appendix B: Business Case Evaluation Non-financial Analysis

Overview of Qualitative Evaluation

We rated each alternative, including the gas tax, across the qualitative performance criteria described in Section 4 using a scale from zero to four stars, as shown in Table 8.

Table B.1 Qualitative Evaluation Rating Criteria

Criteria	Rating
Completely Satisfies Criteria	★ ★ ★ ★
Mostly Satisfies Criteria	★ ★ ★
Moderately Satisfies Criteria	★ ★
Minimally Satisfies Criteria	★
Does Not Satisfy Criteria	○

Note that the ratings are the subjective judgment of the consultant team and are included simply to provide a starting point for the Steering Committee's consideration.

We provide an assessment of how well each of the three operational concepts on a standalone basis achieves each of the criteria, along with commentary explaining our rationale. We then repeated the exercise for each of the combinations of concepts.

Summary of Qualitative Assessment Findings

A summary of the assessment is shown in Table 9. A summary of the qualitative evaluation of both the stand alone concepts as well as the combination concepts are provided in the following pages, followed by the details that led to these ratings. Note that while we have several categories of equity in the detailed assessment, we avoided highlighting these in this summary because equity issues are difficult to assess without considering a lot of the implementation details that have not been decided yet. Also, equity concerns can be mitigated through fine tuning these details.

Table B.2 Summary Evaluation

Concept	Advantages	Disadvantages
Gas Tax	<ul style="list-style-type: none"> ■ Simple ■ Easy to enforce ■ No privacy issues 	<ul style="list-style-type: none"> ■ People are unaware of the tax and how much they pay (not transparent) ■ Imperfect proxy for road usage in that it varies greatly according to the fuel economy of individual vehicles.
Concept A: Time Permit	<ul style="list-style-type: none"> ■ Transparent ■ Relatively simple ■ Easy to enforce ■ No privacy issues 	<ul style="list-style-type: none"> ■ No relationship to use

Concept	Advantages	Disadvantages
Concept B: Odometer Charge	<ul style="list-style-type: none">■ Transparent■ Relatively simple■ Easy to enforce■ Privacy not a significant issue (but some might object to mileage reporting)■ Strong relationship to use	<ul style="list-style-type: none">■ Border residents that travel out of state or drive on private land may pay for many miles driven out of state or off public roads
Concept C: Differentiated Distance Charge	<ul style="list-style-type: none">■ Transparent■ Strongest relationship to use, capturing in-state versus out-of-state travel	<ul style="list-style-type: none">■ Less simple than others■ Perception of privacy infringement■ Less easy to enforce

Summary of Qualitative Evaluation of Stand Alone Concepts

Table B.3 Summary Evaluation of Concepts

	Gas Tax	A: Time Permit	B: Odometer Charge	C: Differentiated Distance Charge
Transparency	⊙	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★
Complementary Policy Objectives	★ ★	★	★ ★	★ ★
Equity: <i>Pay for what you use</i>	★	★	★ ★ ★	★ ★ ★ ★
Equity: <i>Urban/ rural</i>	★ ★ ★	★ ★ ★ ★	★ ★ ★	★ ★ ★
Equity: <i>Regressiveness</i>	★ ★	★	★ ★	★ ★
Equity: <i>Border/Non-Border</i>	★ ★ ★	★ ★ ★	★	★ ★ ★ ★
Simplicity	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★
Enforcement	★ ★ ★	★ ★ ★ ★	★ ★ ★	★ ★
Privacy (perception)	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	★ ★
Total ¹	21	24	24	25

¹ These totals provide an interesting way to quickly size up an option; however, individual ratings have not been weighted by importance from the Steering Committee, so they could give a misleading view of performance.

Other Important Factors Summary

Table B.4 Summary of Important Factors

Factor/Rating	Gas Tax	A: Time Permit	B: Odometer Charge	C: Differentiated Distance Charge
Ability to distinguish between travel on Washington public roads and private roads.	★	⊙	⊙	★ ★ ★ ★
Ability to charge non-Washington residents.	★ ★ ★	★ ★ ★	⊙	★ ★
Total	4	3	0	6

Summary Evaluation of Combination Concepts









Table B.5 Summary Evaluation of Concepts

	1: A (Time Permit) + B (Odometer Charge)	2: A (Time Permit) + C (Differentiated Distance Charge)	3: B (Odometer Charge) + C (Differentiated Distance Charge)	4: A (Time Permit) + B (Odometer Charge) + C (Differentiated Distance Charge)
Transparency	★★★★	★★★★	★★★★	★★★★
Complementary Policy Objectives	★★★	★★	★★	★★
Equity: <i>Pay for what you use</i>	★★★	★★★	★★★	★★★★
Equity: <i>Urban/rural</i>	★★★	★★★	★★★	★★★
Equity: <i>Regressiveness</i>	★★	★★★	★★	★★
Equity: <i>Border/Non-Border</i>	★	★★★	★★	★★★★
Simplicity	★★★	★★★	★★	★★
Enforcement	★★★	★★	★★	★★
Privacy (perception)	★★★	★★★	★★	★★★
Total ²	24	26	22	24

² These totals provide an interesting way to quickly size up an option; however, individual ratings have not been weighted by importance from the Steering Committee, so they could give a misleading view of performance.






Other Important Factors Summary

Table B.6 Summary of Important Factors

Factor/Rating	1: A (Time Permit) + B (Odometer Charge)	2: A (Time Permit) + C (Differentiated Distance Charge)	3: B (Odometer Charge) + C (Differentiated Distance Charge)	4: A (Time Permit) + B (Odometer Charge) + C (Differentiated Distance Charge)
Ability to distinguish between travel on Washington public roads and private roads.				
Ability to charge non-Washington residents.				
Total	3	7	2	6

Gas Tax – Detailed Evaluation

Table B.7 Gas Tax Evaluation

Performance Criterion/Rating	Analysis
Transparency 	The gas tax is paid at the wholesale terminal rack, and then rolled in to the retail price of fuel. Drivers are generally not aware of the amount of tax they pay, unless they pay attention to news reports when new taxes are proposed. Gas pumps do not typically show the amount of tax paid in a particular transaction (unlike other taxes, such as sales tax). Requiring that the tax be shown on the pump and on receipts could increase transparency.
Complementary Policy Objectives 	The gas tax is correlated with energy reduction and emissions goals, since cars that burn more fuel pay more. So “gas guzzlers” pay more than more efficient vehicles, providing some price incentive to switch to a more fuel efficient vehicle. It is only somewhat correlated with congestion management goals in that cars with high fuel efficiency do not pay as much as less efficient cars, and will not get the same level of price signal regarding additional driving. As cars become more fuel efficient, the connection will become less.
Equity: <i>Pay for what you use</i> 	People that drive more pay more, but the connection varies according to fuel efficiency. Cars that do not use gasoline (or diesel) pay no gas tax (except for the recently enacted per-vehicle charge). ³
Equity: <i>Urban/rural</i> 	People that drive more pay more, but the connection varies according to fuel efficiency. Cars that do not use gasoline (or diesel) pay no gas tax (except for the recently enacted per-vehicle charge). According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city. ⁴ Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Typically, they drive less fuel efficient vehicles and therefore they also pay more per mile than urban drivers. We have supporting data from Oregon, but we do not have Washington State data to support this.
Equity: <i>Regressiveness</i> 	People of lower incomes will typically pay a greater percent of their income on the gas tax than more wealthy people. To the extent that people of lower income also drive older, less fuel efficient cars, they will pay more than someone who can afford the more expensive electric, plug-in hybrid vehicles. This gap will likely widen over time.

³ In 2013, Washington State enacted a \$100 per vehicle charge for electric vehicles, in lieu of electric vehicles paying gas tax.

⁴ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Equity: Border/Non-Border ★ ★ ★	There is no significant difference in taxes paid between people on the Washington State border and those that are not. People near the borders of Oregon and Idaho can take advantage of lower tax rates in those states. People from British Columbia, Canada, drive across the international border to purchase less expensive fuel in Washington State (savings are approximately U.S. \$2.00 per gallon)
Simplicity ★ ★ ★ ★	The system is so simple that it goes largely unnoticed by the Principal. Collection is from a small number of distributors.
Enforcement ★ ★ ★	Collection is from a small number of distributors, easing enforcement, but there is a fair amount of evasion that is not enforced.
Privacy (perception) ★ ★ ★ ★	No travel activity is recorded.

Other Important Factors Related to the Gas Tax

Table B.8 Gas Tax – Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. ★	There is no way to distinguish travel between Washington public roads and other roads. However, people that spend a lot of time out of state are likely to purchase fuel in other states more often.
Ability to charge non-Washington residents. ★ ★ ★	Non-Washington residents that purchase gas in the state pay the gas tax.



Concept A: Time Permit – Detailed Evaluation

Table B.9 Concept A Evaluation

Performance Criterion/Rating	Analysis
Transparency ★★★★	Principals would pay a special tax bill related to road usage.
Complementary Policy Objectives ★	With no “pay per use” feature, the only contribution to complementary policy objectives lies in the increased transparency of the fee.
Equity: <i>Pay for what you use</i> ★	Everyone pays the same regardless of road usage.
Equity: <i>Urban/rural</i> ★★★★	All vehicles would pay the same amount, regardless of type of community.
Equity: <i>Regressiveness</i> ★	People of lower incomes will certainly pay a greater percent of their income than more wealthy people, since everyone pays the same rate. This could be mitigated with need-based rates.
Equity: <i>Border/Non-Border</i> ★★★	Everyone would pay the same price, so people on the border would pay the same as people in the interior of the state. Some border-region residents might pay proportionately more in Washington if they drive most of their miles out of state.
Simplicity ★★★	The system is relatively simple in that it can be combined with the registration fee and there is no need to count miles. It does involve slightly more work for Principals than the gas tax.
Enforcement ★★★★	Enforcement is identical to and can be combined with existing registration enforcement.
Privacy (perception) ★★★★	No travel activity is recorded.

Other Important Factors Related to Concept A: Time Permit

Table B.10 Concept A Important Factors



Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. 	There is no way to distinguish travel between Washington public roads and other roads.
Ability to charge non-Washington residents. 	Since there is no ongoing need for data related to actual travel, this is the simplest of the three concepts to adapt for out-of-state travelers.

Concept B: Odometer Charge – Detailed Evaluation

Table B.11 Concept B Evaluation



Performance Criterion/Rating	Analysis
Transparency ★★★★	Principals would pay a special tax bill directly related to road usage.
Complementary Policy Objectives ★★	Drivers that drive more, pay more, so there is some correlation to efforts to reduce congestion, energy use, and emissions. However, there is no distinction between vehicles with high and low fuel efficiency, potentially at odds with Washington’s goals to reduce energy use and greenhouse gas emissions. To address this issue, charges could vary by energy or emissions category, thereby increasing this rating, but this would change other aspects of this evaluation.
Equity: <i>Pay for what you use</i> ★★★	People pay for each mile they drive (but they also pay for miles outside of Washington).
Equity: <i>Urban/rural</i> ★★★	People that drive more pay more. According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city. ⁵ Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Further cost differences from the gas tax approach caused by different fuel economy would be eliminated.
Equity: <i>Regressiveness</i> ★★	People of lower incomes will pay a greater percent of their income than more wealthy people. This could be mitigated with need-based rates.
Equity: <i>Border/Non-Border</i> ★	Since people will pay the same price for all miles, people near the border that frequently travel out of state will pay for more non-Washington miles. However, they may be no worse off than they are now, when they pay gas tax regardless of where they drive. Border residents will not necessarily be worse off than non-border residents from that perspective.
Simplicity ★★★	The system is less simple than the time permit in that there is a process to estimate miles in advance and then reconcile later on.

⁵ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Enforcement 	Enforcement is identical to and can be combined with existing registration enforcement, but might require occasional odometer checks.
Privacy (perception) 	No travel activity is recorded, but some people might object to an odometer being read.

Other Important Factors Related to Concept B: Odometer Charge

Table B.12 Concept B Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. 	There is no way to distinguish travel on Washington public roads versus other roads.
Ability to charge non-Washington residents. 	An alternative approach (e.g., Concept A) would be needed to charge non-Washington residents.

Concept C: Differentiated Distance Charge – Detailed Evaluation

Table B.13 Concept C Evaluation

Performance Criterion/Rating	Analysis
Transparency ★★★★	Principals would pay a special tax bill related to road usage.
Complementary Policy Objectives ★★	Drivers that drive more pay more, so there is some correlation to efforts to reduce congestion, energy use, and emissions. However, there is no distinction between vehicles with high and low fuel efficiency, potentially at odds with Washington’s goals to reduce energy use and greenhouse gas emissions. To address this issue, charges could vary by energy or emissions category, thereby increasing this rating, but this would change other aspects of this evaluation.
Equity: <i>Pay for what you use</i> ★★★★	People pay for each mile they drive and do not pay for miles outside of Washington.
Equity: <i>Urban/rural</i> ★★★	People that drive more pay more. According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city. ⁶ Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Further cost differences from the gas tax approach caused by different fuel economy would be eliminated.
Equity: <i>Regressiveness</i> ★★	People of lower incomes will pay a greater percent of their income than more wealthy people. This could be mitigated with need-based rates.
Equity: <i>Border/Non-Border</i> ★★★★	Out of state miles will not be charged.
Simplicity ★★	The system is less simple than the time permit in that there is a process to estimate miles in advance and then reconcile later on. There is also the added effort of installing an on board unit, and paying a bill periodically. However, if the bill paying is integrated into an existing business relationship (such as through an insurance or utility company), the additional burden should not be onerous.

⁶ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Enforcement ★ ★	Enforcement is more involved than for the other concepts, in that there is no obvious way to find out if someone is cheating the system in real time.
Privacy (perception) ★ ★	Travel activity is recorded. Privacy can be maintained with proper protections in place, but some Principals may be concerned about the perception of privacy infringement.







Other Important Factors Related to Concept C: Differentiated Distance Charge

Table B.14 Concept C Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. ★ ★ ★ ★	There is no way to distinguish travel on Washington public roads versus other roads.
Ability to charge non-Washington residents. ★ ★	An alternative approach is needed to charge non-Washington residents, unless other states adopt a road usage charge, in which case this becomes easier

Combination 1: Concept A (Time Permit) Plus B (Odometer Charge) – Detailed Evaluation

Table B.15 Combination 1 Evaluation

Performance Criterion/Rating	Analysis
Transparency 	Principals would pay a special tax bill related to road usage.
Complementary Policy Objectives 	Drivers that drive more pay more, so there is some correlation to efforts to reduce congestion, energy use, and emissions. However, there is no distinction between vehicles with high and low fuel efficiency, potentially at odds with Washington’s goals to reduce energy use and greenhouse gas emissions. To address this issue, charges could vary by energy or emissions category, thereby increasing this rating, but this would change other aspects of this evaluation.
Equity: <i>Pay for what you use</i> 	People pay for each mile they drive (but they also pay for miles outside of Washington). People that choose to pay the flat rate that do not drive a lot of miles would end up paying more, however there is no reason they should have to, since
Equity: <i>Urban/ rural</i> 	People that drive more pay more. According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city. ⁷ Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Further cost differences from the gas tax approach caused by different fuel economy would be eliminated. When Concept B is combined with Concept A, there is an upper end limit on mileage, potentially easing the burden for rural residents (and others) that drive a lot of miles.
Equity: <i>Regressiveness</i> 	People of lower incomes will pay a greater percent of their income than more wealthy people. This could be mitigated with need-based rates.
Equity: <i>Border/Non-Border</i> 	Since people will pay the same price for all miles, people near the border that frequently travel out of state will pay for more non-Washington miles. However, they may be no worse off than they are now, when they pay gas tax regardless of where they drive. Border residents will not necessarily be worse off than non-border residents from that perspective.

⁷ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Simplicity ★ ★ ★	People would have the option of a simple system (A) or a slightly more complex system (B).
Enforcement ★ ★ ★	Enforcement is identical to and can be combined with existing registration enforcement, but also has an element of odometer reading.
Privacy (perception) ★ ★ ★	No travel activity is recorded, but some might object to odometer reading.







Other Important Factors Related to Combination 1: Concept A (Time Permit) Plus B (Odometer Charge)

Table B.16 Combination 1 Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. ○	There is no way to distinguish travel on Washington public roads versus other roads.
Ability to charge non-Washington residents. ★ ★ ★	With Concept A as part of this, it could be used to charge out of state drivers.

Combination 2: Concept A (Time Permit) Plus C (Differentiated Distance Charge) – Detailed Evaluation

Table B.17 Combination 2 Evaluation

Performance Criterion/Rating	Analysis
Transparency 	Principals would pay a special tax bill related to road usage.
Complementary Policy Objectives 	<p>Under Concept C, drivers that drive more, pay more, so there is some correlation to efforts to reduce congestion, energy use, and emissions. However, there is no distinction between vehicles with high and low fuel efficiency, potentially at odds with Washington’s goals to reduce energy use and greenhouse gas emissions.</p> <p>Drivers that opt for Concept A have little connection to policy objectives.</p> <p>To address this issue, charges could vary by energy or emissions category, thereby increasing this rating, but this would change other aspects of this evaluation.</p>
Equity: <i>Pay for what you use</i> 	People pay for each mile they drive and do not pay for miles outside of Washington. However, for those that choose not to use Concept A, there is no distinction.
Equity: <i>Urban/rural</i> 	<p>People that drive more pay more, if people choose Concept C. According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city.⁸</p> <p>Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Further cost differences from the gas tax approach caused by different fuel economy would be eliminated.</p>
Equity: <i>Regressiveness</i> 	People of lower incomes will pay a greater percent of their income than more wealthy people. This could be mitigated with need-based rates. But people that drive less will pay less, if they choose Concept C. Those that are “unbanked” or “underbanked” may not be able to use Concept C.
Equity: <i>Border/Non-Border</i> 	Out of state miles will not be charged for Concept C, but will be under Concept A.

⁸ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Simplicity ★ ★ ★	This system can be very simple or more complicated depending on the option chosen
Enforcement ★ ★	Enforcement is more involved with Concept C, in that there is no obvious way to find out if someone is cheating the system in real time.
Privacy (perception) ★ ★ ★	People have a choice regarding whether they would like a system that records no travel activity or one that does. People that choose Option C would be less concerned with privacy.







Other Important Factors Related to Combination 2: Concept A (Time Permit) plus C (Differentiated Distance Charge)

Table B.18 Combination 2 Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. ★ ★ ★	There is no way to distinguish travel between Washington public roads and other roads under Concept A, but there is under Concept C.
Ability to charge non-Washington residents. ★ ★ ★ ★	Concept A is the easiest method to charge out of state drivers.

Combination 3: Concept B (Odometer Charge) Plus C (Differentiated Distance Charge) – Detailed Evaluation

Table B.19 Combination 3 Evaluation

Performance Criterion/Rating	Analysis
Transparency 	Principals would pay a special tax bill related to road usage.
Complementary Policy Objectives 	Drivers that drive more pay more, so there is some correlation to efforts to reduce congestion, energy use, and emissions. However, there is no distinction between vehicles with high and low fuel efficiency, potentially at odds with Washington’s goals to reduce energy use and greenhouse gas emissions. To address this issue, charges could vary by energy or emissions category, thereby increasing this rating, but this would change other aspects of this evaluation.
Equity: <i>Pay for what you use</i> 	People pay for each mile they drive under Concepts B and C. Those choosing Concept C do not pay for miles outside of Washington, but those choosing Concept B do.
Equity: <i>Urban/ rural</i> 	People that drive more pay more. According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city. ⁹ Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Further cost differences from the gas tax approach caused by different fuel economy would be eliminated.
Equity: <i>Regressiveness</i> 	People of lower incomes will pay a greater percent of their income than more wealthy people. This could be mitigated with need-based rates.
Equity: <i>Border/Non-Border</i> 	Out of state miles will not be charged For Concept C, but will for Concept B.

⁹ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Simplicity ★ ★	The system is less simple than the time permit in that there is a process to estimate miles in advance and then reconcile later on. There is also the added effort of installing an on board unit, and paying a bill periodically. However, if the bill paying is integrated into an existing business relationships (such as through an insurance or utility company, the additional burden should not be onerous.
Enforcement ★ ★	Enforcement is more involved than the other concepts, in that there is no obvious way to find out if someone is cheating the system in real time.
Privacy (perception) ★ ★	People have a choice regarding whether they would prefer a system that does not record travel activity.

Other Important Factors Related to Combination 3: Concept B (Odometer Charge) Plus C (Differentiated Distance Charge)

Table B.20 Combination 3 Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. ★ ★	There is no way to distinguish travel on Washington public roads versus other roads under Concept B, but there is under Concept C.
Ability to charge non-Washington residents. ○	Neither Concepts B nor C lend themselves well to charging out of state drivers.

Combination 4: Concept A (Time Permit) Plus B (Odometer Charge) Plus C (Differentiated Distance Charge) – Detailed Evaluation

Table B.21 Combination 4 Evaluation

Performance Criterion/Rating	Analysis
Transparency ★★★★	Principals would pay a special tax bill related to road usage.
Complementary Policy Objectives ★★	Drivers have two options where if they drive more, they pay more, so there is some correlation to efforts to reduce congestion, energy use, and emissions. However, there is no distinction between vehicles with high and low fuel efficiency, potentially at odds with Washington’s goals to reduce energy use and greenhouse gas emissions. To address this issue, charges could vary by energy or emissions category, thereby increasing this rating, but this would change other aspects of this evaluation.
Equity: <i>Pay for what you use</i> ★★★★	People can choose the program that is right for them, and whether they need to distinguish between miles within or outside of Washington.
Equity: <i>Urban/ rural</i> ★★★	People that drive more pay more. According to the National Household Travel Survey, those living in rural areas drive ten more miles in a day than those who live in cities. People living in the suburbs drive only about three to four more miles per day than those within the city. ¹⁰ Therefore, rural residents will typically pay more than urban residents, but pay in proportion to the amount they drive. Further cost differences from the gas tax approach caused by different fuel economy would be eliminated.
Equity: <i>Regressiveness</i> ★★	People of lower incomes will pay a greater percent of their income than more wealthy people. This could be mitigated with need-based rates.
Equity: <i>Border/Non-Border</i> ★★★★	People will have a choice as to whether they want to have miles outside of Washington recorded differently (which is possible under Concept C, but not Concept A or B).
Simplicity ★★	Since it is a combination of three concepts, this might be the most confusing of all; however, people can choose the option that best fits their needs and life style.

¹⁰ National Household Travel Survey. http://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw759.html.

Performance Criterion/Rating	Analysis
Enforcement ★ ★	With three potential concepts, enforcement might be more challenging.
Privacy (perception) ★ ★ ★	People have a choice regarding whether they would like a system that does not record travel activity; those selecting Concept C are most likely less concerned with the privacy perception.

Other Important Factors Related to Combination 4: Concept A (Time Permit) Plus B (Odometer Charge) Plus C (Differentiated Distance Charge)

Table B.22 Combination 4 Important Factors

Factor/Rating	Analysis
Ability to distinguish between travel on Washington public roads and private roads. ★ ★	There is no way to distinguish travel on Washington public roads versus other roads under Concepts A and B, but there is under Concept C.
Ability to charge non-Washington residents. ★ ★ ★ ★	Concept A is the easiest method to charge out of state drivers.

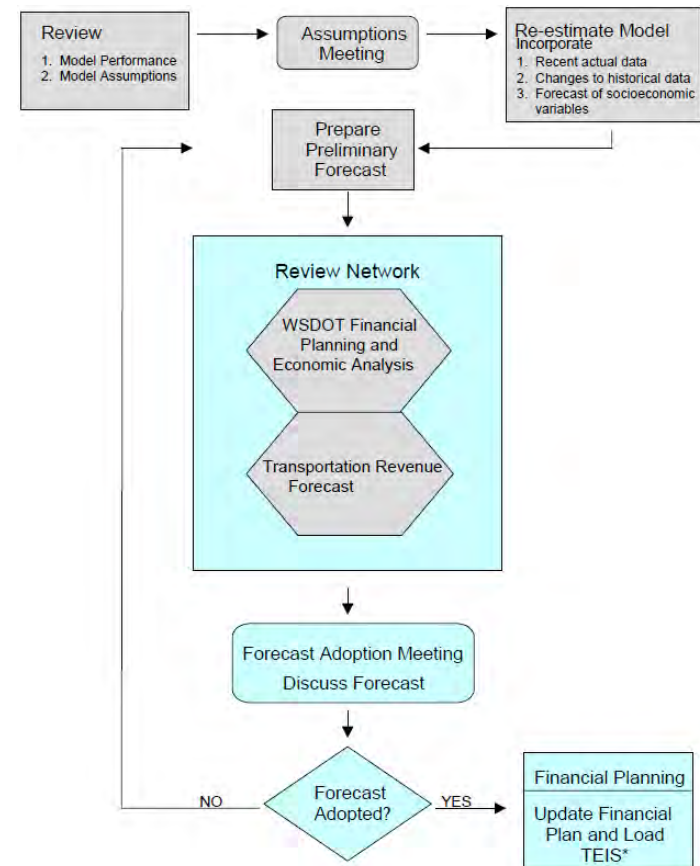
Appendix C: Forecast Details

Overview of Transportation Economic and Revenue Forecasts

We worked with WSDOT and DOL to obtain historic and forecast data for use in the quantitative modeling of costs and revenues of road usage charges and gas taxes. These data are produced by the Transportation Revenue Forecast Council and represent the most up-to-date information on key drivers of gas tax revenue for use in our business case evaluation.

“Washington law mandates the preparation and adoption of economic and revenue forecasts. The organizations primarily responsible for revenue forecasts are the Economic and Revenue Forecast Council and the Office of Financial Management. The Office of Financial Management has the statutory responsibility to prepare and adopt those forecasts not made by the Economic and Revenue Forecast Council (RCW 43.88.020). The Office of Financial Management carries out its forecast responsibilities for transportation revenues through the Transportation Revenue Forecast Council. Each quarter, technical staff of the Department of Licensing, Department of Transportation, Washington State Patrol and the Office of Forecast Council produce forecasts. The revenue forecasts agreed upon by the Transportation Revenue Forecast Council members become the official estimated revenues under RCW 43.88.020 21.”¹¹ A brief overview of the process by which these forecasts are developed by WSDOT each quarter is shown in in the figure.

Transportation-Related Economic and Revenue Forecast Process Flow Chart
(Source: WSDOT)



*Transportation Executive Information System

¹¹ Transportation Revenue Forecast Council, “Transportation Economic and Revenue Forecasts,” Volume 1 Summary, June 2013.

We used the most recent quarterly transportation forecasts¹² for the business case model, which at that time was for June 2013.¹³ These are shown below and are referred throughout this report as the “State forecast.”

Vehicle Registrations of passenger cars by type of fuel (gas, hybrid, diesel, electric and other) and truck registrations by type of fuel (gas or diesel).

Total VMT on all roads in Washington and truck VMT only for the State highway portion of the road network.

- We had to make some assumptions to distinguish VMT by vehicle type (light duty/heavy duty) and fuel type (diesel vs. gasoline) in order to utilize the VMT dataset.

Fuel efficiency of the U.S. fleet based on forecasts from Global Insight.

- We also developed an “implied” State forecast of fuel efficiency based on the forecasts of non-diesel VMT and the State forecast of gasoline consumption.

Gasoline consumption

Gasoline tax revenue

¹² All forecasts are by fiscal year.

¹³ Quarterly Transportation Revenue Forecasts have been released subsequent to this report.

The following forecast components are updated quarterly when WSDOT updates its forecast of transportation revenues. Much of this data is provided by Global Insight – a provider of economic data used widely throughout the transportation industry.

Economic Variables. A host of economic variables are updated, including Washington personal income, population, inflation, employment, oil price index, fuel efficiency, U.S. sales of light vehicles, and Washington driver in-migration:

- **Motor Fuel Price.** The price projections include the following variables: U.S. West Texas crude oil, Washington retail prices of gasoline, diesel and biodiesel:
 - Additionally several State models are utilized in the forecast.
- **Gasoline Consumption.** The quarterly gas consumption model includes the following independent variables:
 - Economic activity (Washington non-agricultural employment);
 - Composite variable of Washington retail gas prices multiplied by U.S. average fuel efficiency; and
 - Dummy variable for periods of severe oil supply shortages.
- **VMT.** Total Washington State VMT forecasts are released once a year. Each new forecast calculated from the actual VMT of the prior year, essentially resetting the forecast annually to the last known actual VMT. The forecast model considers three separate types of impacts on VMT:
 - Economic activity, which is essentially non-farm employment;
 - Motor vehicle registrations; and
 - Gas prices.

VMT Forecast of Non-Diesel Vehicles

Distinguishing Vehicle Type

In our evaluation of road usage charge options, we have assumed that non-diesel vehicles (largely gasoline, but also electric and hybrid vehicles) would discontinue paying the gas tax in 2015 and begin paying a road usage charge. Diesel vehicles would continue to pay a diesel tax and would not pay a road usage charge.

	Diesel Tax	Road Usage Charge
Passenger car – gas		■
Passenger car – diesel	■	
Truck – gas		■
Truck – diesel	■	

VMT Forecast Methodology

Since the road usage charge evaluation is only looking at a potential replacement for the gas tax, we needed to develop a reasonable way to make distinct the VMT of non-diesel vehicles. To estimate VMT of non-diesel vehicles, we made the following calculations:

- First, using the State forecast of vehicle registrations provided by WSDOT, we split the vehicle fleet by weight class (light vehicles and heavy trucks by Class) and fuel category (diesel and non-diesel).
- We applied average annual miles traveled per vehicle from the 2002 U.S. Vehicle Inventory and Use Survey (VIUS) to each heavy truck for Classes 3 through 8. This resulted in total VMT for heavy-duty vehicles, broken down by diesel vs. non-diesel.
- We subtracted all heavy duty VMT from the State forecast of total VMT, which left VMT for all light vehicles. We then divided total light vehicle VMT by the number of light vehicles to get average annual miles traveled per light vehicle.
- Using average miles per light vehicle together with the number of light vehicles by fuel type, we computed VMT for light duty vehicles, broken down by diesel vs. non-diesel.
- Last, we combined VMT for non-diesel light duty vehicles and VMT for non-diesel heavy-duty vehicles.

Forecast Notes

A few notes on this data:

- VMT. The slowing pace of VMT growth has been widely acknowledged by industry professionals across the county and is reflected in the data. Growth factors used for national reporting account for limited future growth. A summary of the national VMT projections is shown below, with annual growth rate ranging from 1.2 percent (which is the most recent) to 1.85 percent.

Source	Forecast Period	Annual Growth Rate	Basis for Growth Rate
Annual Energy Outlook (2013)	2011-2040	1.2 percent	Unknown
Conditions and Performance Report (2010)	2008-2028	1.85 percent	Represents the composite weighted average annual VMT growth rate based on State forecast of VMT in the Highway Performance Management System (HPMS)
AASHTO Bottom Line Report (2009)	2010-2029	1.4 percent	Center for Urban Transportation Research, model projection
Moving Cooler (2009)	2010-2050	1.4 percent	Consistency with AASHTO Bottom Line Report

The State forecast of total VMT on all roads in Washington includes the following notations:

- The State VMT forecast 2013-2017 from Economic and Revenue Forecast Council’s September 2013 forecast. Forecast 2017-2031 is extended based on the Office of Financial Management (OFM) forecast growth rate, September 2013.
- The State VMT forecast 2013-2031 from Transportation Revenue Forecast Council’s September 2013 Forecast.
- The State VMT forecast 2013-2031 from Transportation Revenue Forecast Council’s September 2013 Forecast.
- The State VMT forecast beyond 2031 is not official.

Forecast Notes (continued)

- Gasoline Consumption. The previous WSDOT consumption model had consistently overestimated fuel consumption. WSDOT revised the gasoline consumption forecast model in 2010 and it now includes a variable measuring economic activity to help capture periods of economic recession. The revised gasoline consumption forecast model now reflects a slower growth for future gasoline consumption.
 - As an alternative, we used average on-road fleet fuel efficiency forecasts provided by Global Insight together with non-diesel VMT forecasts to calculate fuel consumption directly.
- Fuel Efficiency:
 - State Forecast. The State forecast of fuel efficiency is derived by dividing non-diesel VMT¹⁴ by the State forecast of gasoline consumption. This results in an “implied” fuel efficiency based on State forecasts.
 - Global Insight Forecast. The Global Insight forecast incorporates the effects of CAFE standards for passenger cars and light trucks for model years 2017 and beyond. On-road fuel efficiency represents the entire fleet on the road in that particular year, meaning that there are still cars using roadways that do not meet the CAFE standard. Actual on-road efficiency is lower than the CAFE standard for new vehicles due to the older vehicles that remain in use:
 - Since the Global Insight forecast only reflects light duty vehicle mpg, we modified it slightly to reflect that fact that 0.9 percent of gasoline vehicles in the forecast of non-diesel VMT are heavy duty. We assumed an average mpg of 10 for all the heavy duty vehicles, and applied the Global Insight forecast for the other 99.1 percent. The result is a minor adjustment to the Global Insight forecast, since heavy-duty vehicles are such a small percent of total vehicles.

¹⁴ As noted, we adjusted the State forecast of total VMT to derive VMT of non-diesel vehicles.

Gas Tax Collection Costs

The Washington State Department of Licensing (DOL) estimated the cost to collect the gas tax at about 0.3 percent of gas tax revenues annually in 2013.¹⁵

In the meantime, we reviewed literature related to the costs associated with administering the gas tax system. Dating back to at least the 1990s, studies have shown that gas tax collection costs represent approximately 1 percent of the revenue collected. A 2011 National Cooperative Highway Research Program (NCHRP) Report titled “Costs of Alternative Revenue-Generation Systems”¹⁶ represents the most robust research recently conducted on this topic, confirming the 1 percent estimate.

The study compared operating costs of highway revenue-generation mechanisms, specifically fuel taxes, tolling, VMT fees, cordon pricing, and parking pricing. Findings show that the existing gas tax system has the lowest operating cost as shown in Table 1.

¹⁵ Washington State Department of Licensing, *Driver and Vehicle Services Fee Study*, December 1, 2013.

¹⁶ NCHRP Report 689, “Costs of Alternative Revenue-Generation Systems,” Transportation Research Board, Washington D.C., 2011.

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Table 1. Rates Cost Comparison Between Revenue Systems

	Fuel Taxes ^a Average Cost over States	Tolling ^a Average Cost over Agencies	VMT Fees ^b Average Cost over Providers	Cordon Pricing Average Cost over Providers	Parking Pricing Cost of Single Provider
\$ per lane mile	\$50	\$150, 595	\$4,042	N/A	N/A
\$ per centerline mile	108	829,991	8,245	N/A	N/A
\$ per 1,000 VMT	1.10	38.58	6.26	N/A	N/A
\$ per vehicle	1.22	N/A	75.16	N/A	N/A
\$ per transaction	N/A	0.54	6.95	N/A	N/A
% of total revenue ^c	0.92%	33.5%	6.6%	38.7%	56.6%
Gross income over total revenues (gross margin in %)	99.1%	66.5%	93.4%	61.3%	43.4%

a For the gas tax, tolling, and cordon pricing systems, data were collected from 2003 to 2007. To make a consistent and accurate comparison between the alternative revenue systems, only 2007 data were used in developing these averages.

b For the VMT fee systems, there is only one-year data available for comparison, and it is based on the revenue forecast to be collected in the Netherlands.

c System-generated revenues only.

Source: Recreated from NCHRP 689.

With respect to the gas tax, states report total costs of administering motor fuel taxes as part of the Federal Highway Administration (FHWA) Highway Statistics Series. These figures include the costs associated with gas tax administration, collection, and enforcement. The NCRP Report used the Highway Statistics data from 2003-2007 to estimate the operating costs of the motor fuel tax system. From 2003 to 2007, operating costs as a percent of total tax collections were consistent, with an average of 1.1 percent (Table 2). The NCRP Report selected eight sample states for more detailed analysis. Findings reveal an average of approximately 1 percent of total revenue utilized for operating state gas tax system (Table 3).

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Since the cost of collecting the gas tax should not vary based on the actual amount collected, it is also instructive to look at the statistics from the perspective of cost per vehicle. For the eight states surveyed in the NCHRP Report, gas tax collection costs ranged from \$0.74 per vehicle to \$2.38 per vehicle.

Table 2. Net State Motor Fuel Tax Collections and Collection Expenses (2003-2007) (\$000)

	2003	2004	2005	2006	2007	Average
Net motor fuel tax collections	\$33,276,518	\$34,696,386,	\$35,038,064	\$36,278,026	\$39,377,467	\$35,733,292
Collection expenses	\$326,377	\$494,404	\$309,325	\$373,615	\$405,096	\$381,763
Collection expense as a percentage of tax collections	1.0%	1.4%	0.9%	1.0%	1.0%	1.1%

Source: Recreated from NCHRP 689.

Gas Tax Collection Costs (continued)

Table 3. Comparison of Total Operating Costs Between State Fuel Tax Systems (Average Cost 2003-2007)

Cost Item	Average Over States	CA	CO	FL	ID	IA	NJ	TN	TX
\$ per lane mile	\$49	\$63	\$15	\$90	\$30	\$5	\$69	\$63	\$47
\$ per centerline mile	105	141	32	196	61	10	151	133	99
\$ per 1,000 VMT	0.10	0.07	0.06	0.12	0.19	0.04	0.08	0.17	0.13
\$ per vehicle	1.24	0.74	1.49	1.52	2.18	0.35	0.93	2.38	1.78
% of total revenue	0.94%	0.72%	0.50%	1.16%	1.32%	0.28%	1.00%	1.43%	1.03%

Source: Recreated from NCHRP 689.

In 2012 the Reason Foundation published a report titled “Dispelling the Myths: Toll and Fuel Tax Collection Costs in the 21st Century.” The authors challenge conventional wisdom regarding gas tax revenue collection costs, arguing that operating costs are higher, perhaps even 5 percent. It should be noted that there are no supporting data provided in the report so it is difficult to determine from where this percentage is derived.

The authors claim that indirect costs are not captured in these estimates, and therefore the operating costs of the gas tax system are higher than widely believed. Indirect costs are noted as:

- Distributors’ cost of recording and reporting gas taxes are passed on to retailers, which are then passed on to consumers;
- IRS tax filings by exempt users (e.g., costs for processing and managing fuel tax credits);
- Losses due to fuel tax violation, which while uncertain, may be higher than assumed; and
- The opportunity cost of forgoing the benefits of variable or congestion pricing in financing roads with taxes rather than tolls.

However, the VMT forecasts do not distinguish VMT by vehicle type (light duty/heavy duty). As a result, we had to make several assumptions in order to utilize these datasets.

Appendix D: Road Usage Charge Administration Cost Categories

Summary of Cost Categories

Below are summary descriptions of the seven cost categories used to determine the cost of collecting road usage charges in Washington:

- Program administration. The cost of management salaries and overhead for the program.
- Account management. The cost of operating accounts for individuals paying road usage charges, including the cost of payment transactions.
- Information Technology. The cost to state agencies of building and maintaining IT infrastructure sufficient to perform all road usage charge functions.
- Enforcement. This category includes two sub-categories:
 - Evasion. The lost revenue due to evasion of road usage charges, which is computed as evasion minus funds recovered through the audits and enforcement; and
 - Debt Recovery. The cost to recover unpaid road usage charges owed to the state.
- Audit. The cost to investigate the possibility of fraud in a small subset of road usage charge payers.
- Public Relations. Informing the public of the road usage charge program existence, purpose, requirements and alternatives.
- Cash flow. Short-term borrowing necessary to keep state finances in its current form in case road usage charge revenues are received post-pay, as opposed to the pre-pay nature of the current gas tax.

Program Administration

This category includes salaries, benefits, and overhead for management of the program. Management includes the following positions (the number of positions is indicated in parenthesis):

- Overall road usage charge program director (1).
- Road usage charge IT director (1).
- Director of public relations and communications for road usage charging (1).
- Compliance manager (1).
- Manager of road usage charge program evaluation (1). This position lasts through 2023 at which time we assume road usage no longer requires a dedicated program evaluation but rather is subsumed into the overall performance monitoring and evaluation functions of the agency overseeing road usage charging.
- In the case that service providers or outside contractors are involved, a manager for road usage charge contracts and service agreements with vendors and service providers (1).
- Managers for the audit division, assuming 1 manager per 10 auditors.
- Managers for the account management division, assuming 1 manager per 20 transaction processing technicians.
- Office assistants, assuming 1 assistant per 3 management positions.

Account Management

Account management involves managing customers, including conducting transactions for opening and closing accounts and, most importantly, accepting payments. The model's estimate of account management costs includes labor (salary, benefits, and overhead), materials, transaction fees (e.g., credit card fees), and in-vehicle equipment.

The estimation of costs is based on transactions, which drive the need for labor and materials and are the events on which fees are based. The model contains a transactions "engine" which calculates the number of transactions by type over the course of 1 year. Examples of transaction types include:

- Concept A, annual payment, online with a credit card.
- Concept B, semiannual payment, in person with a check.

In all there are 135 transaction types assumed for purposes of the simplified business case. The model determines how many customers choose each type of transaction on an annual basis, based on existing data about customer payment methods and future expected trends toward e-commerce. Next, the model calculates the cost of each transaction based on credit card processing fees, materials (e.g., envelopes, printing, stamps for mail-based statements and payments), and average time for staff to process in-person and mail-in payments.

In addition to the above, we consider the cost of any in-vehicle hardware required under Concept C as part of the account management costs. For purposes of simplified business case modeling, we assumed Concept C would require devices that plug into the vehicle diagnostic port. Currently, such hardware is available for under \$50 at small volumes. In addition, this approach requires electronic communications between the device and the agency's back office for transmitting mileage data, which form the basis of invoices. Such costs are currently about \$3-5 per month for the volumes of data envisioned, but declining rapidly as wireless providers accommodate new machine-to-machine applications, including bundling machine-to-machine data with other wireless data (such as mobile phone plans) to reduce prices. We assume that the state will pay for half the costs of the devices and the monthly communications under Concept C, with the other half paid either directly by the customer or the device provider in the case that it is bundled with other services. This is reasonable because in the future Concept C is most likely to be based on factory-installed telematics in the vehicle that the Principal can activate to transmit mileage data either directly from the vehicle or via a wireless link from the vehicle to a mobile phone or tablet.

Information Technology

Information technology is a major cost for the state agency responsible for road usage charging. Although Concepts A and B integrate with existing processes fairly well, to be conservative, we assume significant IT investment for all three Concepts.

- **Setup costs.** Based on industry estimates from vendors who provide IT systems, we estimated the initial acquisition of hardware and software for road usage charging for a program of 6 million accounts at \$30 million. However, we assumed that any acquisitions and/or upgrades would be done as part of a broader IT improvement effort for any agency, and therefore input a cost of \$20 million. In reality, this cost reflects a system with the sophistication to accommodate Concept C. Concepts A and B could be implemented at much lower cost. However, it is reasonable to expect that any system would migrate toward the more automated Concept C in the long run, so we assumed the higher cost for all scenarios.
- **Maintenance.** There are annual maintenance costs equal to 1 percent of the initial investment and major maintenance every 8 years equal to 70 percent of the initial investment.
- **Software.** Ongoing software costs, including licenses, were assumed to be \$1 million per year.
- **Labor.** Finally, we assumed a dedicated IT staff of 10 specialists, which is equivalent to more than two professionals working in parallel 24/7/365. Management of road usage charge IT is counted separately as part of the program administration cost category.

Enforcement

Enforcement encompasses a wide range of activities including operational concept design to maximize voluntary compliance, audits to increase compliance further, and enforcement of evasion through roadside policing and back-office analytics, and collections on accounts payable from noncompliant customers. For purposes of cost modeling, operational concept design is not an additional cost, while the cost of audit is estimated as a separate category. We assume no cost of roadside policing as such enforcement is already widespread. That leaves two categories of costs to consider for road usage charge enforcement in the simplified business case:

- Evasion. The lost revenue due to evasion of road usage charges, which is computed as evasion minus funds recovered through the audits and enforcement.
- Collections. The cost to recover funds owed to the state through State collections processes.

Evasion

For Concepts A and B, we assume that enforcement will occur for road usage charge in the same way it currently occurs for vehicle registration—at the roadside. It is illegal for motorists who fail to register or renew their vehicle’s registration to operate their vehicles on public roadways, and those caught doing so can be fined and penalized. For Concept C, on the other hand, enforcement is more virtual, using automated processes to detect nonpayment, evasion, and fraud.

For Concept A, we assume a compliance rate of 95 percent. This may be conservative given that the number of registered vehicles in DOL’s forecasts represents the number of actual, registered, compliant vehicles in Washington. Any evaders or noncompliant vehicles are not included in the population of vehicles that we estimate. Still, we assume 5 percent will evade payment of the additional time permit, and thus 5 percent of the revenue will be lost.

For Concept B, we assume 90 percent compliance since, although all vehicles must register and estimate mileage, some Principals will underestimate in an attempt to evade. This rate is improved by auditing a certain percentage of Principals. We adopted an audit rate of 1 percent for Concept B in the model and assumed that this measure improved compliance to 95 percent. This is comparable to estimates from New Zealand’s light vehicle road user charge system, for which the Ministry of Transport has estimated 94 percent compliance.

For Concept C, we adopt the same assumptions as for Concept B.

Enforcement (continued)

Recovery of Unpaid Road Usage Charges

State and Federal revenue agencies, including toll agencies, attempt to recover unpaid tax debt from taxpayers. Unpaid tax debt, as long as it is knowable, can be difficult to obtain for a variety of reasons, including insolvency or bankruptcy of the taxpayer, failure to locate, and other reasons. According to the Government Accountability Office, the Internal Revenue Service collected between 30 percent and 41 percent of unpaid tax debt during the years 2002-2007, averaging 37 percent over that period.¹⁷

The cost to recover unpaid debt includes labor (“collections” agents plus overhead), attorney fees, court costs, credit reports, and other costs. There are several benchmarks for estimating this cost. According to the Association of Credit and Collections Professionals, in 2010 private collections agencies earned \$10.3 billion in commissions on \$54.9 billion in total debt recovered, or about 18 percent.¹⁸ State agencies may have lower costs than private agents. For example, an Oregon state agency that does in-house recovery on unpaid tax debt charges 16 percent of the recovered revenue as a service fee. For purpose of this study, we assume a recovery cost of 16 percent of unpaid debt collected.

In summary, for purposes of financial modeling at this time, we assumed 37 percent of evaded revenue could be collected through a collections process, at a cost of 16 percent of the amount recovered. For example, for every \$1 evaded, the agency will recover \$0.37, but spend \$0.06 to collect it, so the net recovery is \$0.31, or 31 percent.

¹⁷ Source: Government Accountability Office. “Tax Debt Collection: IRS Has a Complex Process to Attempt to Collect Billions of Dollars in Unpaid Tax Debt.” Report GAO-08-728, June 2008.

¹⁸ Source: “The Impact of Third-Party Debt Collection on the National and State Economies,” February 2012, <http://www.acainternational.org/products-collections-information-5431.aspx>.

Audit

A critical aspect of the road usage charge program closely related to enforcement is audit of individual Principals to ensure compliance. Although the audit process may identify and recover some unpaid charges, its primary purpose is to encourage voluntary compliance. The model makes the following assumptions:

- For Concept A, there are no audits as the collection of a time permit is linked with the registration renewal process.
- For Concept B, although odometer charges are linked with the registration renewal process, audits will help to ensure accurate reporting and estimation of odometer readings by Principals. We assume an audit rate of 1 percent of active Concept B accounts.
- For Concept C, mileage reporting is automated, but to encourage proper usage of vehicle electronics and to discourage fraud, we assume an audit rate of 1 percent of active Concept C accounts.

Audits are carried out by auditors. For Concept B, an audit is a very simple matter, as it merely requires a verified odometer reading, whether provided in person by the auditor or remotely by a certified odometer reader (e.g., at a vehicle service or repair facility). We assume an average audit requires 1 hour of time to complete. For Concept C, audits may require additional time not only to obtain the odometer reading but to read and understand the data reported by the in-vehicle hardware and locate any possible discrepancies, errors, or instances of possible fraud (e.g., removing the device). We assume an average audit requires 2 hours of time to complete.

Costs of the audit category include the following:

- \$5 in materials per audit, which includes the cost of mailing notices and potentially obtaining third party verified odometer readings; and
- Labor costs associated with auditors averaging 2000 hours per year conducting audits under the supervision of audit managers (1 manager per 10 auditors, whose costs are included in the program administration category). Costs include salary, benefits, and overhead.

Public Relations

Public relations involves costs associated with informing the public of the road usage charge program existence, purpose, and requirements, including Principals’ alternatives for registration, operation, payment, and compliance. We assumed a cost of \$1 per new account per year to cover the cost of production and materials for informational materials to be mailed to residents directly, placed in strategic locations, such as DOL agent and subagent offices, and for other media such as public notices via print, radio, TV and electronic media. We assume an additional cost of \$0.50 per existing account per year to cover similar costs to maintain customer information and awareness. Earned media, such as informational news stories, TV reports, and web reports via blogs and other sites, are not counted as part of the PR cost. These activities are overseen by a director of public relations whose labor costs are counted as part of program administration.

Cash Flow

A potential transition from gas tax to road usage charge may create a one-time cash flow issue for WSDOT that rely on regular monthly revenues to fund ongoing operations. The reason for this gap is that the gas tax is “prepay” meaning that the tax is collected at the terminal rack several days or weeks before the gas is used by drivers to travel on roadways. Under a road usage charge, Principals will continue to prepay under Concepts A and B, but under Concept C, payment for road use will not occur until after road usage has occurred, leaving a gap in revenues.

In addition, it is possible that the net revenue from a road usage charge is less than the net revenue from gas taxes in the early years due to higher collection costs.

Therefore, WSDOT may have to borrow funds to fill the gap created by these cash flow issues. The interest payments on these borrowed funds are counted as a cost to the road usage charge program.





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WASHINGTON STATE RUC ASSESSMENT,
(PHASE 3) DRAFT FINAL REPORT, INCLUDING
PROPOSED WORK PLAN FOR FY 2015

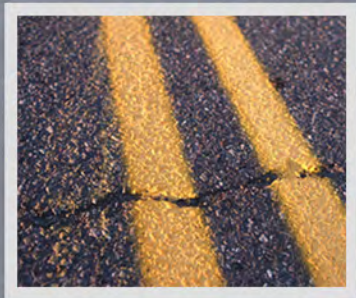
November 13, 2013

 **WA RUC**



Draft Final Report, Including Proposed Work Plan for FY 2015

For Discussion at
Steering Committee Meeting #9



Document #7
November 13, 2013



Washington State Transportation
Commission



Washington State
Department of Transportation



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Additional Documents

The following foundational material was used by the Steering Committee to reach the conclusions in this report:

- *Report 1: Domestic and International Review and Policy Context*, Steering Committee #1 Briefing Material, September 13, 2012;
- *Report 2: Potential Road Usage Charge Concepts for Washington*, Steering Committee #2 Briefing Material, October 23, 2012;
- *Report 3: Feasibility Assessment, Work Plan & Budget*, Steering Committee #4 Briefing Material, January 23, 2013;
- *Report 4: Proposed Road Usage Charge Concepts for Business Case Evaluation*, Steering Committee Meeting #6 Briefing Material, June 5, 2013;
- *Report 5: Briefing Materials for Discussion at Steering Committee Meeting #7*, September 6, 2013;
- *Report 6: Preliminary Business Case Evaluation*, Steering Committee #8 Briefing Material, October 7, 2013; and
- Presentations at nine Steering Committee meetings.

These are available on the Steering Committee’s web site: <http://waroadusagecharge.wordpress.com/>.

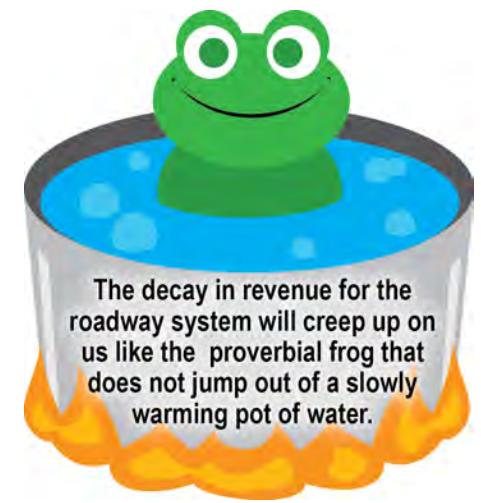


What We Found

What we found...

This evaluation of road usage charging answered the Legislature's request to evaluate the business case and identify issues important to further refine the preferred operational concepts and to gain public acceptance.

- Last year, we found that road usage charging was feasible in Washington. This year, we tested the business case.
- We evaluated three potential road usage charge concepts and found that a business case could be made for all three.
 - > The long-term financial results would be superior to the status quo under a wide range of assumptions.
 - > The preferred road usage charge concept would provide choices, providing for differentiation between in-state and out-of-state driving through in-vehicle devices but allowing options that do not collect such specific data.
- The pace at which the fleet becomes more fuel efficient will determine how much better the road usage charge system would be than continuing with the current gas tax—this pace is highly uncertain, leading to uncertainty in the business case outcomes
- Washington could raise the gas tax to achieve similar financial objectives, but rates would have to be frequently raised again and again, before considering eroding buying power due to inflation.
 - > Increases to the gas tax can be a short term solution, but they will be barely adequate.
 - > A more sustainable solution is needed in the long-term, and road usage charges can be that solution.
- It will take years to refine a road usage charge concept into an achievable program.
 - > A road usage charge will face both technical and public acceptance issues.
- There is value to continuing these investigations so that we have solutions ready when the time comes.



Executive Summary

This evaluation started with a policy framework constructed by the Steering Committee, picking up where last year's feasibility evaluation left off

- Last year, we found that road usage charging was feasible in Washington. This year, we tested the business case.
- We evaluated road usage charging policy issues, operational concepts, and whether there was a business case, and it identified implementation issues.
- The Steering Committee recommended a policy framework that guided the business case evaluation.
 - > The Steering Committee recommended one goal that answers the question, “why are we doing this?”
 - The goal is to identify and develop a sustainable, long-term revenue source for Washington State’s transportation system to transition from the current gas tax system.
 - > The Steering Committee recommended 13 guiding principles (not in priority order) on how we would implement the goal:

<ul style="list-style-type: none">• Transparency• Complementary policy objectives• Cost-effectiveness• Equity• Privacy	<ul style="list-style-type: none">• Data Security• Simplicity• Accountability• Enforcement	<ul style="list-style-type: none">• System Flexibility• User Options• Interoperability and Cooperation• Phasing
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- > There are some principles that the Steering Committee considers to be important, but on which it deferred recommendation: Whether it is important to distinguish between travel on Washington public roads and other roads (e.g., outside the State) and whether people from outside Washington should pay.

We evaluated three operational concepts that represent a range of potential ways to implement road usage charging.

A: Time Permit

Principals buy permits to drive an unlimited number of miles for a given period (e.g., a year, a quarter, or a month).



B: Odometer Charge

Principals estimate the number of miles they expect to drive in a year and reconcile the amounts at the end of the year.



C: Differentiated Distance Charge

Principals install devices in their vehicles that record mileage and transmits the information to an entity¹ that submits bills and collects revenue.



What are "Principals"?

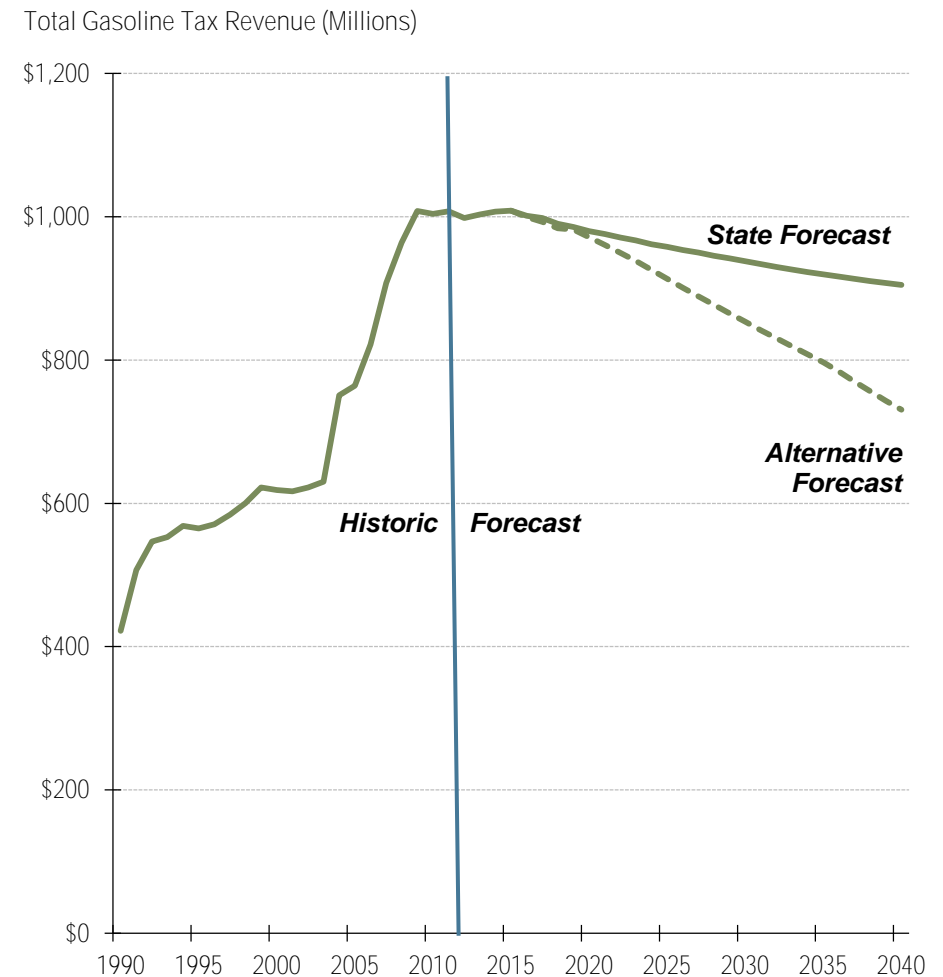
Throughout the study, we have referred to the person responsible for paying a road usage charge as the "Principal," recognizing that the "driver" or "owner" of a vehicle is not always the person responsible.

¹ For purposes of this preliminary analysis, we assume that government is the entity billing and collecting revenue, recognizing the potential for outsourcing if private entities could bid lower prices than government is able to provide.

The business case evaluation presents financial and non-financial considerations, so that policy-makers can balance the two.

- The goal and guiding principles articulated by the Steering Committee were the basis for performance criteria.
- The business case evaluation started with two key assumptions to keep the analysis simple:
 - > Road usage charges would replace the gas tax in 2015, with little transition period, at a rate equal to expected gross tax revenue in 2015; and
 - > Road usage charges would apply to all vehicles that do not use diesel fuel.
- We developed a financial model that estimates costs and revenues of road usage charges and gas taxes for a range of forecast scenarios for 2015-2040.
 - > Assumptions regarding future fuel economy and resulting gas tax revenue turned out to be the most significant and challenging assumption.

Historic and Forecast Gas tax Revenue
FY 1990 to FY 2040



In all cases, road usage charging yielded higher net revenues for the 2015-2040 period – the biggest influence was improved fuel economy.

- We estimate road usage charging to yield up to \$2.1 billion to \$3.1 billion more than the gas tax between 2015 and 2040 depending on the fuel economy forecasts assumed.
- There are considerable differences in the costs of collection between the three road usage charge concepts we evaluated:
 - > Concepts A and B are least expensive (7 and 8 percent of revenue, respectively), and therefore generate the highest net revenue.
 - > Concept C is between 12 and 13 percent.
 - > The combination of Concept A, B, and C is just under 10 percent.
- The costs of collection for the road usage charge concepts include evasion losses and costs of collections.
- The cost of collection for the gas tax is estimated at 0.8 percent, but it does not include an estimate of evasion:
 - > Evasion is the one area of our analysis where we were not able to do an “apples to apples” comparison.
- The financial evaluation could differ with alternative assumptions, so we conducted several sensitivity tests to see whether the findings would change:
 - > None of these sensitivity tests changed the outcome that road usage charging would yield more net revenue over time for Washington than the gas tax, although, in some cases, the difference narrowed when we used the State forecast.
- Frequent gas tax increases could achieve the same financial result as road usage charges, but the issue of declining gas tax revenue over time would remain.

None of the concepts clearly outperforms the others when considering the non-financial evaluation criteria.

- Each has advantages and disadvantages. How important these advantages and disadvantages are to Principals will affect preferences for one concept over another – along with the financial consequences described earlier.
- > Appendix A provides details of the business case evaluation.

Concept	Advantages	Disadvantages
Gas Tax	<ul style="list-style-type: none"> • Simple • Easy to enforce • No privacy issues 	<ul style="list-style-type: none"> • Long-term declining revenue source due to increased fuel economy and decrease in driving • Not transparent. People recognize it as a tax, but are not aware of the amount, payment, or use • Imperfect proxy for road usage in that it varies greatly according to the fuel economy of individual vehicles
Concept A: Time Permit	<ul style="list-style-type: none"> • Transparent • Relatively simple to use • Easy to enforce • No privacy issues 	<ul style="list-style-type: none"> • No relationship to road use
Concept B: Odometer Charge	<ul style="list-style-type: none"> • Transparent • Relatively simple to use • Easy to enforce • Privacy not a significant issue (but Principals might object to mileage reporting) • Strong relationship to use 	<ul style="list-style-type: none"> • No differentiation between driving in-state, out-of-state or on private roads
Concept C: Differentiated Distance Charge	<ul style="list-style-type: none"> • Transparent • Strongest relationship to use, recording miles driven in-state, out-of-state, or on private roads 	<ul style="list-style-type: none"> • More complicated to use than others • Perception of privacy infringement • More difficult to enforce

The Steering Committee found that the business case for road usage charging has been made as a long-term gas tax replacement.

- For today, the gas tax is still a viable source of revenue:
 - > Internal combustion engines that burn gasoline are expected to make up 96 percent of the fleet in 2015, declining only by about half a percentage point by 2040.
- However, all signs point toward gradual improvement in fuel efficiency of internal combustion engines, which will result in declining revenue from the gas tax:
 - > The pace at which the fleet becomes more fuel efficient will determine how much better the road usage charge system would be than continuing with the current gas tax—this pace is highly uncertain, leading to uncertainty in the business case outcomes.
- In the short-term, gas tax increases can make up for the declining value of the gas tax.
- As gas-burning vehicles become more fuel efficient, these more efficient vehicles will pay less per mile in gas tax than vehicles that burn more gasoline:
 - > Many people find this inequitable, but this inequality can also be seen as being consistent with other energy and emission reduction policies in Washington:
 - GHG emission reduction goals and requirements²;
 - VMT reduction benchmarks per capita³;
 - Installation of outlets for electric vehicle charging at State’s fleet parking and maintenance facilities⁴; and
 - Fuel economy standards of the State vehicle fleet.⁵

² RCW 70.235.020 and RCW 70.235.050.

³ RCW 47.01.440.

⁴ RCW 43.19.648.

The Steering Committee expressed broad consensus to move forward with all three operational concepts and to begin addressing the “parking lot” questions.

- The work plan for 2014 should address the key issues that would be need to be resolved to create legislation to move road usage charging forward in the 2015 legislative session:
 - > First priority –Refine the concept of operations and explore transition options.
 - > Second priority – Inform the 2015 Legislative session.
 - > Third priority –Enable implementation, but defer until new legislation is passed.
- The work plan should include the following tasks:
 - > Refine Policy Direction Addressing the Highest Priority “Parking Lot” Issues. Support the Legislature, the Washington State Transportation Commission (the “Commission”), and the Steering Committee in establishing road usage charge policies for Washington State. Top priority issues include:
 - Which vehicles should be subject to a road user charge?
 - Should out-of-state drivers be charged, and if so, how?
 - Which Principals should be exempt, if any?
 - How could Washington transition from the gas tax?
 - > Develop a Concept of Operations. Define how system users will experience the system when driving and paying charges.
 - > Risk Analysis. Identify risks and potential mitigation measures to minimize adverse impacts and the cost of such impacts.
 - > Business Case. Refresh the business case evaluation with more details and finer resolution data.
 - > Coordination, Management, and Documentation.
 - > Continuing Work Spring 2015. The specifics to be defined by the Steering Committee based upon 2015 legislative direction.

⁵ RCW 43.41.130

Section 1: Introduction

This phase of the road usage charge evaluation recommended policy objectives, explored operational concepts, tested whether there was a business case, and identified implementation issues.

- The 2013 Legislature provided funding to the Commission solely for development of a business case addressing the transition from a gas tax to a road usage charge system as the basis for funding the State’s transportation system:
 - > The funding was provided for fiscal year 2014 only.
 - > The business case evaluation is due to the Governor and the Transportation Committees of the Legislature in time for inclusion in the 2014 supplemental transportation Omnibus Appropriation Act.
- The Commission was directed to:⁶
 - > Develop preliminary road usage charge policies that are necessary to develop the business case, as well as supporting research.
 - > Develop the preferred operational concept(s) that reflect the preliminary policies.
 - > Evaluate the business case and assess likely financial outcomes.
 - > Identify and document policy and other issues that are deemed important to further refine the preferred operational concept or concepts and to gain public acceptance. These issues should form the basis for continued work beyond this funding cycle.

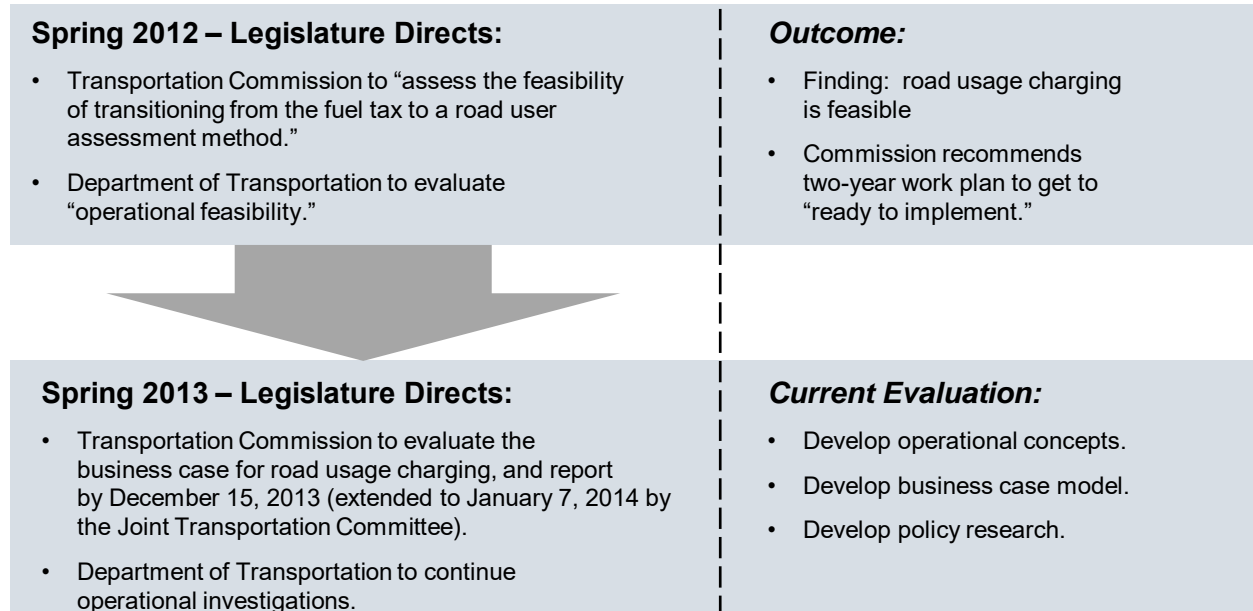
⁶ ESSB 5024 Section 205(3).

In the prior fiscal year, the Legislature directed a study to determine the feasibility of a road usage charge.

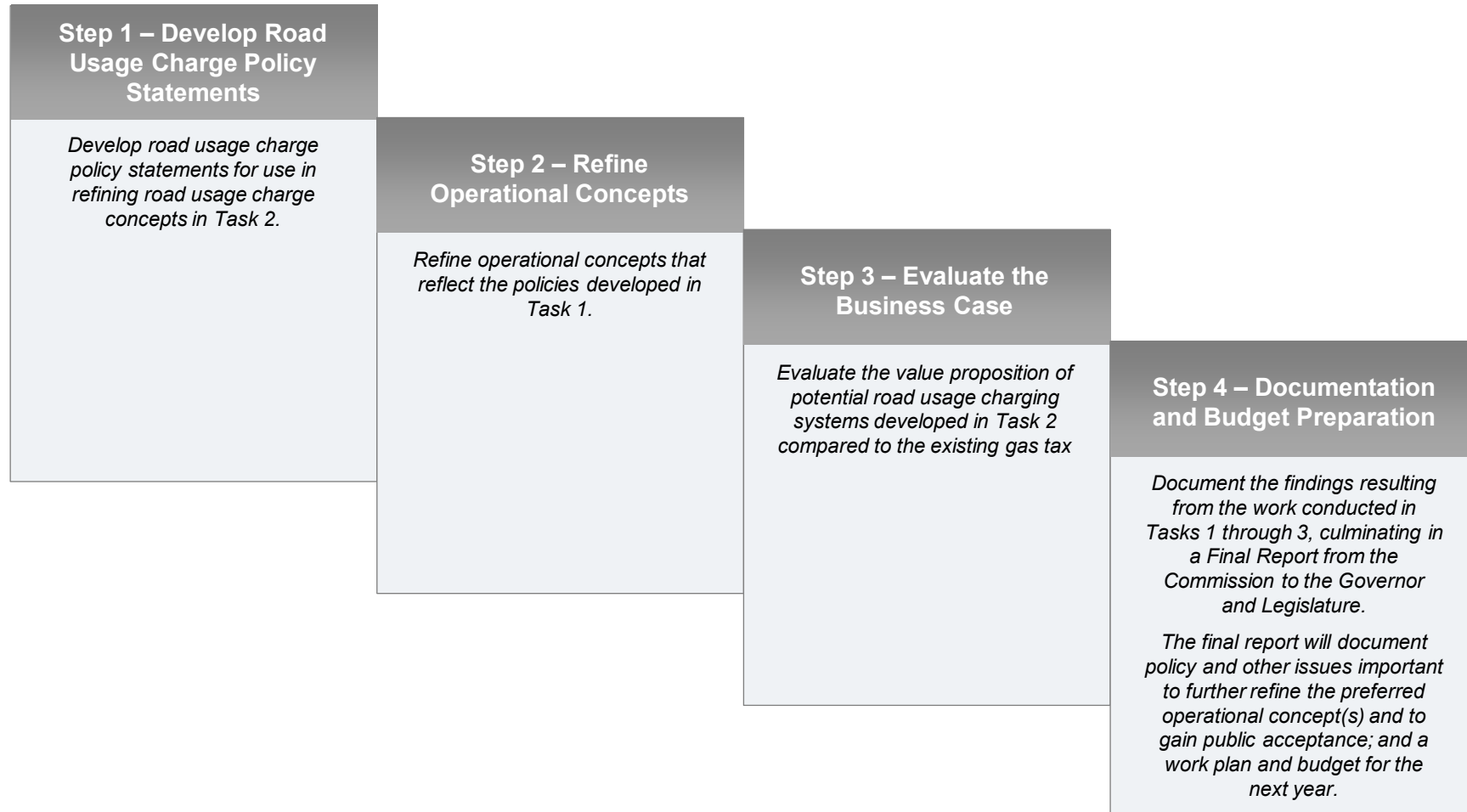
- The 2012 Legislature provided funding to the Commission “solely to determine the feasibility of transitioning from the gas tax to a road user assessment system of paying for transportation.”
 - > The Legislature also provided funding to the Washington State Department of Transportation (WSDOT) “solely to carry out work related to assessing the operational feasibility of a road user assessment, including technology, agency administration, multistate and Federal standards, and other necessary elements.” Both efforts were conducted under the guidance of a Steering Committee.

Overview of Legislative Directives from 2012 and 2013 and Their Outcomes

- The Steering Committee recommended to the Commission, and the Commission agreed that road usage charging was feasible and that further work was needed to get to the “ready to implement” stage.
- The figure on this page provides an overview of the 2012 and 2013 legislative directives and outcomes.



The 2013 evaluation began by clarifying policy objectives, proposed illustrative operational concepts, then evaluated the business case.



The 2013 Steering Committee represents key stakeholders, including Legislators.

Name and Affiliation	Representing	Name and Affiliation	Representing
Steering Committee Chair, Commissioner Tom Cowan (WSTC Commissioner)	WSTC	Rod Brown Jr. (Cascadia Law Group PLLC)	Environmental
Commissioner Anne Haley (WSTC Commissioner)	WSTC	Pete Capell (Clark County Public Works)	Cities and counties
Commissioner Charles Royer (WSTC Commissioner)	WSTC	Cynthia Chen (University of Washington)	Appointed by WSTC
Sen. Tracey Eide (Federal Way (D) 30 th District)	Washington Senate	Scott Creek (Crown Moving Company, Inc.)	Trucking industry
Sen. Curtis King (Yakima (R) 14 th District)	Washington Senate	Don Gerend (City of Sammamish Councilmember)	Cities and counties
Sen. Andy Billig (Spokane (D) 3 rd District)	Washington Senate	Tom Hingson (Everett Transit)	Public transportation
Rep. Judy Clibborn (Mercer Island (D) 41 st District)	Washington House of Representatives	Sharon Nelson	Appointed by WSTC
Rep. Jake Fey (Tacoma (D) 27 th District)	Washington House of Representatives	Lynn Peterson (WSDOT Secretary)	Appointed by WSTC
Rep. Linda Kochmar (Federal Way (R) 30 th District)	Washington House of Representatives	Janet Ray (AAA Washington)	Motoring public
Rep. Ed Orcutt (Kalama (R) 20 th District)	Washington House of Representatives	Neil Strege (Washington Roundtable)	Business
Curt Augustine (Alliance of Automobile Manufacturers)	Auto and light truck manufacturers	Ted Trepanier (INRIX)	User fee technology
Kurt Beckett (Port of Seattle)	Appointed by WSTC		

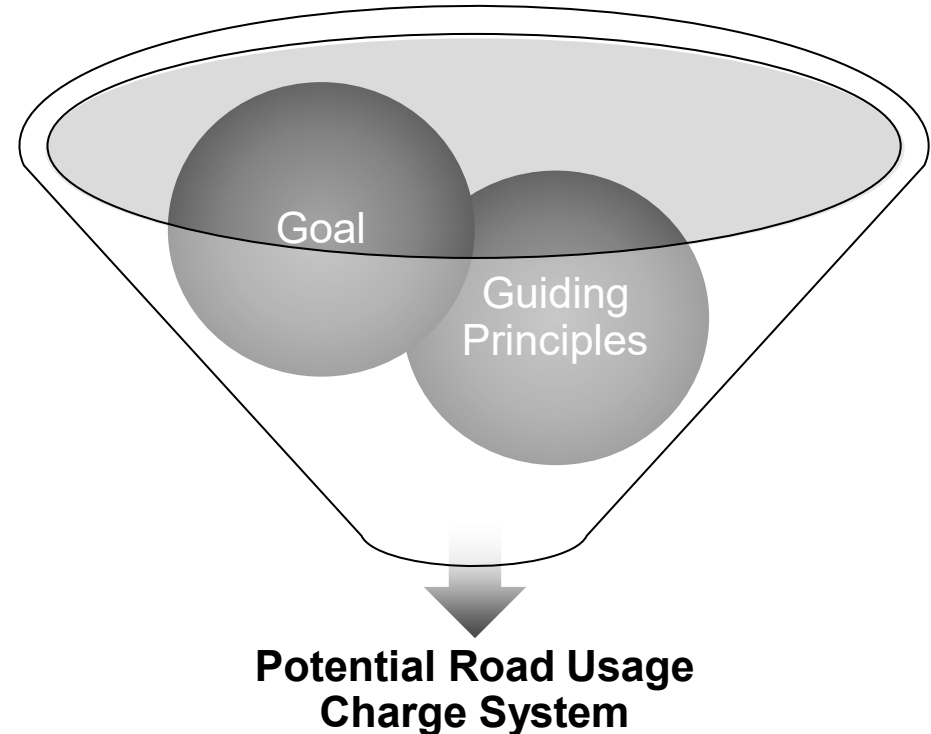
The Steering Committee found that the business case for road usage charging has been made, and that continuing work should resolve outstanding issues.

- These are the key findings and recommendations, detailed on the pages that follow:
 - > Gasoline consumption and tax revenue are forecast to decline due to improving fuel economy.
 - > Road usage charging can be a long-term gas tax replacement.
 - > The business case for road usage charging has been made.
 - > The Steering Committee expressed broad consensus to move forward with all three operational concepts and to start addressing the “parking lot” of implementation issues.
- In the remainder of this report, we:
 - > Explain the policy framework underpinning our work (Section 2).
 - > Summarize the operational concepts evaluated (Section 3).
 - > Provide our business case analysis, including comparisons of the effect that different road usage charge concepts would have on different types of drivers (Section 4).
 - > Identify policy and other issues to further refine the preferred operational concepts and to gain public acceptance (Section 5).
 - > Provide a proposed work plan and budget for FY 2015 (Section 6).
- There are also appendices in a separate document: A) Update of business case evaluation (quantitative and qualitative; B) Forecast details; and C) Business case cost evaluation, provided as a separate document.

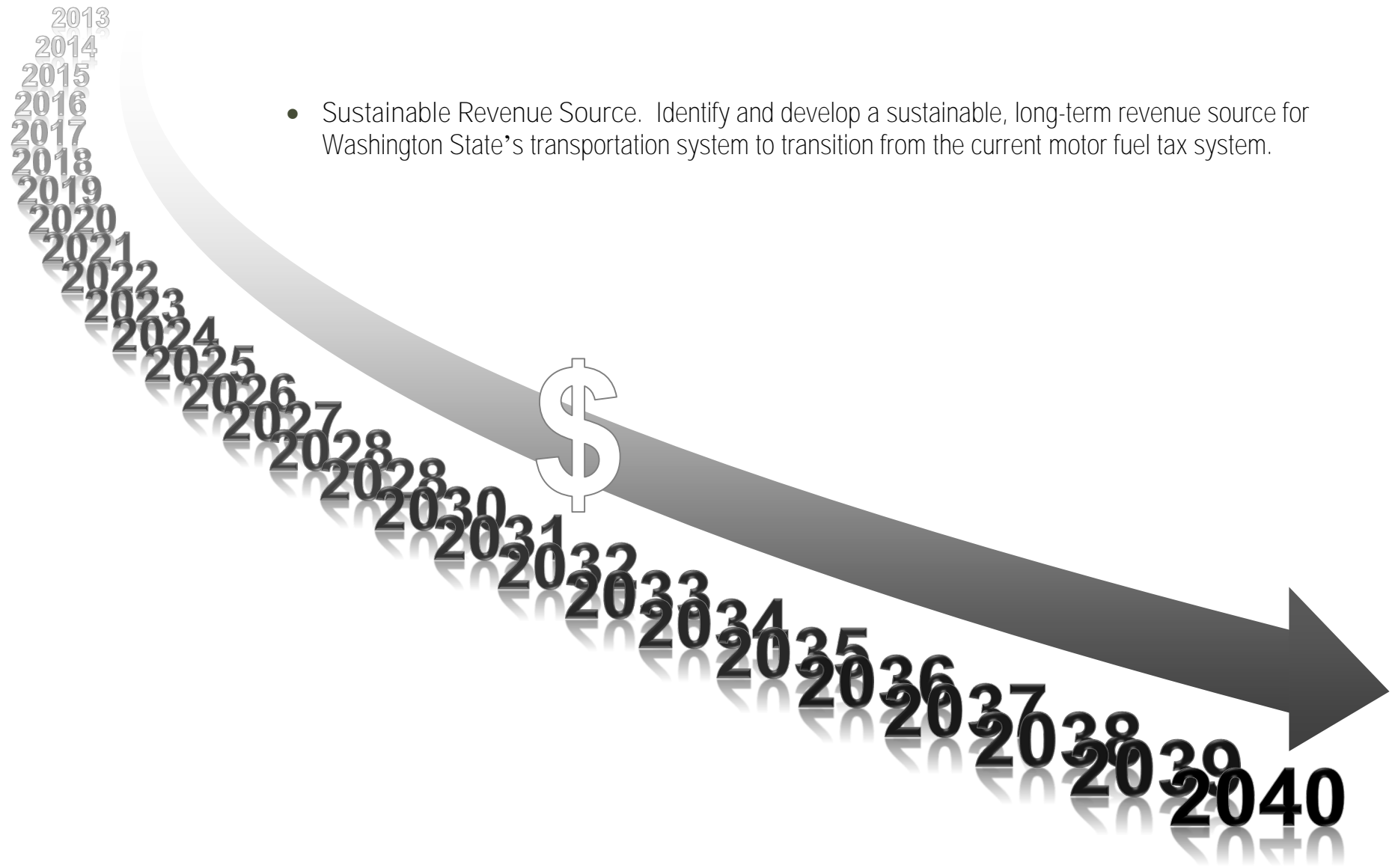
Section 2: Policy Framework

The Steering Committee recommended a policy framework that guided the business case evaluation.

- The Steering Committee developed a single goal and 13 guiding principles to guide the business case evaluation of potential road usage charge concepts:
 - > The goal and guiding principles are recommendations to the Legislature from the Steering Committee and the Transportation Commission.
- The goal and guiding principles were translated into performance criteria that were used to evaluate the business case for the road usage charging concepts.
- Ultimately, this goal and the guiding principles could guide further development of a road usage charge system, if it were to move forward:
 - > The goals and guiding principles are subject to modification over time, but provide a reasonable starting point for evaluation.
- Not all the potential road usage charge concepts are fully consistent with all the guiding principles:
 - > These differences can form some of the basis for choosing among the alternative proposals.



The Steering Committee recommended one goal that answers the question, “why are we doing this?”



The Steering Committee recommended 13 guiding principles on how we would implement the goal.

Transparency	A road usage charge system should provide transparency in how the transportation system is paid for.
Complementary policy objectives	A road usage charge system should, to the extent possible, be aligned with Washington’s energy, environmental, and congestion management goals.
Cost-effectiveness	The administration of a road usage charge system should be cost-effective and cost efficient.
Equity	All road users should pay a fair share with a road usage charge.
Privacy	A road usage charge system should respect an individual’s right to privacy.
Data Security	A road usage charge system should meet applicable standards for data security, and access to data should be restricted to authorized people.
Simplicity	A road usage charge system should be simple, convenient, transparent to the user, and compliance should not create an undue burden.
Accountability	A system should have clear assignment of responsibility and oversight, and provide accurate reporting of usage and distribution of revenue collected.
Enforcement	A road usage charge system should be costly to evade and easy to enforce.
System Flexibility	A road usage charge system should be adaptive, open to competing vendors, and able to evolve over time.
User Options	Consumer choice should be considered wherever possible.
Interoperability and Cooperation	A Washington road usage charge system should strive for interoperability with systems in other states, nationally, and internationally, as well as with other systems in Washington. Washington should proactively cooperate and collaborate with other entities that are also investigating road usage charges.
Phasing	Phasing should be considered in the deployment of a road usage charge system.




There are some principles that the Steering Committee thinks are important, but deferred recommendation.

- Ability to distinguish between travel on Washington public roads and other roads (private and out-of-state).
- Ability to charge non-Washington residents. Should a potential system be able to collect revenue from out-of-state drivers, since this could add considerably to the cost of operation, but not very much to the revenue.



Section 3: Operational Concepts for Business Case Evaluation

Three operational concepts represent a range of potential ways to implement road usage charging.

A: Time Permit	Principals buy permits to drive an unlimited number of miles for a given period (e.g., a year, a quarter, or a month) for each registered vehicle.	
B: Odometer Charge	Principals estimate the number of miles they expect to drive in a year for each registered vehicle and reconcile the amounts at the end of the year.	
C: Differentiated Distance Charge	Principals install a device in each vehicle (or use an existing device) that record mileage and transmit the information to an entity ⁷ that submits bills and collects revenue.	

What are "Principals"?

Throughout the study, we have referred to the person responsible for paying a road usage charge as the "Principal," recognizing that the "driver" or "owner" of a vehicle is not always the person responsible.

⁷ Note that in prior work, we had assumed that this entity would be a private service provider. However, based on feedback from the Commission, the function is now assumed to be provided by government, with the potential for outsourcing if private entities could bid lower prices than government is able to provide.

Concept A: Time Permit provides unlimited miles in a given period.

- Principals would buy permits for each registered vehicle to drive an unlimited number of miles for a given period of time (such as a year, half-year, quarter, or month):
 - > Permits would be purchased at the same time as vehicle registration.
 - Most permits would be for a full year, but shorter periods (month, quarter, and half-year) could be available.
 - Stickers could be issued to indicate the time for which a Principal has paid. Alternatively, this time could be stored in a database.
 - > If Washington decides to charge fees on out of state vehicles, Principals could pay through kiosks at the border, sales through agents (e.g., gas stations, convenience stores), or online.
- From the Road Usage Charge Authority’s perspective, this is similar to the procedure that the Department of Revenue current handles vehicle registration, with additional functions for account and customer relations management (CRM).



Concept B: Odometer Charge is a simple system that counts miles, but cannot distinguish miles driven inside or outside Washington.

- Principals would pre-pay for the amount of miles they expect to drive each registered vehicle in a given period (year, half-year, quarter, or month):
 - > They would self-report the number of miles actually driven at the end of the given period, and reconcile their payment.
 - > Severe under-estimation could result in penalties (but they can pay for additional miles to avoid penalties).
 - > This is a similar concept to Federal income taxes in which taxpayers estimate their tax liabilities for the year, pay taxes in installments, either through estimated taxes or payroll deductions, and reconcile at the end of the year with their annual tax returns.
 - > Stickers could be issued indicating that the Principal has paid for the given period.
- This allows the road usage charge to vary directly with the corresponding amount of road usage:
 - > However, this system does not distinguish miles driven inside Washington from those outside Washington.
- From the Road Usage Charge Authority's perspective, the accounting and CRM functions would be similar and slightly more extensive than the Time Permit (Concept A).







Concept C: Differentiated Distance Charge involves an in-vehicle device that records miles differentiated by inside and outside Washington State.

- Concept C is much different from the other two in that it involves placing electronic devices in people's vehicles, or using devices that already exist (such as for pay-as-you-drive insurance):
 - > The devices would be capable of recording miles, distinguishing whether they were on Washington public roads, outside Washington, or on private roads, and periodically transmitting this data to an organization that will handle billing.
 - > The devices would most likely be provided as complements to other in-vehicle services, such as pay-as-you-drive insurance, navigation, and concierge services.
 - > For this business case evaluation, we assumed that the government would carry out this function:
 - However, if further evaluation finds that the private sector can carry out this function more cost effectively than government, then the business case would be better than indicated in this analysis.
- This is the most technically involved of the three concepts and would require a sophisticated accounting and CRM system.
- Enforcement would be through technical certification of the entity responsible for collecting the data and odometer readings:
 - > From the Road Usage Charge Authority's perspective this would require extensive accounting and CRM systems – considerably more extensive than for Concepts A and B:
 - Accounting and CRM functions would be similar to tolling, but the scale of the undertaking would be considerably greater, since tolling only applies to a small proportion of drivers who use one of three tolled facilities in Washington.



We also considered combinations of concepts.

<p>Time Permit (A) + Odometer Charge (B)</p>	<p>The time permit is simple and non-invasive requiring a lump sum fee. The odometer charge is directly proportional to road usage.</p>	
<p>Odometer Charge (B) + Differentiated Distance Charge (C)</p>	<p>The odometer charge would be proportional to usage, while the differentiated distance charge is a technological option that is proportional to usage and can distinguish between in-state and out-of-state miles.</p>	
<p>Time Permit (A) + Differentiated Distance Charge (C)</p>	<p>The time permit is simple and non-invasive requiring a lump sum fee each year. Differentiated distance charge is proportional to usage and can distinguish between in-state and out-of-state miles.</p>	
<p>Time Permit (A) + Odometer charge (B) + Differentiated Distance Charge (C)</p>	<p>Offering all three concepts provides the greatest amount of consumer choice.</p>	

For more detail on the operational concepts, please reference Report 5 “Briefing Materials for Discussion at Steering Committee Meeting #7,” September 6, 2013.

The rate setting process will be established by the Legislature and Governor, but we needed to make some assumptions for the business case evaluation.

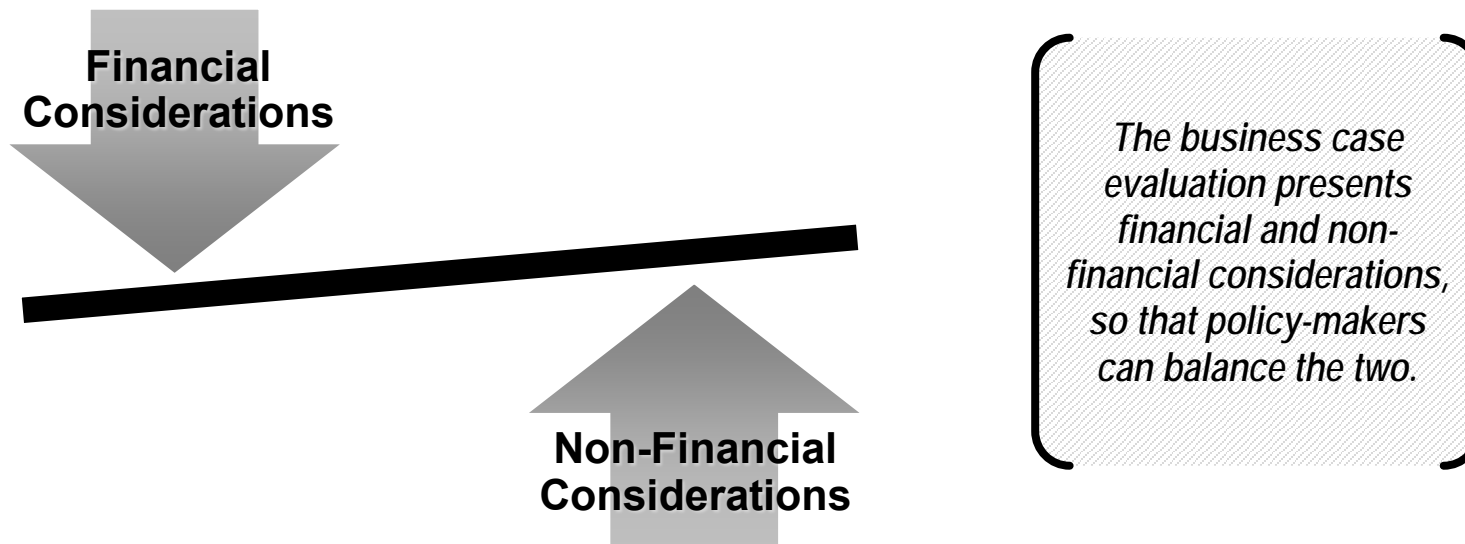
- We assumed that regardless of the tax approach selected, the road usage charge would be revenue neutral with the gas tax (at its 2013 rate of 37.5 cents per gallon) in terms of gross revenue in 2015, and that the rates would remain in effect throughout the 2015-2040 forecast period.
- Similarly, we assumed that the current gas tax of 37.5 cents per gallon would remain from 2015-2040. Gas tax revenue in 2015 is forecast to be just over \$1.0 billion, to be paid by 5.812 million vehicles driving 54,150 million miles.
- We assumed that neither the road usage charge rate nor the gas tax rate would be tracked to inflation and that both rates would remain the same from 2015 onward.

Alternative	Rate	Unit	Basis
Existing Gas Tax	\$0.375	Gallon	Current rate.
A: Time Permit	\$172	Year	This equals the average annual Washington State gas tax forecast for 2015, which is total annual gas tax collections divided by the number of registered non-diesel vehicles.
B: Odometer Charge	\$0.018	Mile	An amount equal to the total Washington State gas tax collections forecast for 2015 divided by the total number of miles driven by Washington non-diesel vehicles.
C: Differentiated Distance Charge	\$0.018	Mile	An amount equal to the total Washington State gas tax collections forecast for 2015 divided by the total number of miles driven by Washington non-diesel vehicles.

Section 4: Business Case Evaluation – Overview

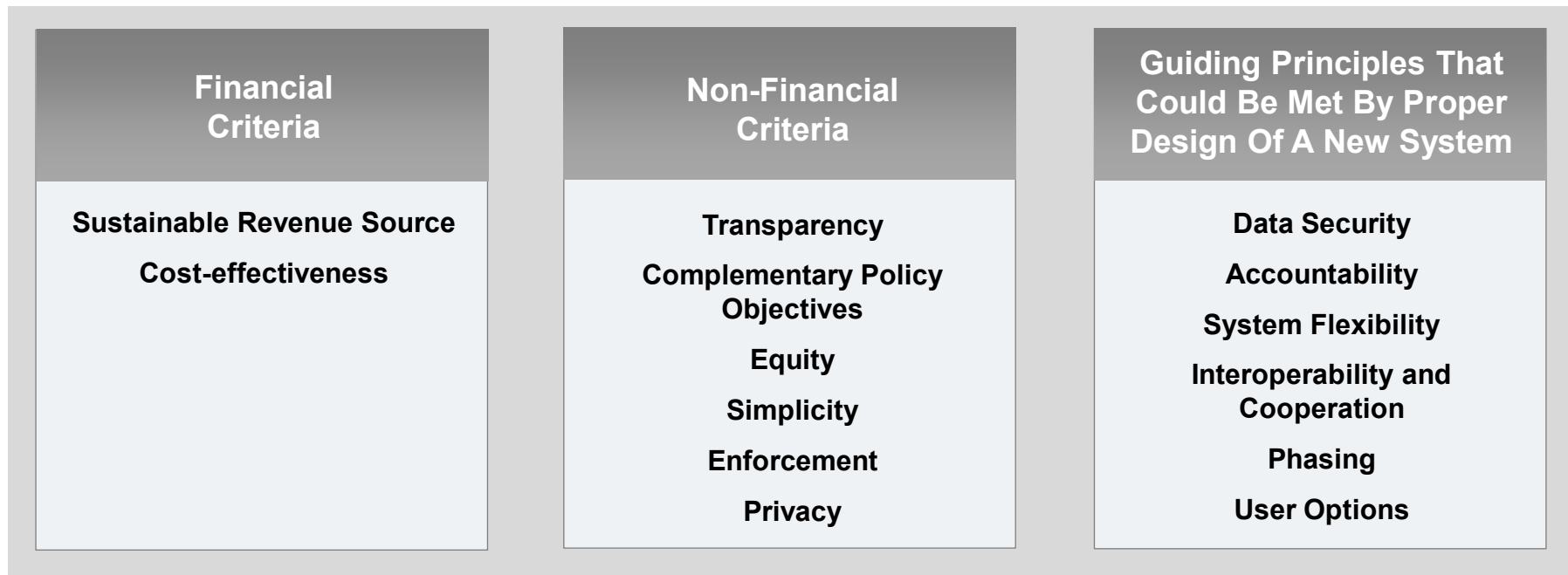
A business case evaluation involves financial analysis of costs, benefits, risks, alternative solutions, and the net return on investment.

- The business case evaluation allows decision-makers to compare alternative policy proposals (including the status-quo scenario), enabling an informed business decision.
- This simplified business case evaluation focuses on the value of the proposition of road usage charging in terms of dollars and cents and an evaluation of how well it achieves non-financial objectives.
 - > In short, both parts of the business case should answer the question: Is road usage charging worth doing?



We used the goal and guiding principles articulated by the Steering Committee as the basis for business case evaluation performance criteria.

- The goal and guiding principles translated into financial and non-financial criteria.
- Many of the performance criteria do not lend themselves to either financial or qualitative evaluation, but should be incorporated into any road usage charge system. These were not used in the business case evaluation to distinguish options, but were incorporated indirectly in the cost side of the analysis.
- The goal and guiding principles were used in these three ways in the business case evaluation.



“Equity” is a topic that seems simple, but quickly gets complex.

- One of the Steering Committee’s guiding principles was that “All road users should pay a fair share with a road usage charge.”
- Equity can be looked at through many lenses. We identified four components of equity that addressed this principle, and evaluated each of them (see details in Appendix A):
 - > Pay for what is used;
 - > Urban/rural driving;
 - > Regressiveness; and
 - > Border/Non-Border (to address concepts that might not distinguish out-of-state travel).
- However, it is important to remember that looking at the distribution of who pays what does not provide a full picture of equity. Other specifics of how the fee is structured, how revenue is used, and what services are provided can significantly change the equity equation.

The Transportation Research Board’s Committee on Equity Implications of Transportation Finance Mechanisms had this to say about equity:

The most important lesson from the committee's work is that broad generalizations about the fairness of HOT lanes, cordon tolls, and other evolving mechanisms oversimplify the reality and are misleading. Equity can be assessed in many ways (e.g., in terms of income or geography and across generations). Furthermore, the specifics of policy instrument design, revenue usage, and service delivery can change equity outcomes as judged by any equity criteria. Thus, the fairness of a given type of finance mechanism depends on how it is structured, what transportation alternatives are offered to users, and which aspects of equity are deemed the most important. It is impossible to draw reliable conclusions about the equity of a particular type of finance mechanism without delving into the details.

We translated the financial oriented goals and guiding principles into two performance measures.

Net Present Value of Cash Flow

- Net present value (NPV) is an accepted method of evaluating cash flow over a long time horizon. It recognizes the time value of money, putting higher value on cash spent or received today than in later years.
 - NPV adds up the present value of revenue and subtracts the present value of cost to yield a consistent value of net revenue over the course of the entire evaluation period.
- The time period for evaluation was 2015-2040.
- We assumed annual cost inflation of 2 percent per year based on historical averages.
- We used a discount rate of 3 percent based on published guidance from the US Office of Management and Budget.

Cost of Collection as a Percentage of Gross Revenue

- The present value of cost divided by the present value of revenue tells us what percentage of the revenue is consumed by costs.
- This is a simple indicator of cost-effectiveness.

We evaluated the non-financial criteria on a scale from zero through four stars, with comments to provide additional insights.

The qualitative evaluation rating criteria are shown below.

Criteria	Rating
Completely Satisfies Criteria	★ ★ ★ ★
Mostly Satisfies Criteria	★ ★ ★
Moderately Satisfies Criteria	★ ★
Minimally Satisfies Criteria	★
Does Not Satisfy Criteria	○

- The ratings are the subjective judgment of the consultant team and were employed to provide a starting point for the Steering Committee’s consideration.
- We provide an assessment of how well each of the three operational concepts on a standalone basis achieves the criteria, along with commentary explaining our rationale.
- The Steering Committee identified two considerations that they did not treat as guiding principles, but were important nonetheless:
 - > Ability to distinguish between travel on Washington public roads and other roads (private and out-of-state).
 - > Ability to charge non-Washington residents.
- We treated these considerations similarly to the non-financial criteria, but in a separate category.
- Details of these evaluations are in Appendix A.

The business case evaluation started with two key assumptions.

Road Usage Charge Would Replace the Gas Tax in 2015, with Little Transition Period

- There are numerous ways to transition from the gas tax to a new charge system, and the number of permutations would overwhelm this simplified business case evaluation.
- Road usage charges would be set at a rate that would result in the same gross revenue in 2015 as would be generated by the gas tax.
- If there is a business case to be made for any of the alternatives, the implications of different transition approaches can be evaluated in the next phase of work, if the Legislature directs further study.

Road Usage Charges Would Apply to All Vehicles that Do Not Use Diesel Fuel

- The legislative directive was to transition from the gas tax, so we assumed that road usage charges would apply to all vehicles that do not use diesel fuel.
 - In other words, vehicles powered by gasoline, gasoline hybrids and plug-in hybrids and electric vehicles would be charged.
 - These vehicles subject to the road usage charge are referred to as non-diesel vehicles.
 - Diesel vehicles would continue to pay the diesel tax, and would not pay a road usage charge.
- Our initial approach to only charge “cars” (i.e., light duty vehicles) and not trucks proved problematic, since approximately 25 percent of trucks use gasoline.
 - Our assumption avoids the difficulty of trying to distinguish cars from trucks at the gas pump, or creating other means of refunding gas taxes.
 - Gasoline fueled trucks represent only 1 percent of all gasoline vehicles.

We developed a financial model that estimates costs and revenues of road usage charges and gas taxes for a range of forecast scenarios for 2015-2040.

The forecast scenarios are based on various forecasts of travel characteristics, demographics, and other assumptions:

- Registrations of non-diesel vehicles.
- On-road gasoline consumption in Washington, used to compute gasoline tax revenues.
- VMT associated with non-diesel vehicles in Washington.
- Fuel efficiency of non-diesel vehicles.

Important operational and economic assumptions include:

- Expected adoption rates of each operational concept.
- Account audit rates.
- Salary costs.
- Information Technology (IT) equipment costs.
- Credit card merchant fees.
- Inflation and discount rates.

Financial results are expressed as the present value of:

- Gross revenues
- Costs of collection, including developing the systems and compliance and enforcement
- Net revenue
- Cost as a percentage of revenue
- Amount the gas tax would need to be raised to yield the same net revenue as a road usage charge concept

Section 4a: Business Case Evaluation – Forecasts

A key element of the business case analysis involved forecasts of vehicles, VMT, fuel efficiency and consumption, and gas tax revenue.

- We started with forecasts provided by WSDOT and DOL based on data developed by the State’s Transportation Revenue Forecast Council, and refined them for use in our analysis to identify characteristics of non-diesel vehicles only:
 - > These forecasts are based on the adopted June 2013 Transportation Economic and Revenue Forecast, the most recent quarterly transportation forecast available at the time.⁸
 - > These forecasts rely on a variety of sources, including forecasts purchased from Global Insight, a private economic forecasting firm
 - > The consultant team did further analysis to create forecasts of the vehicles, VMT, fuel efficiency and consumption, and gas tax revenue for non-diesel vehicles. Details are provided in Appendix B.
- We created variations of these forecasts to represent alternative forecasts of future travel and demographic trends.

⁸ Quarterly Transportation Revenue Forecasts have been released subsequent to this report.

Non-diesel vehicles are expected to increase in line with historical trends, but we reflect the possibility of lower registrations in an alternative forecast.

State Forecast of Non-Diesel Vehicles

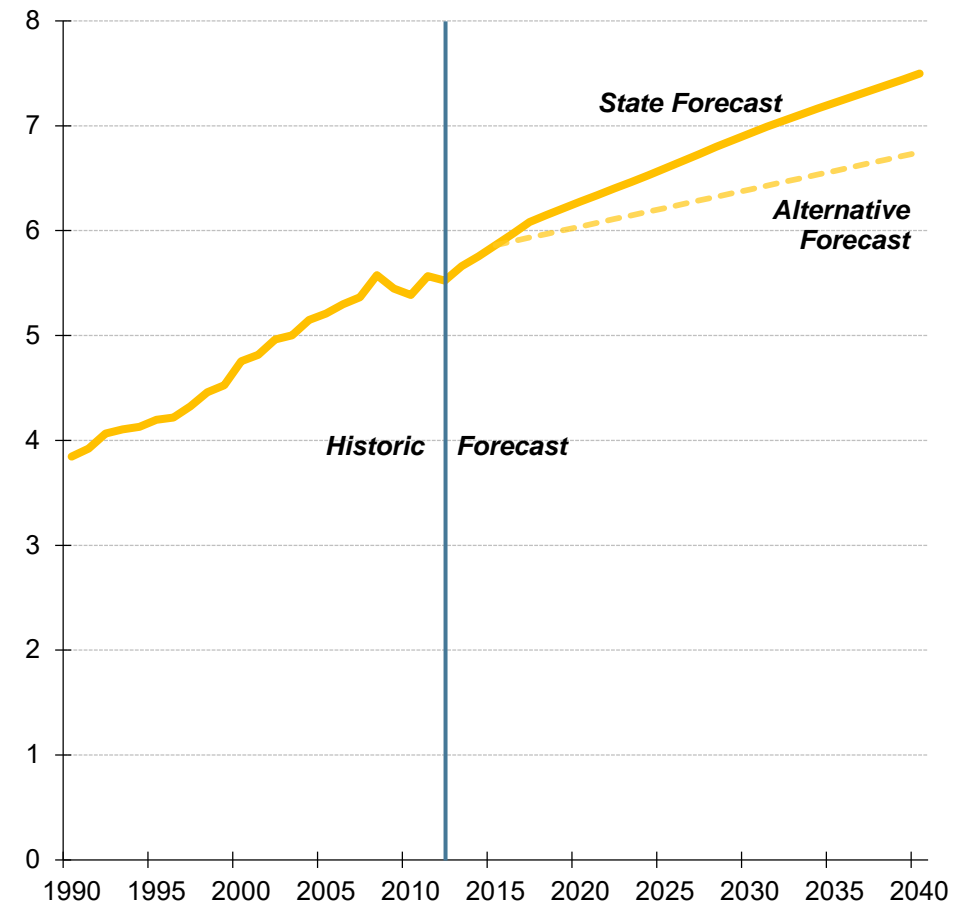
- Non-diesel vehicles climbed from 1990-2008, growing 2.1 percent per year, but fell during the Great Recession.
- The State forecasts a recovery, at lower growth rate of 1.0 percent per year from 2015-2040.

Alternative Forecast

- We prepared an alternative estimate that is 10 percent below the State forecast by 2040 (with a constant rate of change from 2015 to 2040), to capture potential variations in the growth of non-diesel vehicles.
- This lower-bound estimate, while arbitrary, is an illustrative reduction for purposes of the simplified business case analysis.

Historic and Forecast Non-Diesel Vehicles
FY 1990 to FY 2040

**Total Non-Diesel Vehicles
(Millions)**



The analysis reflects lower VMT growth rates than historically for non-diesel vehicles and is consistent with aggressive VMT reduction benchmarks defined in State law.

State Forecast Based on VMT for Non-Diesel Vehicles

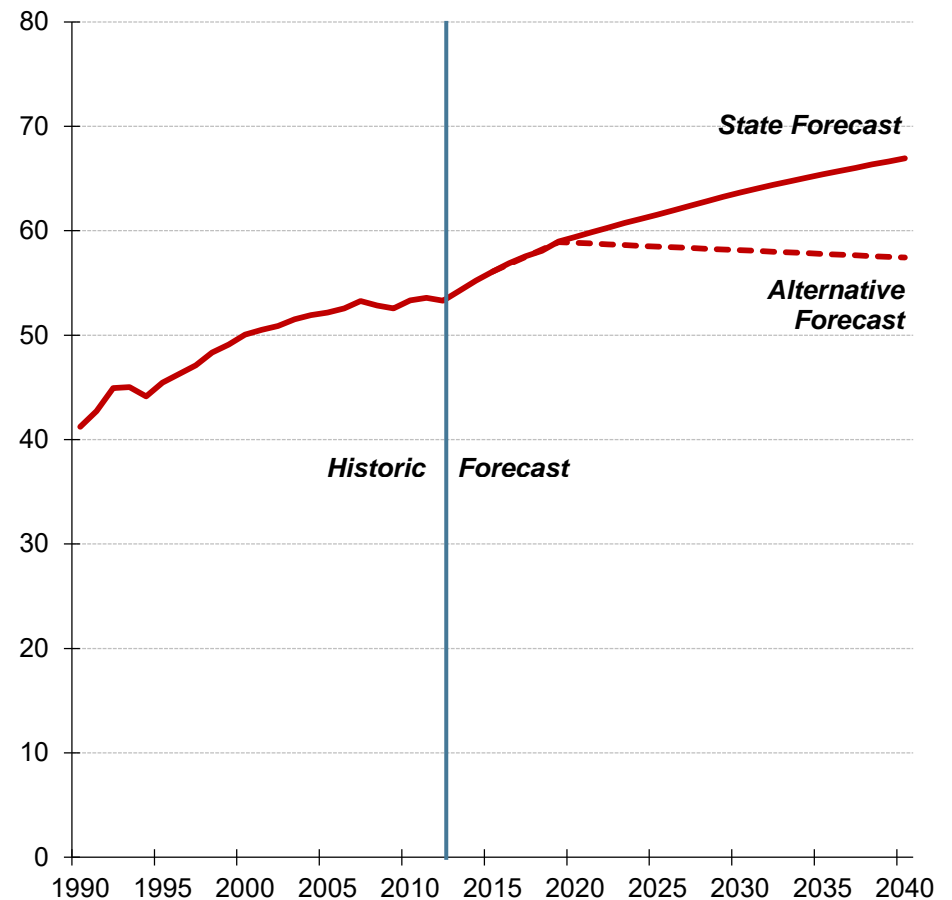
- VMT grew steadily at a rate of 1.4 percent per year from 1990 to 2008, but faltered from then to 2012.
- The State forecasts modest (0.7 percent per year) growth from 2015 to 2040.
- Slower growth of VMT in Washington is consistent with national trends.

Alternative Forecast

- The alternative forecast is based on the VMT reductions from RCW 47.01.440, passed in 2010, which requires reductions in light duty vehicle VMT per capita of 18 percent by 2020, 30 percent by 2035, and 50 percent by 2050 against a baseline value set at 75 billion VMT in 2020.
- The State forecast does not reflect these benchmarks.
- The alternative forecast shows the effect of these reductions, which dampens VMT so that it is only 2.4 percent higher in 2040 than in 2015.

Historic and Forecast VMT for Non-Diesel Vehicles
FY 1990 to FY 2040

VMT per Non-Diesel Vehicles (Billions)



The implied State forecasts suggest modest fuel economy improvements through 2040—but other forecasts anticipate far higher fuel economy improvements.

Fleet Fuel Economy and CAFE Standards

- Fleet fuel economy reflects the fuel efficiency of the entire on-road fleet in any particular year, which changes slowly.
- The 54.5 CAFE standard is somewhat misleading – it translates to an EPA sticker fuel economy of 36 mpg.⁹

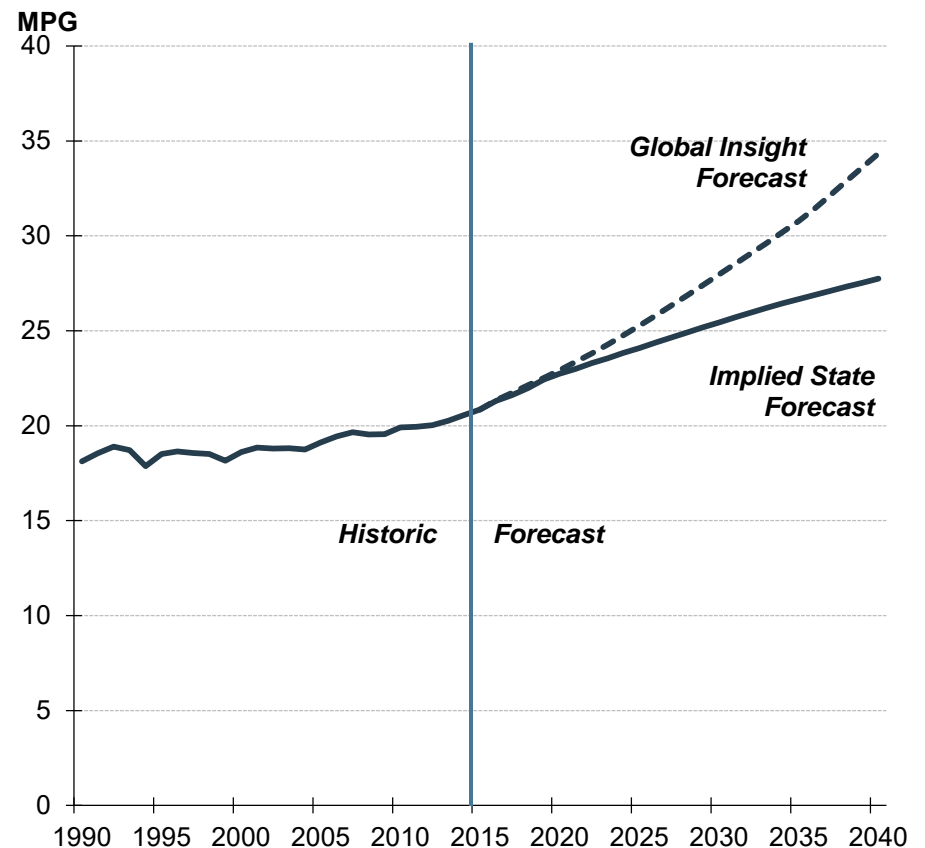
Implied State Forecast of Fuel Economy¹⁰

- The implied State forecast is for on-road fuel efficiency to steadily increase from 2015 levels of 20.9 mpg to 27.7 mpg by 2040 for gasoline vehicles.

Alternative Forecast

- The Global Insight forecast of on-road fuel efficiency shows fuel efficiency improvements of 34.3 mpg by 2040, which is in line with forecasts by the U.S. Energy Information Agency (EIA).

Historic and Forecast Fuel Efficiency
FY 1990 to FY 2040



⁹ “The talked-about 2025 CAFE standard — usually described as 54.5 mpg — amounts to a figure of 36 mpg Combined on a window sticker.” An excellent summary of how the CAFE standards apply to real world mpg can be found at <http://www.edmunds.com/fuel-economy/faq-new-corporate-average-fuel-economy-standards.html>.

¹⁰ The State provided forecasts of total VMT and fuel consumption that incorporate forecasts from Global Insight. The consulting team had to make additional assumptions to derive non-diesel VMT. When dividing the resulting non-diesel VMT by the fuel consumption, we arrived at a forecast of fuel efficiency “implied” by the estimates provided by the State.

The State forecasts declining fuel consumption—but the decline may be steeper, since this forecast may not fully account for fuel economy improvements.

State Forecast of Gasoline Consumption

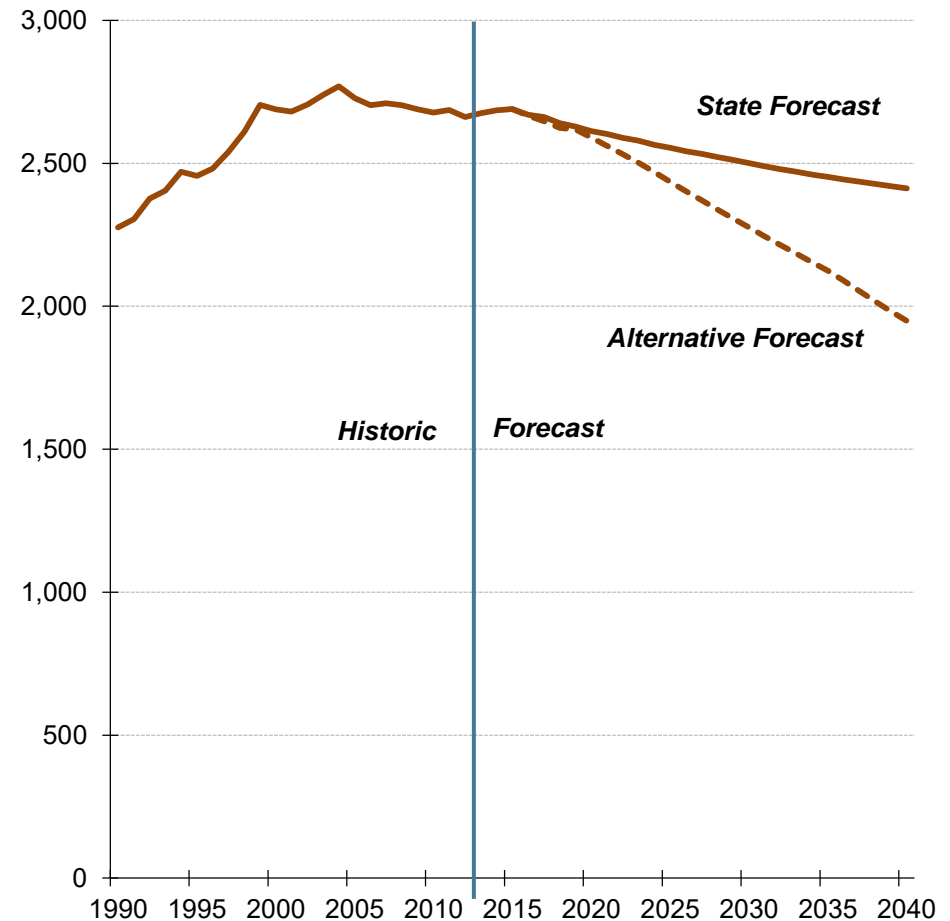
- Gasoline consumption has historically been uneven and reflects:
 - > Short-term changes in economic activity;
 - > Long-term changes in fleet fuel efficiency; and
 - > Changes in traveler behavior (e.g., transit use).
- The State forecasts indicates that 2015 will be the last year of positive growth, with the amount consumed in 2040 being 10 percent less than that consumed in 2015.
- This gas consumption forecast implies on-road fleet fuel efficiency of 27.7 mpg by 2040, which is below other forecasts.

Alternative Forecast

- The alternative forecast takes the State VMT forecast of non-diesel vehicles and divides it by fuel economy values from Global Insight. This results in an alternative forecast for gasoline consumption.

Historic and Forecast Gasoline Consumption
FY 1990 to FY 2040

Total Gas Consumption (Millions of Gallons)



The State forecasts a steady decline in gas tax revenue—but higher fuel efficiency forecast reflects an even greater decline.

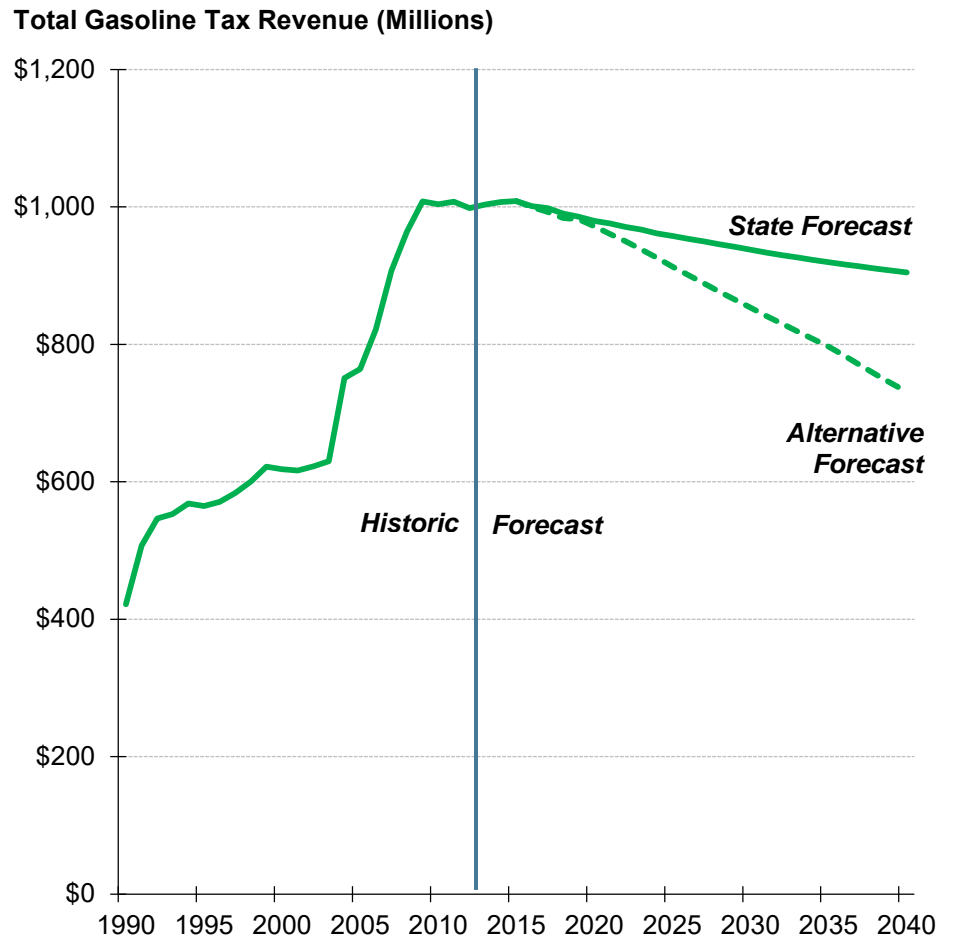
State Forecast of Gas Tax Revenue

- Gas tax revenue generally increased in the past due to VMT growth and flat fuel efficiency.
- Big increases from 2005 to 2010 are the result of two State gas tax increases (the 2003 “nickel” and 2005 Transportation Partnership program).
- The State forecasts revenue to remain flat between 2009 and 2016 before declining by approximately 10 percent throughout the remainder of the forecast period.
- The decline in gas tax revenue through 2040 is caused predominantly by slower growth in VMT and improvements in fuel economy.
- This forecast is based on the State forecast for fuel consumption, which implies MPG of 27.7 by 2040, which is below other forecasts.

Alternative Forecast

- Using the Global Insight forecast for fuel efficiency results in gas tax revenue that is 28 percent lower than the State forecast by 2040.

Historic and Forecast Gas tax Revenue
FY 1990 to FY 2040



Section 4b: Business Case Evaluation – Financial and Non-Financial Evaluation

For road usage charge concepts, we estimated eight categories of costs.

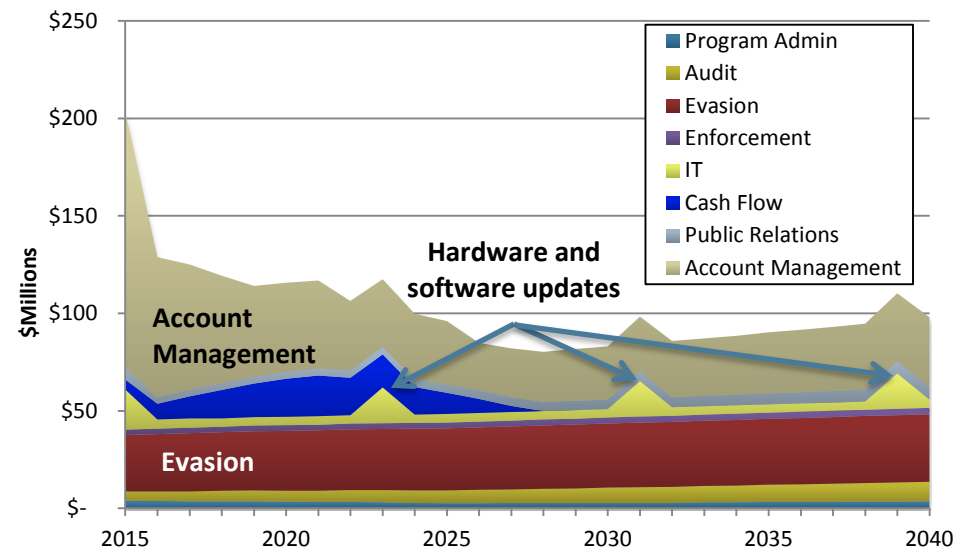
Cost Categories	
Program Administration	The cost of management salaries and overhead for the program.
Account Management	The cost of operating accounts for Principals paying road usage charges, including the cost of payment transactions.
Information Technology	The cost to state agencies of building and maintaining IT infrastructure sufficient to perform all road usage charge functions.
Evasion	The lost revenue due to evasion of road usage charges, which is computed as evasion minus funds recovered through audits and enforcement.
Collections	The cost to recover funds owed to the State through State collections processes.
Audit	The cost to investigate the possibility of fraud in a small subset of Principals.
Public Relations	Informing the public about the road usage charge program existence, purpose, requirements and alternatives.
Cash Flow	Short-term borrowing necessary to make up for the anticipated cash flow from the gas tax.

Details regarding assumptions and calculations related to these categories are contained in Appendix C.

Over two-thirds of the collection costs for road usage charging fall into two categories: account management and evasion.

- At right is an example of the cost components of collection for road usage charges, for one scenario that combines Concepts A, B, and C; the other concepts show similar trends.
- Account Management:
 - > The key driver is expected to be labor to process transactions.
 - > We expect these costs to decline over time as consumers opt for web-based account management and payment.
 - > Account management cost might be reduced through the use of private service providers. However, there are no guarantees that private companies would be willing to handle those transactions, or do so for little or no cost.
- Evasion:
 - > We assume a substantial loss due to evasion because people will have to make a conscious decision to pay the charge (as opposed to the gas tax, which they pay each time they refuel).
 - > Roadside enforcement and account audit processes may help, but the added cost of such efforts may not be worthwhile.

Estimated Annual Road Usage Charge Costs by Category



While we estimate evasion for the road usage charge concepts, we do not include evasion as a cost of gas tax collection. This is one area where we do not have an "apples to apples" comparison because we do not have good data for fuels tax evasion. However, various national studies, and a study done in Washington State, indicate a fuels tax evasion rate of roughly 2 percent of revenue.

The cost to collect the gas tax is estimated at 0.8 percent of revenue, but this does not include the cost of evasion.

Estimates of cost to collect the gas tax

- Preliminary analysis of DOL's 2011-2013 biennial budget suggests that the cost to collect the gas tax represents about 0.8 percent of gas tax revenue annually.^a
- We also reviewed literature related to the costs associated with administering the motor fuel tax system.
 - Dating back to at least the 1990s, studies have shown that motor fuel tax collection costs represent approximately one percent of the revenue collected.
 - A 2011 National Cooperative Highway Research Program (NCHRP) Report titled "Costs of Alternative Revenue-Generation Systems",^b the most robust research to date on the cost to collect the gas tax, supports the estimate of about one percent.

Costs of evasion are difficult to come by

- Various national studies, and a study done in Washington State, indicate fuels tax evasion rate of roughly 2 percent of revenue.

^a DOL is currently conducting a study to assess the State's gas tax collection costs. The results are anticipated to be available in December 2013 and will be incorporated into this report before it is finalized.

^b NCHRP Report 689, "Costs of Alternative Revenue-Generation Systems," Transportation Research Board, Washington DC, 2011.

Using the State forecasts of travel characteristics, we estimate road usage charging to yield up to \$2.1 billion more than the gas tax between 2015 and 2040.

- Concept A would have the biggest advantage over the gas tax: \$2.1 billion more net revenue on a discounted basis:
 - > Cost of collection plus evasion would be about 6.9 percent of expected revenue.
- Concept C would have a \$0.4 billion advantage over the gas tax:
 - > Cost of collection plus evasion would be about 12.7 percent of expected revenue.
- The combination of Concepts A, B and C would generate \$1.0 billion more than the gas tax:
 - > Cost of collection plus evasion would be about 9.7 percent of expected revenue.

VMT and Fuel Efficiency Based on State Forecast (27.7 mpg by 2040)

Concept Adoption Rates	Revenues (\$B)	Costs + Evasion (\$B)	Net (\$B)	Net Difference from Gas Tax (\$B)	Cost + Evasion as a % of Revenue ^a
Gas Tax	\$17.1	\$0.2	\$16.9	N/A	0.8%
A: Time Permit	\$20.4	\$1.4	\$19.0	\$2.1	6.9%
B: Odometer Reading	\$19.8	\$1.6	\$18.2	\$1.3	8.0%
C: Differentiated	\$19.8	\$2.5	\$17.3	\$0.4	12.7%
A+B	\$19.8	\$1.7	\$18.1	\$1.2	8.6%
A+C	\$20.1	\$2.0	\$18.1	\$1.1	9.9%
B+C	\$19.8	\$2.1	\$17.7	\$0.8	10.5%
A+B+C	\$19.8	\$1.9	\$17.9	\$1.0	9.7%

^a Gas tax value does not include evasion.

Using higher fuel economy forecasts, we estimate road usage charging to yield up to \$3.1 billion more than the gas tax between 2015 and 2040.

- Concept A would have the biggest advantage over the gas tax: \$3.1 billion more net revenue on a discounted basis:
 - > Cost of collection plus evasion would be about 6.9 percent of expected revenue.
- Concept C would have a \$1.5 billion advantage over the gas tax:
 - > Cost of collection plus evasion would be about 12.2 percent of expected revenue.
- The combination of Concepts A, B and C would generate \$2.0 billion more than the gas tax:
 - > Cost of collection plus evasion would be about 9.6 percent of expected revenue.

VMT Based on State Forecast, Fuel Efficiency Based on Global Insight Forecast (34.3 mpg by 2040)

Concept Adoption Rates	Revenues (\$B)	Costs + Evasion (\$B)	Net (\$B)	Net Difference from Gas Tax (\$B)	Cost + Evasion as a % of Revenue ^a
Gas Tax	\$16.1	\$0.2	\$15.9	N/A	Unknown
A: Time Permit	\$20.4	\$1.4	\$19.0	\$3.1	6.9%
B: Odometer Reading	\$19.8	\$1.6	\$18.2	\$2.3	8.0%
C: Differentiated	\$19.8	\$2.4	\$17.4	\$1.5	12.2%
A+B	\$19.8	\$1.6	\$18.3	\$2.4	7.9%
A+C	\$20.1	\$2.0	\$18.1	\$2.2	9.7%
B+C	\$19.8	\$2.0	\$17.8	\$1.9	10.3%
A+B+C	\$19.8	\$1.9	\$17.9	\$2.0	9.6%

^a Gas tax value does not include evasion.

The biggest reason we expect road usage charges to have a more favorable financial outcome than gas tax is our assumption about improved fuel economy.

- Average Washington fleet fuel economy is forecast to be 20.9 mpg in 2015:
 - > The implied State forecast is for this to improve to 27.7 mpg by 2040.
 - > Global Insight forecasts mpg to be 34.3 mpg by 2040.
 - > Future fleet fuel economy is uncertain, and past forecasts have been unreliable indicators of the future.
- Federal standards call for new cars to have a corporate average fuel economy (CAFE) of 54.5 mpg by 2025, which translates to an EPA sticker fuel economy of 36 mpg.
- The difference between these fuel economy forecasts has an enormous influence on the financial outcomes.

Projecting future vehicle fuel economy is a risky business. The recent history of such endeavors makes it clear that the chances of being very wrong are very high. In the late 1970s and early 1980s, a number of studies attempted to project fuel economy levels for automobiles and light trucks through 1990. Most of the studies overestimated fleet fuel economy levels by a substantial amount. Estimates for 1990 passenger cars ranged from approximately 30 to 40 miles per gallon (mpg), but the actual fuel economy level was 28 mpg; estimates for light trucks ranged from 20 to 30 mpg, compared with the actual 20 mpg (U.S. Department of Transportation, 1991).

Automotive Fuel Economy, HOW FAR SHOULD WE GO? Committee on Fuel Economy of Automobiles and Light Trucks, Energy Engineering Board, Commission on Engineering and Technical Systems, National Research Council, NATIONAL ACADEMY PRESS, Washington, D.C., 1992

There is considerable difference in the cost of collection between the three road usage charge concepts we evaluated.

- Concepts A and B are least expensive, and therefore generate the highest net revenue. We estimate the cost of collection plus evasion as follows:
 - > Concept A is about 7 percent of expected revenue;
 - > Concept B is about 8 percent of expected revenue;
 - > Concept C is between 12 and 13 percent of expected revenue; and
 - > The combination of Concepts A, B, and C is just under 10 percent of expected revenue.
- The costs of collection for the road usage charge concepts include evasion losses and costs of collections.
- All road usage charge concepts have significant startup costs—Concept A has the most significant startup costs.
- The cost of collection for the gas tax is estimated at 0.8 percent, but it does not include an estimate of evasion:
 - > Evasion is the one area of our analysis where we were not able to do an “apples to apples” comparison.

It will take several years for the net revenue of the road usage charge to exceed the revenue value of the gas tax.

- Two examples of the net cash flow comparisons:
 - > It will take eight years for the present value of the most extensive road usage charge concept—the combination of Concepts A, B, and C—to exceed the gas tax in a single year (Figure 1).
 - > For Concept B alone, it will take six years (Figure 2).
 - > In both cases, revenue declines are due to discounting of future amounts.

Figure 1 Comparison of Present Value (\$2014) of Annual Net Revenues – Combination of Concepts A, B and C

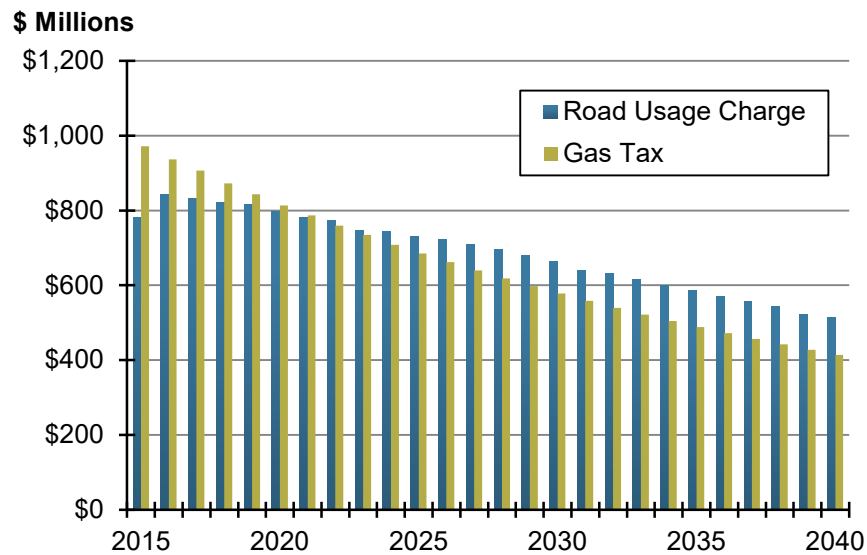
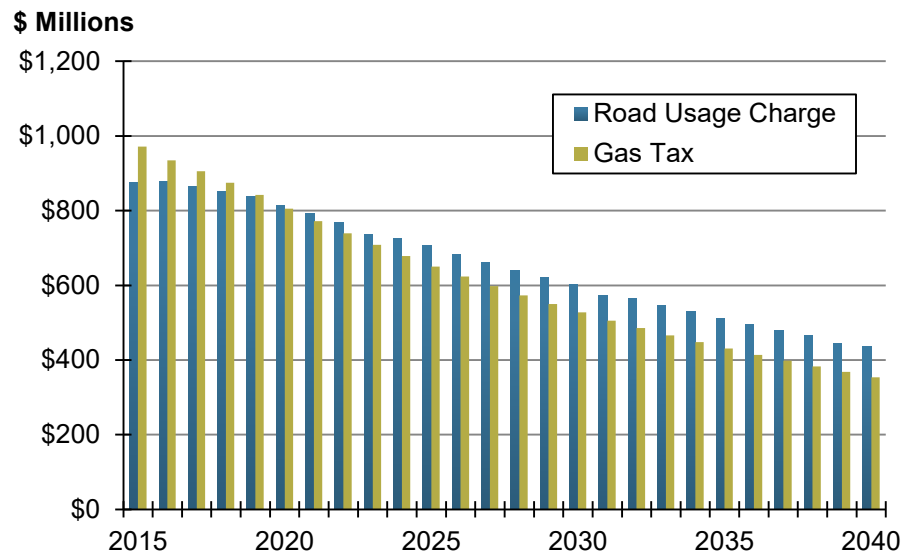


Figure 2 Comparison of Present Value (\$2014) of Annual Net Revenues – Concept B

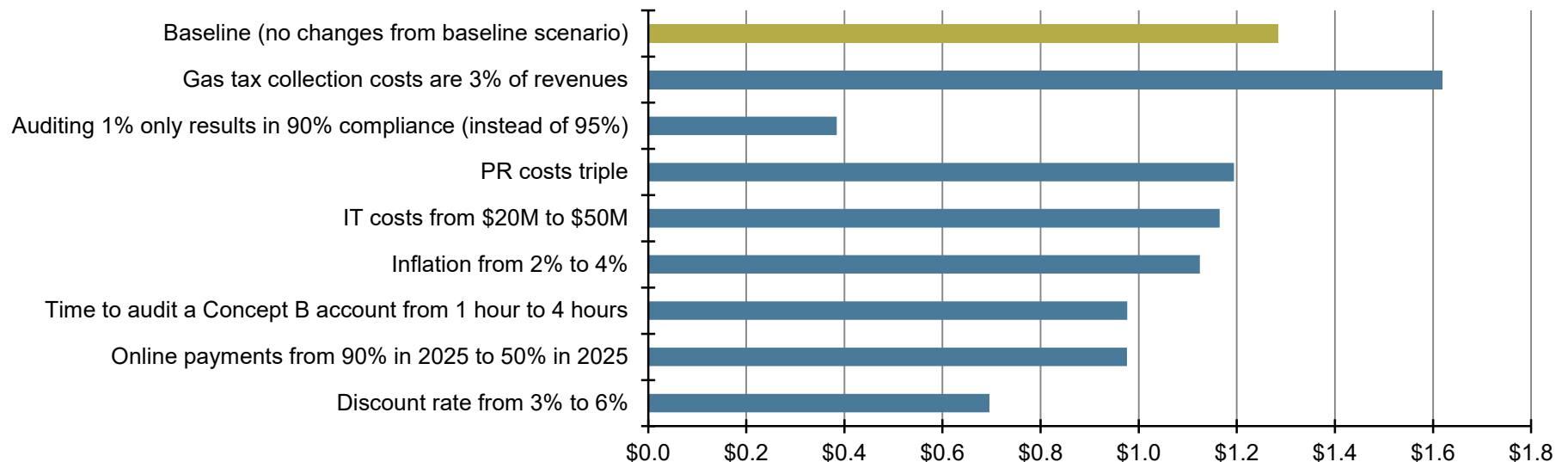


The financial evaluation could differ with alternative assumptions, so we conducted several sensitivity tests.

- Using Concept B, Odometer Reading, as a basis, we evaluated how the financial outcomes would change with a variety of different assumptions (see figure below).
- We found that none of these sensitivity tests changed the outcome that road usage charging would yield more net present value of revenue for Washington than the gas tax from 2015-2040, although in some cases the difference narrowed when we used the State forecast.
- The biggest influence came from our assumptions about compliance:
 - > Our evaluation assumed 95 percent compliance. Should that drop to 90 percent the difference in net revenue would be expected to drop to under \$0.4 billion over the forecast period.

Net Revenue Differences Between Gas Tax and Concept B Road Usage Charge

Sensitivity Tests



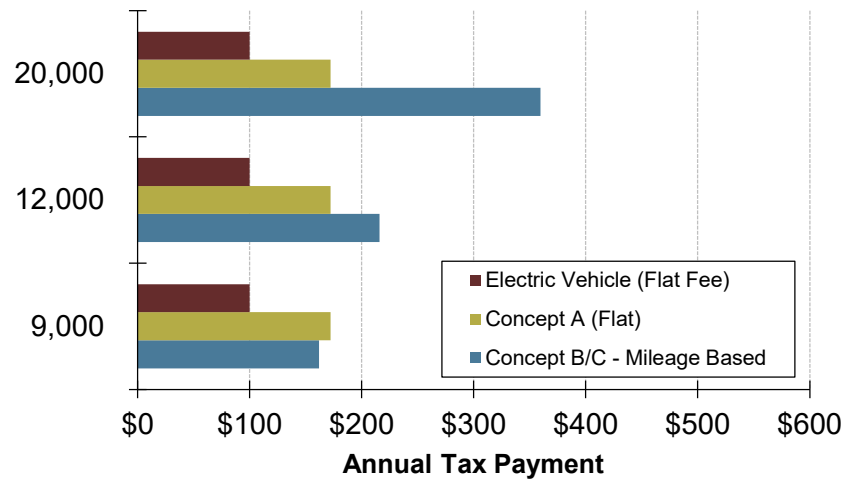
None of the concepts clearly outperforms the others when considering the non-financial evaluation criteria.

- Each has advantages and disadvantages. How important these advantages and disadvantages are to Principals will affect preferences for one concept over another – along with the financial consequences described earlier:
 - > Appendix A provides details of the evaluation.

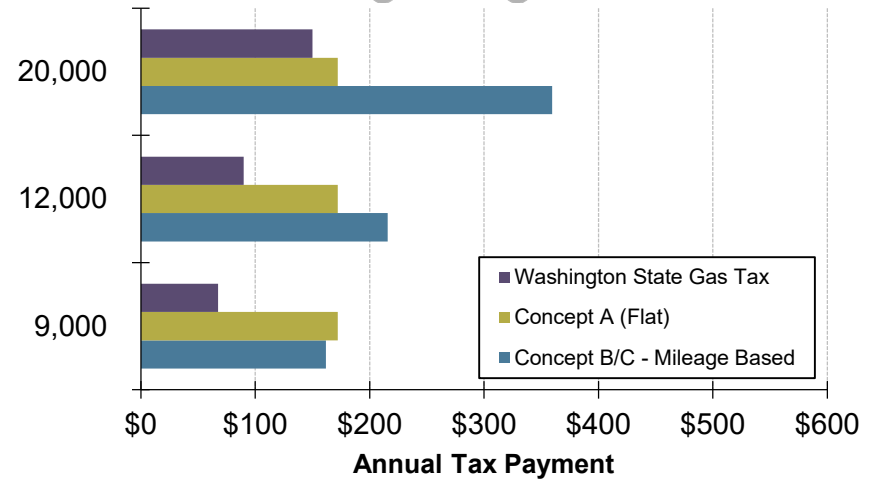
Concept	Advantages	Disadvantages
Gas Tax	<ul style="list-style-type: none"> • Simple. • Easy to enforce. • No privacy issues. 	<ul style="list-style-type: none"> • Long-term declining revenue source due to increased fuel economy and decrease in driving. • Not transparent. People recognize it as a tax, but are not aware of the amount, payment, or use. • Imperfect proxy for road usage in that it varies greatly according to the fuel economy of individual vehicles.
Concept A: Time Permit	<ul style="list-style-type: none"> • Transparent. • Relatively simple to use. • Easy to enforce. • No privacy issues. 	<ul style="list-style-type: none"> • No relationship to road use.
Concept B: Odometer Charge	<ul style="list-style-type: none"> • Transparent. • Relatively simple to use. • Easy to enforce. • Privacy not a significant issue (but Principals might object to mileage reporting). • Strong relationship to use. 	<ul style="list-style-type: none"> • No differentiation between driving in-state, out-of-state or on private roads.
Concept C: Differentiated Distance Charge	<ul style="list-style-type: none"> • Transparent. • Strongest relationship to use, recording miles driven in-state, out-of-state, or on private roads. 	<ul style="list-style-type: none"> • More complicated to use than others. • Perception of privacy infringement. • More difficult to enforce.

Illustrative Comparison of Annual Tax Payments by Vehicle Type and Annual Miles

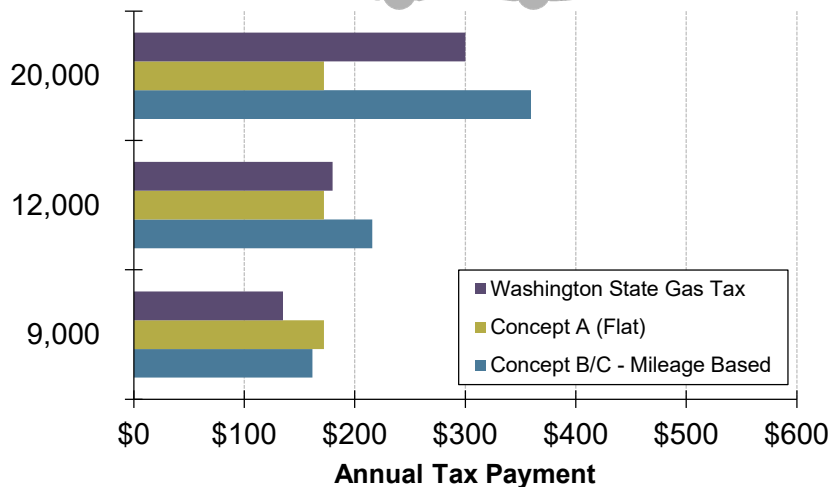
Electric Vehicle



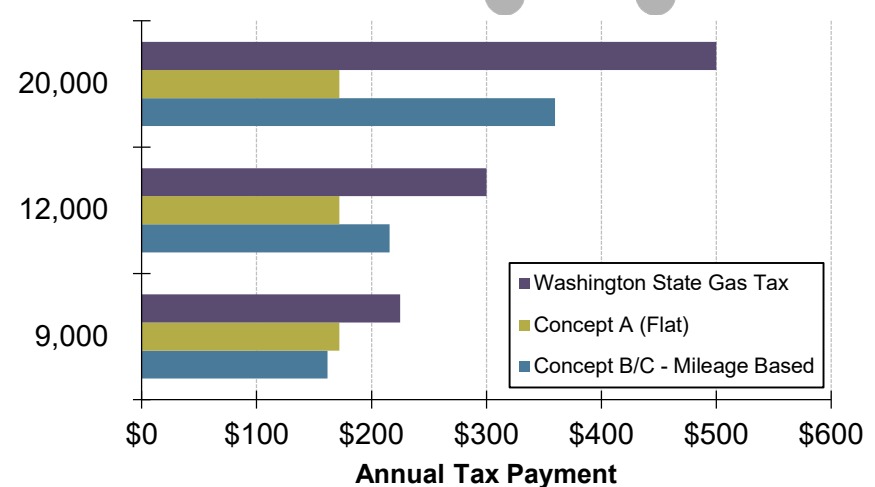
Hybrid (50 mpg)



Midsize (25 mpg)



Pickup/SUV (15 mpg)



How much gas tax increase achieves the same financial result as a road usage charge?

- We gain another perspective on the financial component of the business case by considering what gas tax increase you would be needed to achieve the same financial outcome as a road usage charge.
- The answer varies widely, and depends on:
 - > The road usage charge concept selected for comparison (we chose the combination of A, B, and C as it had the highest cost of implementation and lowest present value of revenue).
 - > Fuel economy forecasts (we show both the implied State forecast and the Global Insight forecast).
 - > How you define “same financial result,” and how you try to achieve it—we looked at two approaches:
 - Incremental gas tax increases every five years, starting in 2022, where the gas tax increase ranged from 9.1 cents per gallon by 2040 for the implied state fuel economy forecast by 2040 of 27.7 mpg, and 20.2 cents for the Global Insight forecast of 34.3 mpg.
 - A one-time increase in 2015 to achieve the same net present value by 2040, where the gas tax increase ranged from 2.2 cents for the implied state fuel economy forecast to 5.0 cents for the Global Insight forecast.

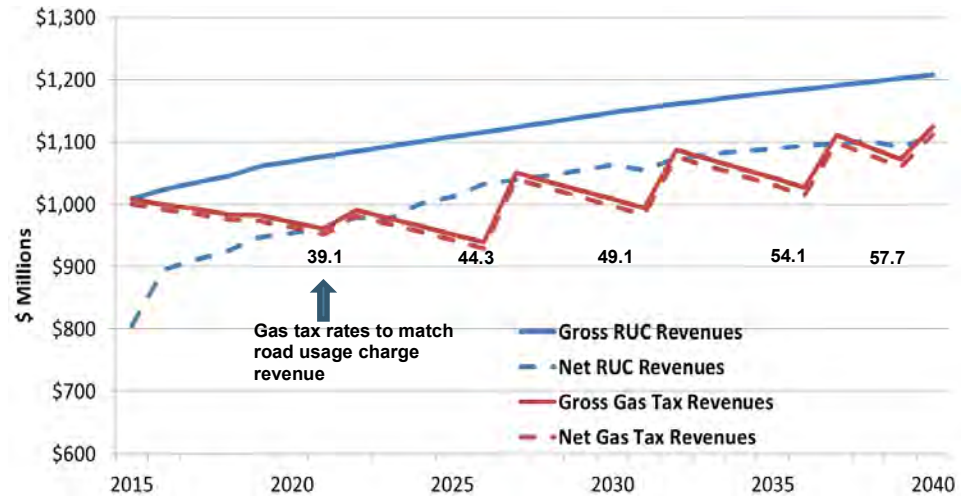
Gas Tax Needed by 2040 to Equal Net Road Usage Charge Revenue for Concept A+B+C

Fleet Fuel Economy Forecast by 2040	Gas tax increase (cents)	Gas tax amount (cents)
Incremental increases every 5 years, starting in 2022 – final amount of increase by 2040		
Global Insight Forecast (34.3 mpg)	20.2 cents	57.7
State Forecast (27.7 mpg)	9.1 cents	46.6
One time increase in 2015		
Global Insight Forecast (34.3 mpg)	5.0 cents	42.5
State Forecast (27.7 mpg)	2.2 cents	39.7

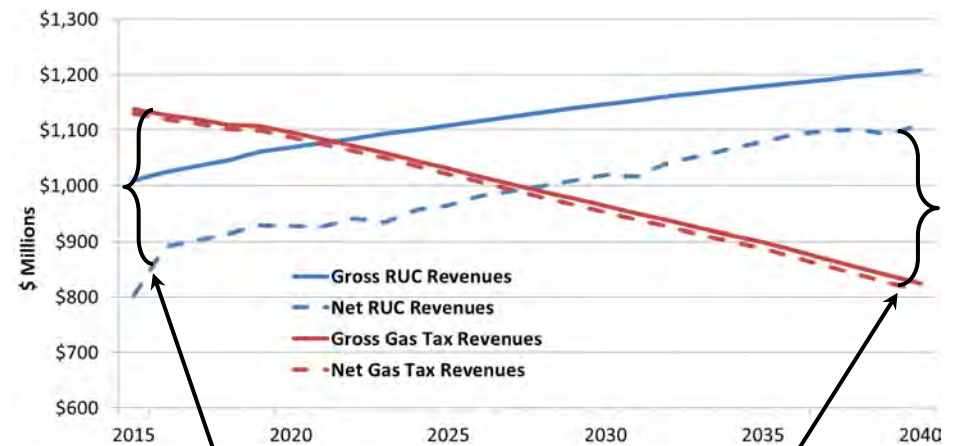
How much gas tax increase achieves the same financial result as a road usage charge? (continued)

- Cash flows for the two gas tax increase scenarios are at the right:
 - > They highlight the impact of the up-front investment cost of the road usage charge.
- A relatively small gas tax increase in 2015 (5 cents) can yield the same net present value as the road usage charge:
 - > But gas tax revenue will decline over time, requiring a large increase in 2040.
 - > The cash flow would be heavily front-loaded.
- Incremental gas tax increases would achieve the same present value result as a road usage charge, but not require a big increase in 2040.
- This comparison:
 - > Emphasizes the declining ability of the gas tax to generate a sustainable revenue stream without periodic increases.
 - > Emphasizes the up-front investment cost of the road usage charge approach
 - > Encourages an examination of the non-financial performance criteria as well.

Cash Flow Comparison-34.3 mpg with increases every five years starting in 2022



Cash Flow Comparison-34.3 mpg with a single increase of 5 cents in 2015



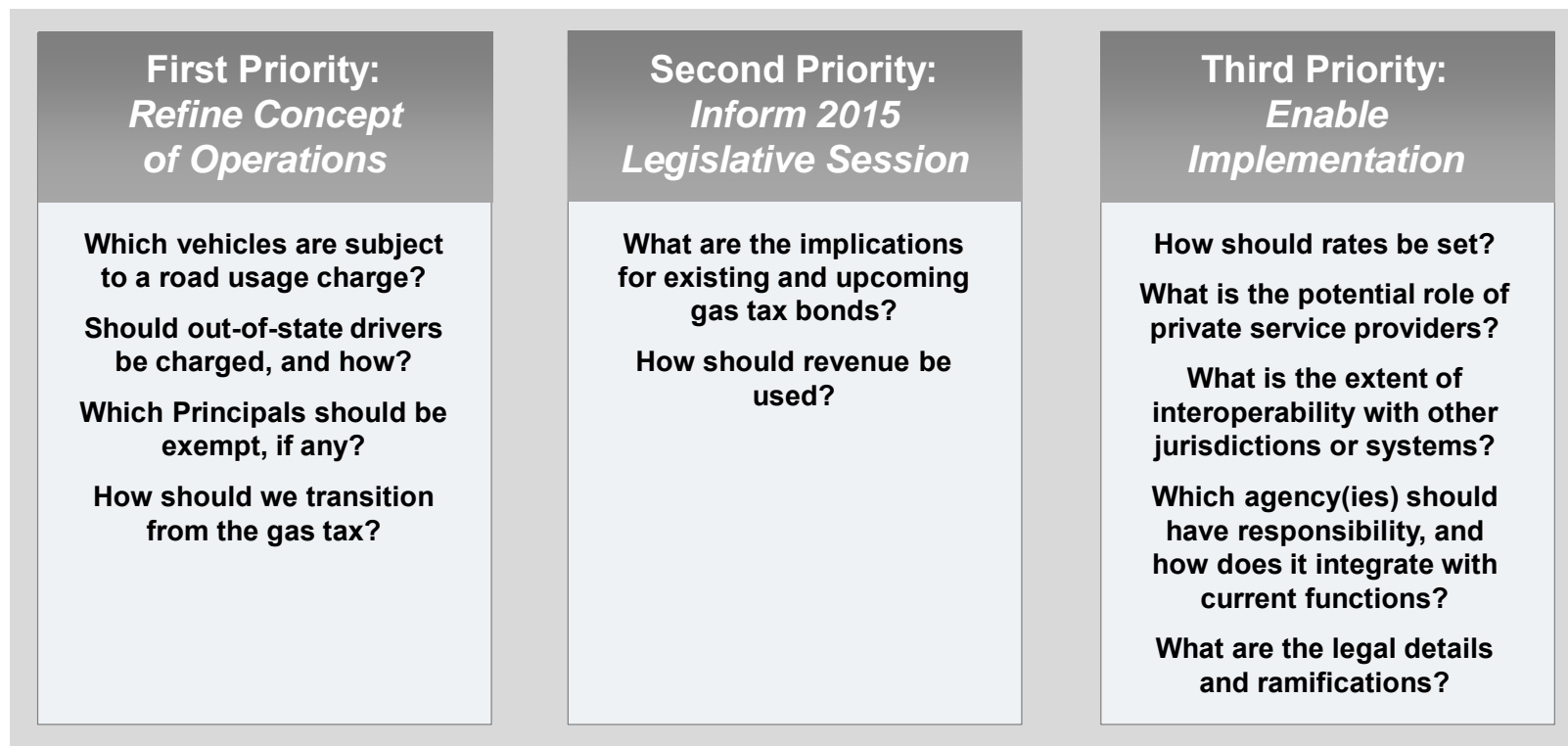
With a single gas tax increase, the gas tax yields considerably more than the road usage charge in the early years. These early year revenues are worth more than later year revenues on a present value basis

The gas tax would lag the road usage charge in later years. To get back on track after 2040, another increase would be needed, getting to the same level as in the sawtooth increases on the next page: 57.7 cents and 46.6 cents, depending on the fuel economy scenario

Section 5: Policy and Other Issues That Remain and Must Be Addressed Moving Forward

Although “the business case has been made,” there are numerous issues to resolve before road usage charging can move forward in Washington.

- These issues did not affect the initial Steering Committee finding that road usage charging was feasible in Washington, nor the finding in this report that the business case has been made:
 - > As a result, the Steering Committee put them in a “parking lot”—deferring research on these issues raised by the Steering Committee until a later time.
- Any of these issues could have significant bearing on important facets of a road usage charge system.
- The list of parking lot issues has been organized into categories based on when analysis and decision-making should occur.



First priority issues: refine the concept of operations.

Which Vehicles Should be Subject to a Road Usage Charge?

- Up until now, we assumed that only gasoline-powered, hybrids, and electric vehicles will pay the road usage charge—and not diesel vehicles.
- Additional analysis of the vehicle fleet and its future expected evolution can reveal whether this is an appropriate assumption or whether alternative approaches are preferable:
 - > The answer will affect both the revenues and costs of the road usage charge system as well as existing revenue mechanisms such as gasoline and diesel taxes.
 - > The answer will also affect the refined concept of operations for a road usage charge system.

Should Out-of-State Drivers be Charged, and How?

- Our business case evaluation assumed that out-of-state drivers would not be required to pay the road usage charge.
- This has implications for both revenues and costs. For example, the cost of collecting from out-of-state drivers could be substantial, and may not prove to be cost-effective.
- It will also have implications for public acceptability in communities near the State border.
- Direction on this issue will help define the concept of operations.

Who Should be Exempt?

- Exemptions from payment of the gas tax include current tribal members, transit buses, and school buses.
- So far, we have not factored these exemptions into our analysis. If it is necessary to extend these refunds to a road usage charge, there will be implications for the concept of operations.

First priority issues: refine the concept of operations (continued)

What are Various Approaches to Transition to a Road Usage Charge System, and Which Are Preferable?

- To simplify the analysis, the work to date has not accounted for transition in our policy recommendations or financial model, assuming a “big bang” start in 2015 in which all gasoline-powered vehicles begin paying a road usage charge, and the State discontinues its collection of the gas tax.
- Such a start carries significant political, programmatic, revenue, and technical risks, and it may be more desirable to gradually add drivers to the road usage charge system over a period of several years.
- However, a gradual transition would likely increase costs by operating two systems at once and other costs, such as paying out gas tax refunds or other offsets to road usage charge payers.

Second priority issues: inform the 2015 legislative session.

What are the Implications for Existing and Future Gas Tax Bonds?

- Many recently issued Washington State bonds have gas tax revenue pledges.
- We need to clarify whether additional revenue sources such as road usage charging can be used to service the bonds and, if not, whether refunding existing bonds is possible and the relevant implications (e.g., legal, financial) of doing so.

How Should Revenue Be Used?

- There seems to be a general expectation that road usage charge revenue would be used in the same way as the gas tax revenue.
- However, use of the gas tax revenue is governed by the 18th Amendment to the Washington State Constitution, which dedicates motor fuel tax collections to “highway purposes,” and by statutes that allocates funds by formula to different uses, such as counties¹¹ and cities and towns¹² for roadway programs that are not part of the State highway system.
- This raises the question as to whether that restriction should continue, either in statute or in the Constitution.

¹¹ RCW 46.68.120.

¹² RCW 46.68.110.

Third priority issues: enable implementation.

These issues can be deferred beyond 2015.

How Should Rates be Set?

- Our work to date assumed “gross revenue neutrality,” which is setting the rate for each operational concept based on achieving the same amount of revenue expected to be raised by the gas tax in 2015:
 - > These are arbitrary rates, based on the revenues that the gas tax generates.
- Other rate policies are possible, such as:
 - > Indexing for inflation; and
 - > Setting the rate based on budgetary needs.
- Other related topics include:
 - > Whether gas tax rates should be adjusted during a potential transition period.
 - > Whether rates should reflect environmental goals, such as reducing emissions, reducing congestion, charging by vehicle weights per axle, distinguishing between rural and urban driving, or differential rates for various road types.
- The rate-setting process will be established by the Legislature and the Governor, but it would be appropriate for the Steering Committee to discuss and make a recommendation on this important, complicated, and potentially contentious topic.

Potential Role of Private Service Providers

- We assumed that a road usage charge system would be run by a state agency and the continued use of Department of Licensing subagents to handle some road usage charge transactions.
- More extensive use of private service providers, in particular related to Concept C, should be explored.

Third priority issues: enable implementation (continued).

Extent of Interoperability with Other Jurisdictions or Systems

- Other jurisdictions are considering road usage charges, including Oregon and British Columbia.
- This presents both opportunities and constraints that need to be addressed.

Which Agencies Should Have Responsibility and Accountability and How Does a Road Usage Charge System Integrate With Current Functions?

- The simplified business case evaluation assumed that a Washington State agency would add road usage charging into its current functions:
 - > Further work is needed to address the specifics of account management, road usage charge management, compliance and enforcement, and overall program authority.
- Our operational assumptions include the expectation that road usage charging will be integrated in some way with vehicle registration, whether for building a registry of vehicles subject to road usage charges or actually providing a procedure and interface for assessing and collecting the charge. There are other processes with which integration is possible in the State, and it is even possible that a new process could be implemented to handle road usage charging.
- It may be desirable to coordinate IT upgrades for existing agencies to coincide with implementation of road usage charging, which would impact the transition toward road usage charges and the timeline of the business case.

Third priority issues: enable implementation (continued).

Legal Details

- Among the legal issues identified so far are:
 - > Distance Measurement Instruments. Odometers, GPS systems, cell phones or other devices may or may not qualify as legal measurement instruments, unless specifically recognized as such.
 - > Commerce Clause. The applicability of the Commerce Clause of the U.S. Constitution may need to be evaluated if special provisions are made to collect fees from out-of-state drivers.
 - > Enforcement. The enforcement mechanisms used to monitor drivers (e.g., cameras) may need to be legally recognized.
 - > Data Security. Data security standards may need to be consistent with existing regulations under the Washington State Public Records Act.

Public Outreach and Education

- Public communication prior to legislative debate will be key to get the public prepared for the switch to a road usage charge.

Section 6: Proposed Work Plan for FY 2015

The proposed work plan will address policy issues and develop a concept of operations to inform the 2015 Legislative session.

- The work plan has these objectives:
 - > Answer some of the “parking lot” questions that guide a specific concept of operations and to inform potential legislation.
 - > Create a concept of operations for a potential road usage charge system, and for a potential pilot or phased implementation plan.
- Considerably more work is needed to create a road usage charge system that is ready to implement, such as:
 - > Public education and outreach;
 - > Administrative design;
 - > System architecture and technical requirements;
 - > Interoperability with other systems;
 - > Interagency coordination;
 - > Detailed transition strategy; and
 - > Pilot implementation.
- A summary of work deferred until later stages is provided at the end of this section.

A concept of operations will reflect a specific road usage charge proposal.

- A concept of operations is a formal systems engineering document:
 - > It will define the entire operation of the road usage charging system from the perspective of the user.
 - > It is a detailed technical document that follows a specified industry-accepted format.¹³
- A concept of operations differs from the operational concepts developed in the current phase of work:
 - > It provides much more detail than an operational concept, and is sufficient to develop a requirements document:
 - This is a key step toward a pilot.
 - > It will expand upon the three operational concepts described in this report.
- A concept of operations generally contains:
 - > Policy background;
 - > Full statement of system goals and objectives;
 - > Description of system environment and constraints (e.g., external limitations to the system);
 - > List of participants and stakeholders, their interactions, and stakeholder responsibilities;
 - > Description of system components and high-level architecture (e.g., mileage recording, accounting, user account management); and
 - > Operational scenarios, including all the situations in which the system must operate (e.g., registering with the system, using the system (driving), canceling or changing vehicle registration).

¹³ We anticipate using guidelines from the Institute of Electrical and Electronics Engineers (IEEE 1362-1998).

The work plan includes these tasks.

Task	Purpose	Description
Task 1	Refine Policy Direction Addressing the Highest Priority “Parking Lot” Issues. Support the Legislature, the Commission, and the Steering Committee in establishing a road usage charge policy for Washington State.	<p><i>The following policy questions will influence the concept of operations and need to be addressed early:</i></p> <ul style="list-style-type: none"> ● Which vehicles should be subjected to a road usage charge? <ul style="list-style-type: none"> > Was our assumption that “all gas vehicles should pay” a good assumption? > What are the implications for costs? ● Should out-of-state be drivers be charged, and if so, how? ● Which Principals should be exempt, if any? ● How should we transition from the gas tax? <p><i>These policy questions are not critical for the concept of operations, but are important to resolve before implementation decisions are made:</i></p> <ul style="list-style-type: none"> ● What are the implications for existing and future gas tax bonds? <ul style="list-style-type: none"> > Work with the Commission, WSDOT and Office of the State Treasurer, with the analytical work by the Treasurer. ● How should revenue be used? <ul style="list-style-type: none"> > Organize and carry out a facilitated discussion with the Steering Committee to explore the issue, make policy recommendations and identify legal concerns.

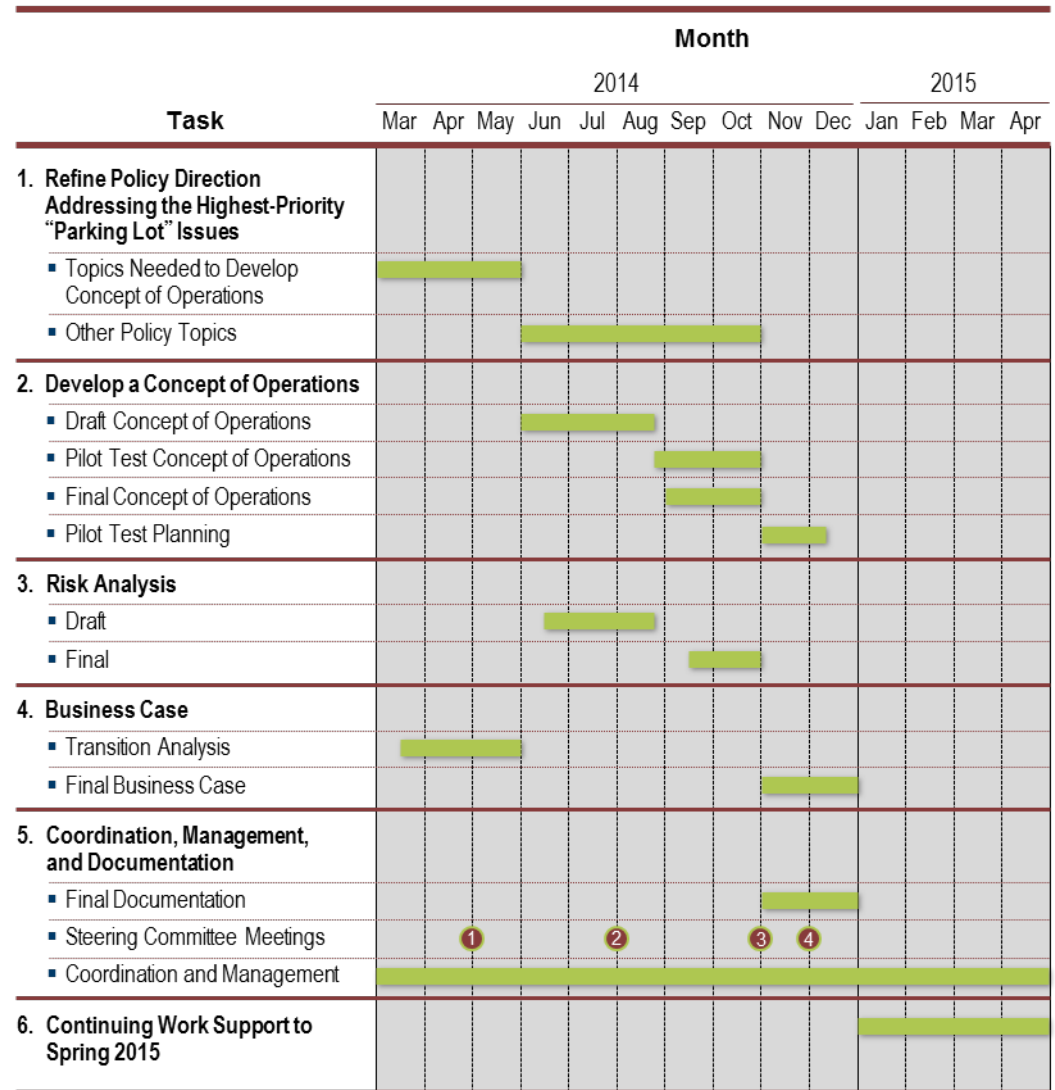
Task	Purpose	Description
Task 2	Develop a Concept of Operations. Define how system users will experience the system when driving and paying charges.	<ul style="list-style-type: none"> ● Develop a single concept of operations for Concept A+B+C that reflects the policy recommendations from Task 1. <ul style="list-style-type: none"> > Develop as if for a complete system, and then potentially create a limited version for use in a pilot. > Consider, at a very high level, potential transition approaches (with further detail deferred to later phases).
Task 3	Risk Analysis. Identify risks and potential mitigation measures to minimize adverse impacts and the costs of such impacts.	<ul style="list-style-type: none"> ● Develop an inventory of technical, operational, cost, communications, and policy risks and threats to the development and implementation of a road usage charge. ● Identify mitigation measures to alleviate uncertainty in the execution of the system.
Task 4	Business Case. Refresh the business case evaluation.	<ul style="list-style-type: none"> ● Update the simplified business case model with revised cost and revenue data based on decisions taken in Tasks 1, 2, and 3, including: <ul style="list-style-type: none"> > Initial recommendations on transition; > Updated information on the costs of gas and diesel tax collection (if possible); and > Possibly purchase data relating to the existing and future compositions of the fleet.

Task	Purpose	Description
Task 5	Coordination, Management, and Documentation.	<ul style="list-style-type: none"> ● Assume the following meetings: <ul style="list-style-type: none"> > Four Steering Committee meetings; > Two in-person staff/consultant meetings (one in advance of intermediate and one in advance of final report); > Joint Transportation Committee (JTC) briefing; > Governor briefing; and > Treasurer coordination meeting. ● Provide assistance to add a few survey questions to a Voice of Washington Survey (VOWS). ● Produce a final report that includes a work plan and budget for future work, potentially including a pilot test.
Task 6	Continuing Work Spring 2015.	This task establishes a budget to allow work to continue in the event that the Legislature decides to continue advancing development of a road usage charge (e.g., a pilot) in the spring 2015 Legislative session. It would allow work to continue without waiting for July 2015 when the State's new fiscal year begins.

We plan to work through 2014 to develop recommendations in time for the 2015 legislative session.

- The first three months are focused on:
 - > Policy topics needed to develop the concept of operations; and
 - > Initial evaluation of transition approaches.
- While we develop the concept of operations, we will continue to work with the Steering Committee to explore other policy topics, such as gas tax bond implications and the use of revenue.
 - > We will address concepts of operations for an ultimate system and a pilot test at the same time.
- Risk analysis will be developed as we develop the concept of operations.
- We will re-evaluate the business case once the concept of operations is complete.
- Recommendations and final documentation will be done by late Fall 2014.

Road Usage Charge Schedule



We anticipate the following tasks will be needed after the completion of this work plan to bring about road usage charge implementation.

Task	Description
Administrative Design. Provide recommendations relating to the administrative functions of a road usage charge system.	<ul style="list-style-type: none"> Identify and evaluate the administrative functions of the operational concepts with an efficient and effective organizational design for the delivery and operation of the proposed system.
System Architecture and Technical Requirements. Begin to develop the system architecture and detailed technical requirements of the technology so that the technology can be tested and procured.	<ul style="list-style-type: none"> Develop: 1) preliminary system architecture, which is the basic framework for how the system will operate; and then 2) determine technical requirements, which include technology and data flows.
Interoperability with Other Systems. Provide guidelines for road usage charging interoperability with other similar systems such as tolling, diesel fuel taxes, and road usage charges in other jurisdictions.	<ul style="list-style-type: none"> Assess interoperability with State revenue systems, other states, and countries to reduce redundancy and/or leverage existing systems. This ensures that a road usage charge system does not unduly add to the compliance burden of users and adds value to existing back-office operations.
Transition Strategy. Develop a manageable strategy to transition from the gas tax to a road usage charge, potentially in phases.	<ul style="list-style-type: none"> Finalize approaches to transition from the gas tax to a road usage charge, including fleet phase-in; technology phase-in; administrative phase-in; and state/interstate/international phase-in.
Pilot Implementation.	This is procurement, testing, recruitment, implementation and evaluation of a test system.
Public Participation and Outreach.	Public participation and outreach could include focus groups, more extensive surveys, open public meetings, websites, press releases, brochures, preparing materials for spokespeople to do interviews and presentations at community groups.



A-20

**RUC ASSESSMENT: FINANCIAL & EQUITY
IMPLICATIONS FOR URBAN & RURAL DRIVERS**

Washington State Transportation Commission // January 2015

 **WA RUC**

Road Usage Charge Assessment

Financial and Equity Implications for Urban and Rural Drivers





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Executive Summary

Study Process

The 2014 Legislature directed the Washington State Transportation Commission (WSTC) to undertake a study of the urban and rural financial and equity implications of a potential road usage charge (RUC) system in Washington (ESSB 6001, Sec 205 (7)). The study was to be completed within existing funds. The directive in the 2014 Supplemental Transportation Budget states:

“(7) Within existing resources, the commission shall undertake a study of the urban and rural financial and equity implications of a potential road usage charge system in Washington. The commission shall work with the department of transportation and the department of licensing to conduct this analysis. For any survey work that is considered, the commission should utilize the existing voice of Washington survey panel and budget to inform the study. The results must be presented to the governor and the legislature by January 15, 2015.”

This study compared estimated annual payments for Washington State personal light-duty vehicles using current fuel tax rates with estimated annual payments under a hypothetical road usage charge. The study achieved this via a three part analysis: 1) Created a model to compare estimated fuel tax payments using current fuel tax rates with estimated road usage charge payments for light duty vehicles registered to urban and rural residents in Washington State 2) a household inventory and mileage survey of vehicles via the Voice of Washington State (VOWS) survey panel and 3) the use of Washington labor data on commuting patterns.

It is important to note that the *fuel economy and vehicle miles traveled (VMT) allocation model* analysis is intended simply to serve as an illustration of a hypothetical change in the manner in which driving is taxed and the resulting effect on users. In conducting the analysis, staff assumed that the amount of gross revenue generated from the hypothetical road usage charge would be the same as the fuel tax gross revenue for calendar 2014. However, it should be noted that the policies ultimately adopted by the Legislature and the Governor could deviate from a gross revenue neutral outcome which could thus create different impacts on urban and rural drivers than is demonstrated in this study.

Key Findings

Fuel Consumption and VMT Allocation Model

The comparison between rural and urban extended to drivers and households. **The modeling found that the tax burden for each group does not appear to significantly change with a switch from fuel taxes to a hypothetical road usage charge.**

The results of the Fuel Consumption and VMT Allocation Modeling effort show that with road usage charges, rural drivers would benefit slightly from the change and urban drivers would likely pay slightly more than they do in fuel taxes. The model produced this result because it found that rural residents tended to drive less fuel efficient vehicles and more miles per year than those residents living in an urban area, on average.

Under a hypothetical RUC, the Fuel Consumption and VMT Allocation model shows that the greatest impact of the change relates to factors other than whether the drivers live in urban or rural areas. The factors that have a strong effect relate to characteristics of the vehicle the driver uses. For example, the model finds that drivers with newer and more fuel-efficient vehicles would pay more in road usage charges than they would pay in fuel taxes.

Voice of Washington State (VOWS) Survey

The Voice of Washington State (VOWS) Survey analysis was not designed to yield a conclusion one way or the other regarding the urban and rural impacts of switching to a hypothetical road usage charge. Instead, it was designed to gather household vehicle information and assess perceptions of vehicle miles driven and miles per gallon. As is the case with all surveys, the responses reflect the respondent's perceptions. **The VOWS survey results indicate significantly higher perceived miles driven for rural over urban drivers/households, but indicate no significant differences between urban and rural in regards to perceived fuel economy of vehicles owned.**

Commuting Patterns of Washington Residents

In order to examine the differences between rural and urban residents, the commute distances for rural and urban workers in Washington State were examined. The US Census OnTheMap national database has commuting patterns for Washington state residents for years 2002-2011.

Examining the commuting patterns over time reveals a trend that **more individuals are commuting longer distances over the past ten years for both urban and rural commuters.** The percentage of urban commuters with a one-way work commute to their primary job of less than 10 miles is higher, at 54.4 percent, than that for rural commuters, at 42.6 percent, in 2011.

The opposite is true in the longest commute category of greater than 50 miles. More than 20 percent of rural commuters drive more than 50 miles, one way, to work, versus only 9 percent of urban commuters. This data supports the observation that rural residents have longer work commutes than urban residents.

Evaluation of the Impact of a Road Usage Charge

Urban versus Rural Drivers

Project History

In 2012, the Washington State Legislature directed the Washington State Transportation Commission (WSTC) to undertake an assessment of a road usage charge (RUC) as a possible replacement for the fuel tax. The WSTC has conducted the assessment in close cooperation with the Washington State Department of Transportation (WSDOT), and with guidance from a multi-stakeholder steering committee. The WSTC found that a RUC was indeed feasible.

In 2013, the Legislature and Governor directed the RUC work to continue, requesting the WSTC and the RUC Steering Committee to determine if there is a business case to be made for a road usage charge in Washington State. In response, the WSTC and the RUC Steering Committee reported that there appeared to be a business case for a road usage charge as an alternative, sustainable, long-term revenue source. The Commission estimated that such a system would yield \$2.1 billion to \$3.1 billion more in revenue than the current fuel tax system over the period 2015-2040.

In 2014, the Legislature directed the WSTC to continue the RUC work, requiring a work plan that included:

- The refinement of the initial policy analysis and development;
- A concept of operations; and
- An updated financial analysis

To date (December 2014), the WSTC has completed this work.

The 2014 legislative direction also required the evaluation of potential impacts of a road usage charge, with respect to urban and rural financial and equity implications. This report specifically addresses this directive.

Background

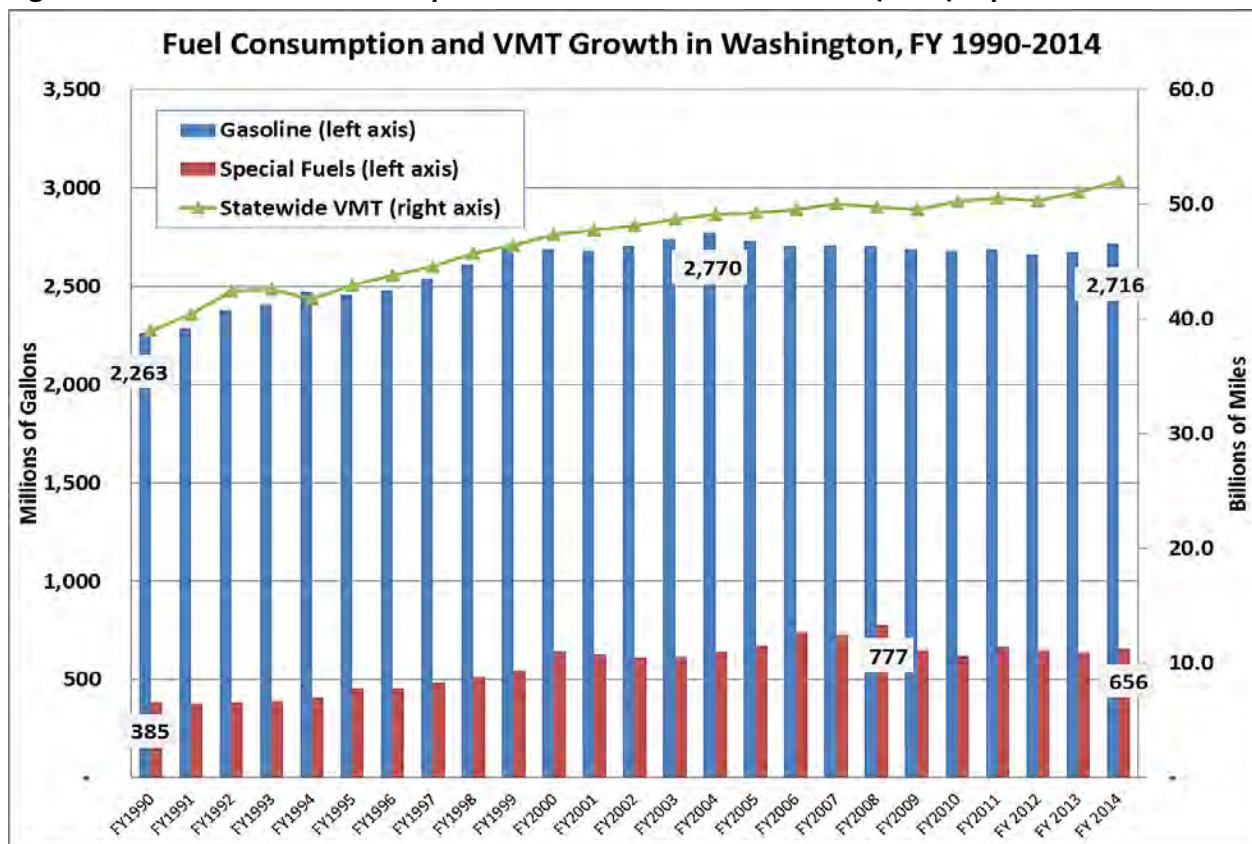
This assessment begins with building an understanding of the factors contributing to the flattening in fuel consumption – and therefore fuel tax revenues – in Washington State. These factors provide context to the analysis of urban and rural driver trends, therefore informing the assessment of the urban and rural financial and equity implications of a potential road usage charge.

Since the mid-2000's, the tax base for the fuel tax – consumption of gasoline and special fuel (i.e., mostly diesel fuel) – has stagnated, relative to the preceding period. Several factors impacted fuel consumption, including a historically substantial economic recession, an

apparent change in consumer transportation mode choice preferences, federal adoption of higher Corporate Average Fuel Economy (CAFÉ) standards for the first time since the 1980's, technological improvements in vehicle motor efficiency, more telework opportunities, and an apparent change in consumer preferences for more fuel efficient vehicles. At the same time, the amount of vehicle miles traveled (VMT) has also appeared to stagnate for some of the same reasons as the fuel consumption changes.

Figure 1 depicts these trends in Washington State. From fiscal year (FY) 1990 to 2004, consumption of gasoline increased, growing at an average annual rate of 1.5 percent. Overall, total fuel consumption (gasoline and special fuels) also increased, growing at an average annual rate of 1.8 percent. However, from FY 2004 to 2014, consumption of gasoline decreased, changing at an average annual rate of -0.2 percent, while overall fuel consumption was nearly stagnant, growing by an average annual rate of just 0.1 percent. As noted in Figure 1, the high points for gasoline consumption (2,770 million gallons) and special fuels consumption (777 million gallons) occurred in FY 2004 and FY 2008, respectively. Looking at statewide VMT growth from FY 1990 to 2004, the average annual growth rate was 1.7 percent, similar to the growth in fuel consumption. However, VMT growth from FY 2004 to 2014 was slightly more positive than fuel consumption growth, at an average annual rate of 0.6 percent. More detail about fuel trends can be found in the Road Usage Charge business plan.

Figure 1. Historical Fuel Consumption and Vehicle Miles Traveled (VMT) reported



Study Approach and Assumptions

To evaluate the potential urban and rural impacts of a road usage charge, with respect to financial and equity implications, the WSTC assembled a staff work group representing the Washington State Transportation Commission, Department Of Licensing, Department Of Transportation, and the Transportation Committees of the Legislature. The staff work group selected a three-prong approach to conduct the evaluation:

1. Fuel Consumption and VMT Allocation Model: Evaluate the differences in tax impacts of a hypothetical change to a road usage charge from the current fuel tax on urban and rural drivers, based on the household locations where the vehicles were registered (see Appendix C) and results from the 2009 National Household Travel Survey.
2. Voice of Washington State (VOWS) Survey: Use the VOWS Survey panel maintained by the Commission to inventory vehicles by household and gain an understanding of perceived miles driven and miles per gallon of each vehicle owned.
3. Commuting Patterns of Washington residents: Investigate a portion of driving activity on roads in urban and rural areas using U.S. Census Bureau by the Bureau of Labor Statistics (BLS) data for Washington State on commuting patterns.

The body of this report describes the approach and findings from the three prongs. The appendix contains detailed descriptions on assumptions, methodologies, and detailed findings for each of the three prongs.

Please note that the **Fuel Consumption and VMT Allocation Model** and VOWS survey yielded different results for several of the same major driving activity indicators. However, the staff study group concluded that with an understanding of the approaches, methods, and biases, the differences were explainable. A comparison of key results and of the approaches, methods, and biases are included after the Commuting Patterns results on page 12 in this report.

Fuel Consumption and VMT Allocation Model

The staff group evaluated a hypothetical road usage charge (RUC) by estimating the dollar impact to the taxpayer of switching to such a road usage charge from the current fuel tax. The model focused only on personal vehicles. No vehicles registered to businesses or government agencies were included in the analysis. This allowed for a comparison to the national household survey data, and to the VOWS survey results.

To estimate the impacts, staff developed a vehicle-based model coupled with vehicle miles traveled assumptions to simulate distributional differences in travel, fuel consumption, and tax or fee payments. Staff developed this model using several data sources: data from the Department of Licensing (DOL) Vehicle Headquarters System covering the personally owned vehicles in the Washington active light duty vehicle fleet; 2011-13 data from the Washington

Department of Transportation Highway Performance Monitoring System; U.S. Environmental Protection Agency fuel economy estimates for 1984-2014; and the 2009 National Household Travel Survey.

The model was based on, for each household vehicle in the state, an estimate of annual vehicle miles of travel (VMT) and an estimate of fuel economy associated with the vehicle. Staff merged the DOL vehicle database with EPA estimates for fuel economy estimates for all vehicle types and then utilized the national household travel survey results to estimate vehicle miles traveled for all light duty vehicles in Washington State. The model estimated the fuel consumption for each vehicle by dividing the VMT by the fuel economy. To obtain a RUC estimate, staff applied a single RUC rate to the vehicle's VMT estimate. Staff determined the RUC rate by assuming that the gross revenue yielded under the RUC scenario would be the same as under fuel tax for FY2014; this is referred to as a "gross revenue neutral" scenario.

In the process, the staff group also evaluated the financial impacts to drivers of different vehicle types, of different vehicle ages, and of vehicles of different fuel economy. The staff group also explored the distributional impacts by county.

See Appendix A for a full description of the fuel consumption and VMT model and detailed findings.

Key Findings:

- The "average" household-based light-duty vehicle fuel economy for June 2014 is estimated at 19.5 mpg.
- The modeling indicates that rural drivers on average drive more miles per year than urban drivers, rural drivers consume more fuel per year than urban drivers, and rural drivers on average pay more in fuel taxes per year than urban drivers. See Table 1.
- For calendar year 2014, the rural light duty vehicle drivers would have paid slightly less in road usage charges than they did in fuel taxes (about \$4 less per year). Meanwhile, urban light duty vehicle drivers would have paid slightly more (about \$2 more per year).
- The model found that there was a great range of potential impacts to drivers of vehicles based on certain characteristics. Drivers of highly fuel-efficient "hybrid" cars, for example, could be expected to pay more than two times as much as that paid at the current fuel tax rate (37.5 cents). On the other hand, drivers of older, less fuel-efficient pickup trucks could be expected to pay a third less than under the current fuel tax rate.

The Fuel Consumption and VMT Allocation Modeling approach used for this analysis suggests a change from the fuel tax payments to road usage charge payments would have *very little effect on the amount of tax paid by rural or urban drivers, on average*. As described, this is based on a gross revenue-neutral scenario selected for modeling June 2014 light-duty household-based

vehicle data, with rates set at the current fuel tax rate of \$0.375 per gallon, and a road usage charge rate set at \$0.0192 per mile.

**Table 1. (Excerpt from Table 5, Appendix A)
Comparison of a Fuel Tax with a Hypothetical Road Usage Charge – Calendar Year 2014**

<i>Comparison Basis:</i>	Average Annual:				
	VMT (miles)	Fuel Consumed (gallons)	Fuel Tax Paid (\$, Current Law)	Road Usage Charges (\$, Hypothetical Scenario)	Impact of Change to Hypothetical Scenario (\$)
<i>By Geography</i>					
Rural	9,288	484	\$ 182	\$ 178	(\$ 4)
Urban	8,611	436	\$ 163	\$ 165	+ \$ 2

Model data sources include June 2014 DOL VHS data, EPA fuel economy estimates for 1984-2014, 2011-13 WSDOT HPMS, and the 2009 NHTS.

Rural drivers would likely pay a few dollars less per year in road usage charges, and urban drivers a couple dollars more, on average. This is because, while the model finds that rural drivers drive more miles annually than do urban drivers, the rural based-vehicles are not as fuel efficient on average and so consume even more fuel, and the rural drivers thus pay even more fuel tax, than urban vehicles and urban drivers do. The greater mileage means that the rural drivers would indeed have to pay more in road usage charges than urban drivers, but this is more than offset by the fuel tax savings for the rural drivers, relative to that for urban drivers.

Impacts of the change from fuel taxes to hypothetical road usage charges on drivers in other vehicle type categories are worth noting: drivers of cars would tend to pay more in road usage charges; drivers of SUVs, pickup trucks, and vans would tend to pay less. Drivers of newer and more fuel-efficient vehicles would tend to pay more; those of older and less fuel-efficient vehicles, less. *See Table 5 in Appendix A for more information.*

Voice of Washington State (VOWS) Survey

The Washington State Transportation Commission (WSTC) conducted a statewide survey using the Voice of Washington State (VOWS) survey panel to inform the WSTC’s RUC urban/rural impact analysis. The WSTC designed the survey to help better understand the makeup of our state’s residential vehicle fleet and residents’ usage of our roads and highways, from the survey respondent’s perspective.

The survey gathered household data on each survey respondent’s total number of vehicles, total miles driven per year, and the proportion of in-state, out-of-state, and off-public road driving. The survey asked specific questions about characteristics of each household vehicle (up to six vehicles), including: make/model, year, engine type, transmission, miles per gallon, and miles driven. Five thousand six hundred and thirty eight (5,638) surveys were completed out of the 30,000 active members of the statewide Voice of Washington State (VOWS) panel. The surveys were weighted by age within a county, and the counties were weighted by population

in proportion to the state total. The weighting by age within a county was done to address under reporting by the younger age ranges.

See Appendix B for further details on the VOWS survey results.

Key Findings:

Household Findings

Statewide, the reported average number of vehicles per household is 2.2 (excluding motorcycles/motorhomes)

- Rural areas have the highest reported vehicle average with 2.7 vehicles per household, followed by suburban areas (2.3 vehicles), and urban areas (1.7 vehicles).

Survey responses indicate that the average household drives 17,742 miles per year

- Rural area respondents report the most driving: the average household drives its vehicles 22,243 miles per year. This is followed by suburban households (18,368 miles) and then urban households (13,206 miles).

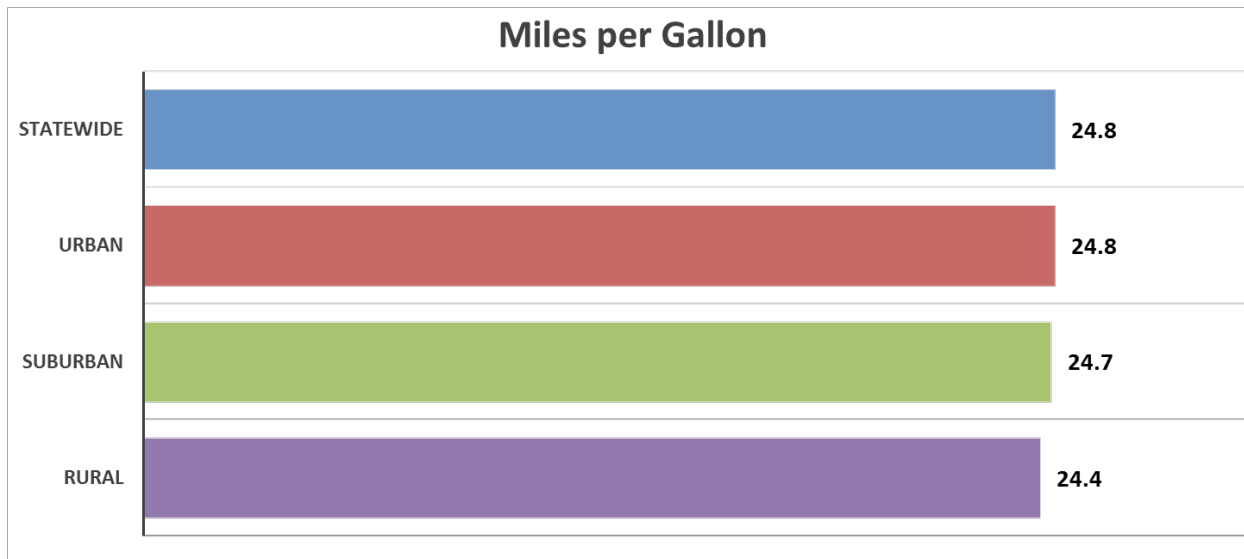
Survey respondents indicate that the vast majority (86 percent) of driving is done in state

- Responses indicate that households in rural areas are twice as likely as urban/suburban households to drive on non-public roads, although the overall percentage is still quite small at 4 percent.
- Responses indicate that households spend 10 percent of their driving outside of Washington State.

Statewide, the average fuel economy reported for all vehicles a household owns is 24.8 MPG (See Figure 2 on following page.)

- Responses indicate that most households with a vehicle own a Gas only vehicle, 6 percent own a Hybrid, 1 percent owns an Electric vehicle, and 9 percent own a Diesel vehicle.
- Survey respondents in urban, suburban and rural areas reported little difference in their combined average MPG

Figure 2. Perceived average miles per gallon, of a household, reported by VOWS respondents

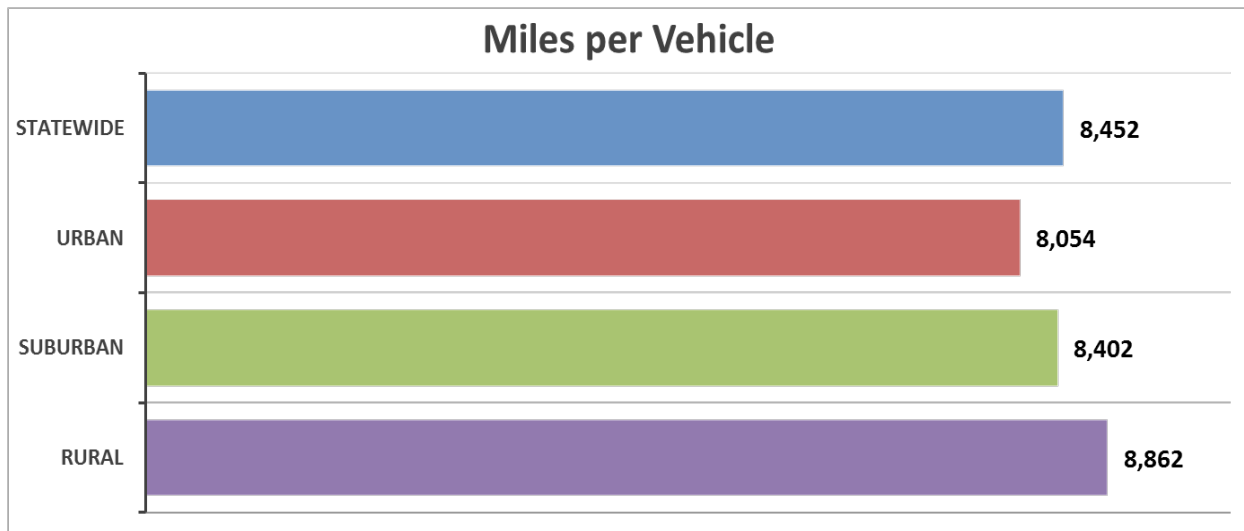


Vehicle Findings

Survey respondents report driving an average of 8,452 miles per vehicle per year (Figure 3)

- Residents in rural areas reported driving an average of 8,862 miles per vehicle
- Residents in suburban areas reported driving an average of 8,402 miles per year
- Residents in urban areas reported driving an average of 8,054 miles per year

Figure 3. Perceived Average miles per Vehicle reported by VOWS respondents



Commuting Patterns of Washington Residents

Commuting to work is one of the primary uses of our "road" network. As such, the staff group decided to evaluate actual commuting patterns in Washington State through the US Census *OnTheMap* dataset. The OnTheMap tool, which is based on historical commuting data from 2002 through 2011, allows the user to calculate one-way distances between employees' home addresses and employment locations. The tool allows the user to categorize commute trips into four distance categories: less than 10 miles, 10 to 25 miles, 25 to 50 miles, and greater than 50 miles.

The staff group investigated the state of Washington commuting patterns by county with workers' home addresses as the determining factor in classifying the worker as urban or rural. The staff group mapped each urban or rural area for each county in the state in conjunction with the US Census commuter data. Then staff summarized the commuter distances for all residents in the rural and urban areas in the state utilizing WSDOT and Federal Highway Administration definitions of rural and urban. In 2002, there were 1.8 million commuters (75.7 percent of total) on urban roads and 0.57 million commuters (24.3 percent of total) on rural roads. Ten years later, commuters on urban roads rose to 1.98 million (75.3 percent of total) and commuters on rural roads rose to 0.65 million (24.7 percent of total).

See Appendix D for further details.

Key Findings:

On average, Washington residents over time have seen a longer commute distance between 2002 and 2011

- The commuters on urban roads with the shortest commute distance, less than 10 miles, saw a decline in their percentage from 58.6 percent in 2002 to 54.4 percent in 2011.
- All other longer commuting distance categories saw their shares rise with the longest commuting distance category, greater than 50 miles, with the largest increase from 6.3 percent of all commuters on urban roads in 2002 to 9.1 percent of commuters on urban roads by 2011.
- Commuters on rural roads showed similar results as urban over the same time period.

On average, Washington rural commuters have a longer commute than urban commuters

- Consistently, a smaller proportion of commuters from rural areas have had a short work commute, less than 10 miles, compared to commuters from urban areas.
- Consistently, a much larger proportion of commuters from rural areas have had a long commuting distance, greater than 50 miles, compared to commuters from urban areas.

Comparison of Fuel Consumption and VMT Allocation Model and the VOWS Survey

As noted in the Approach and Assumptions section, the Fuel Consumption and VMT Allocation Model and VOWS survey yielded different results for several of the same major driving activity indicators.

For example:

- For annual VMT, the model yielded an average of 8,891 miles per year per light-duty vehicle, while the VOWS survey yielded an average of 8,452 miles per year per light-duty vehicle.
- For fuel economy, the model yielded an effective statewide average of 19.5 mpg per vehicle in the inventory modeled, while the VOWS survey yielded an average of 24.8 mpg per vehicle.

The Commuting Patterns Study (“OntheMap”) did not investigate the same indicators on an annual basis.

The staff study group concluded that with an understanding of the approaches’ methods and biases, the differing results are not necessarily surprising.

The model is based on institutional data from the DOL, the WSDOT, and the U.S. EPA. While derived from sources that rely on long-standing protocols, the institutional data is not without error. For instance, the same protocols used to measure VMT on state facilities may not be followed on local facilities. In addition, individual vehicle fuel economy depends on how a vehicle is driven and maintained so utilizing EPA rating for fuel economy may overstate fuel economy.

The VOWS survey results are perceptions of travel activity that are self-reported via an online survey from a panel of self-selected statewide citizens who have shown interest in discussing transportation issues. These aspects of the survey may impact the representation of the results to the state as a whole. As such, efforts were taken to address the concern of potential representation impacts by “Weighting” the survey results. The raw survey results were weighted by age within a county and county within the state to represent Washington’s population. The survey approach taken relies on respondents’ perceptions of mileage driven and miles per gallon achieved instead of having respondents track data by a travel diary or tracking device. While this creates the possibility of perceptual errors, it does accurately reflect the perceived reality of mileage and MPGs of Washington respondents.

The staff study group believes that corrections for bias in each case could yield results from the two approaches that are more consistent with one another. Resources were not available to make those corrections for this study.

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Appendix A

Fuel Consumption and VMT Allocation Model

Detailed Findings and Methodology

The staff group evaluated a hypothetical road usage charge (RUC) by estimating the dollar impact to the taxpayer of switching to such a road usage charge from the current fuel tax. The approach focused on the revenue-side taxpayer impacts only; staff did not evaluate the administrative, expenditure-side impacts in this study.

To estimate the impacts, staff developed a vehicle-based model to simulate distributional differences in travel, fuel consumption, and tax or fee payments. Staff developed this model using several data sources: data from the Department of Licensing (DOL) Vehicle Headquarters System covering the entire Washington active light-duty vehicle fleet; 2011-13 data from the Washington Department of Transportation (WSDOT) Highway Performance Monitoring System; U.S. Environmental Protection Agency (EPA) fuel economy estimates for 1984-2014; and the 2009 National Household Travel Survey (NHTS).

The model was based on, for each vehicle, an estimate of annual vehicle miles of travel (VMT) and an estimate of fuel economy associated with the vehicle. The fuel economy estimate was obtained from the EPA data and the VMT estimate was obtained initially from the NHTS survey data and then adjusted to conform to WSDOT and DOL aggregate fuel consumption data. Staff modeled the per-vehicle fuel consumption by dividing the VMT by the fuel economy. Fuel tax estimates were calculated by multiplying the fuel consumption estimate by the fuel tax rate. To obtain a RUC estimate, staff applied a single RUC rate to the vehicle's VMT estimate. Staff determined the RUC rate by assuming that the gross revenue yielded under the RUC scenario would be the same as under statewide fuel tax; this is referred to as a "gross revenue neutral" RUC rate.

The model results allowed staff to compare impacts of switching to a hypothetical RUC to rural and urban drivers. In addition, the staff group also evaluated impacts to drivers of different vehicle types, of different vehicle ages, and of vehicles of different fuel economy.

Model Development

The first step in the development of the distributional model was to assess the nature of the 2014 Washington light-duty fleet. Based on the 5.1 million active household-based light duty vehicles in June 2014, described further in Appendix C, the staff group analyzed the data for distributions by various characteristics. Figure 1a shows these distributions for each characteristic. Comparison of this information with analogous information for the national fleet is discussed further below.

For comparison purposes, the distribution of the 2009 NHTS data is analyzed according to the same categories as were used for the DOL data; the results are shown in Figure 1b. Of note, the national light-duty household-based fleet in 2009 was much newer and more urban than the Washington light-duty household-based fleet in 2014: Figure 1b shows that about two-thirds of the household light-duty vehicles in 2009 were ten years old or less, while Figure 1a shows that 45 percent of Washington household light-duty vehicles in June 2014 were ten years of age or less. The national survey shows that 72 percent of all household light-duty vehicles are registered in urban areas, while for Washington the share is less than 60 percent.

Figure 1a. Characteristics of the 5.1 Million Light-Duty Vehicles in Washington Households in June, 2014.

By Geography:					
41% Rural			59% Urban		
By Vehicle Age Range:					
18% 1 to 5 yrs	27% 6 to 10 yrs	26% 11 to 15 yrs	16% 16 to 20 yrs	13% 21 + yrs	
By Number of Vehicles in Household:					
23% 1	30% 2	22% 3	13% 4	6% 5	6% 6+
By Vehicle Type:					
50% Car or Station Wagon		19% Pickup Truck	25% SUV	6% Van	

Source: Department of Licensing Vehicle Headquarters System and U.S. Census

Figure 1b. Characteristics of the 189.6 Million Light-Duty Vehicles of U.S. Households in mid-2009.

By Geography:					
28% Rural			72% Urban		
By Vehicle Age Range:					
34% 1 to 5 yrs	33% 6 to 10 yrs		19% 11 to 15 yrs	8% 16 to 20 yrs	6% 21 + yrs
By Number of Vehicles in Household:					
18% 1	41% 2		23% 3	11% 4	5% 5
92% 6+					
By Vehicle Type:					
52% Car or Station Wagon		19% Pickup Truck	21% SUV	9% Van	

Source: 2009 National Household Travel Survey

The second step in developing the distributional model was adding corresponding fuel economy estimates for each vehicle in the June 2014 light-duty fleet. Since DOL does not collect fuel economy data, it was necessary to obtain the data from an external source: the United States Environmental Protection Agency (EPA). The EPA determines fuel economy ratings according to specific protocols, and composite highway/city ratings are accessible online for regulated vehicles going back to 1984. Regulated vehicles include most light-duty cars and trucks under 8,500 GVW (and under 10,000 GVW since 2011).

For the purposes of this analysis, the staff group matched fuel economy ratings from the EPA data to the DOL data using information common to both data sets, such as engine configuration data. The procedure to supplement the DOL data involved both one-to-one matching and a statistical matching process called hot deck imputation. In brief, hot deck imputation involves, for a given record in a dataset, the identification of potential “matches” of one or more records in a second dataset, based on variables and values common to both, such as make, model, model year, engine displacement, and others. When more than one match was identified, staff then selected one of the matches at random and assigned the fuel economy value to the record in the first dataset.

In some other studies and analyses that have included the EPA fuel economy ratings, the values have been adjusted downward to account for real-world driving experiences that degrade actual fuel economy performance. The staff group investigated the effect of modifying the EPA fuel economy ratings downward but found that such an adjustment caused the model to over predict aggregate fuel consumption. So for the purposes of this study, staff did not modify the nominal EPA fuel economy ratings in the final version of the model.

The third step in the development of the model was to assign an initial estimate of annual VMT to each vehicle in the household-based light-duty vehicle fleet and then to calculate an estimate of annual fuel consumed. As with fuel economy, DOL does not collect annual VMT data. To develop the model, the staff group assigned estimates of annual VMT using data from the 2009 National Household Travel Survey (NHTS). The U.S. Department of Transportation (USDOT) conducts this survey periodically to better understand driving behavior and household characteristics. As part of the 2009 NHTS, USDOT collected information about travel behavior for over 150,000 households in the sample set. This included information on the more than 309,000 vehicles owned by the households in the sample. The annual VMT associated with each vehicle was not self-reported by the survey participants but rather developed using odometer and other survey data by a national science and energy research laboratory.

The 2009 NHTS results showed that there were statistically significant differences in VMT depending on several vehicle characteristics: registration location (i.e., urban or rural), vehicle type (e.g., passenger car, sport utility vehicle, etc.), vehicle age, number of vehicles in the household, vehicle fuel economy, and vehicle luxury status (i.e., whether the vehicle cost \$60,000 or more when bought new). The staff group assigned initial estimates of VMT using

the hot deck imputation statistical matching process, as described above, using the aforementioned variables. The staff group then modified the VMT values by multiplying each value by the ratio of the average VMT for light-duty vehicles in Washington to the average VMT nationally from the NHTS data. Staff obtained the in-state VMT data from WSDOT. As required by the Federal Highway Administration (FHWA), WSDOT collects traffic count data for all state-system roadways and then derives estimates of VMT driven on those roadways using roadway mileage data. WSDOT supplements this information with estimates of VMT driven on local roadways, provided by local governments. WSDOT is further able to estimate VMT for light-duty vehicles because the traffic counters distinguish vehicles with differing numbers of axles and tires. For this study, the staff group determined the average VMT by dividing the VMT for light-duty vehicles by the number of registered light-duty vehicles in the state (per DOL).

After the modification of the VMT vehicle record, the staff group further developed the model to calculate an annual estimate of fuel consumption. The staff group estimated the annual fuel consumption for each vehicle by dividing the annual VMT estimate by the EPA fuel economy rating. The staff group then compared the aggregate estimate of the modeled annual fuel consumption to known recent historical fuel consumption derived from fuel tax collections. To more closely attain the estimated fuel consumption amounts, the staff group then calibrated the model over several iterations, with adjustments made to the average VMT estimate and the VMT distribution across vehicle age. These adjustments are shown in Table 1.

Table 1: Estimation of Average Vehicle Miles of Travel for Light-Duty Household Vehicles

1	WSDOT HPMS Estimate of annual VMT for FHWA classes 1-3, 2011-13 average	51,255,782,000
2	Estimated annual VMT for FHWA class 1-3 vehicles other than cars and light trucks	2,366,910,300
3	Total Light-Duty VMT, cars and light trucks only, 2011-13 average ([Row 1] - [Row 2])	48,888,871,700
	Adjustment factors:	
4	Estimated growth from historical 2011-13 average to calendar year 2014	103.7%
5	Percent of total VMT driven on-road within taxable in-state jurisdictions	93.0%
6	Effective Annual VMT, light-duty vehicles ([Row 3] x [Row 4] x [Row 5])	47,148,241,700
7	Total number of household-based light-duty vehicles modeled (from DOL Vehicle Headquarter System, June 2014)	5,109,406
8	Business-based light-duty vehicles and household light-duty vehicles above 10,000 GVW	194,013
9	TOTAL Statewide light-duty fleet ([Row 7] + [Row 8])	5,303,419
10	Average Annual VMT per light-duty vehicle in WA ([Row 6] / [Row 9])	8,890

Source: WSDOT and DOL.

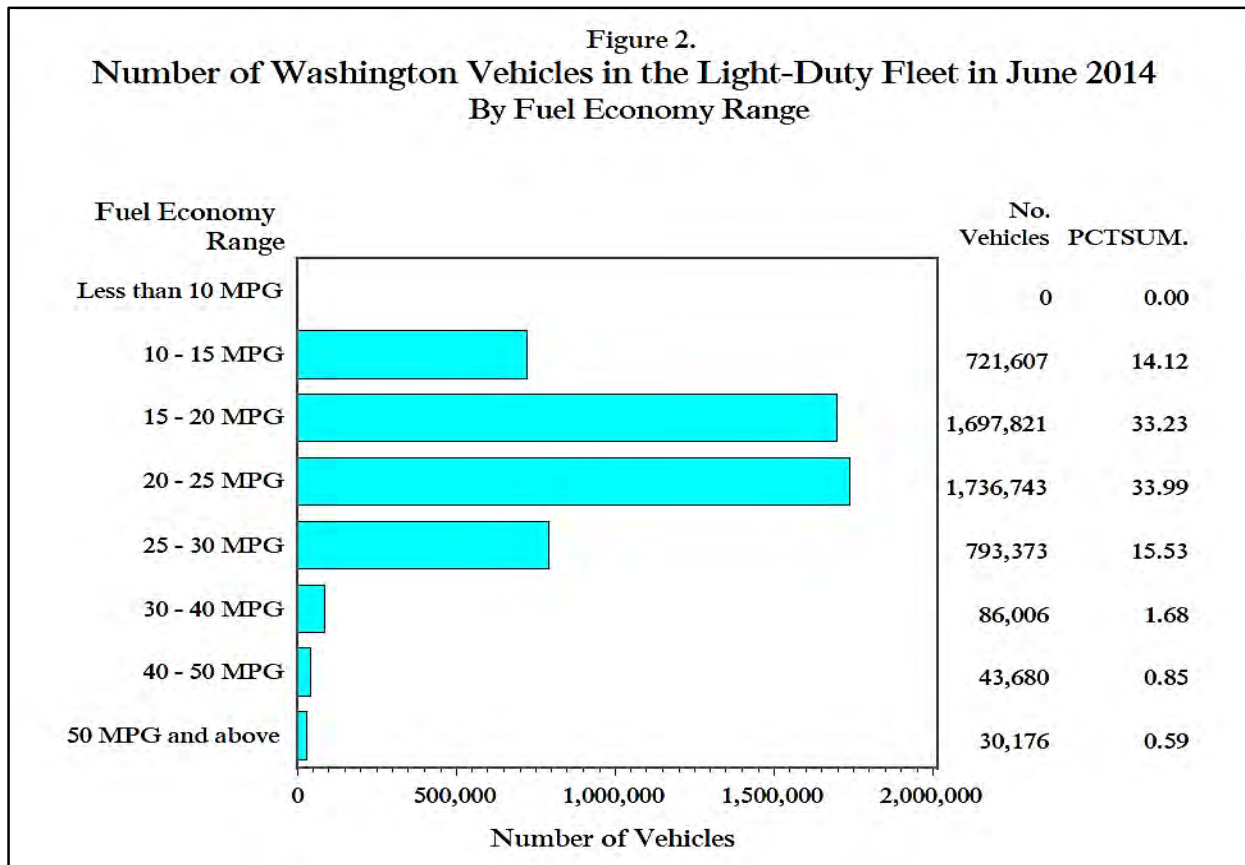
The fourth and final step in the model development was to add steps to estimate the gross revenue generated by the current fuel tax and gross revenue generated from a hypothetical

road usage charge, had the RUC been in place instead of fuel taxes for the time period modeled. An annual fuel tax estimate was determined for each vehicle by multiplying the estimated number of annual gallons of fuel consumed at the current state fuel tax rate of \$0.375 per gallon. A road usage charge estimate was determined by multiplying the estimate of annual VMT for the vehicle by a hypothetical road usage charge rate (\$0.0192).

The hypothetical road usage charge rate, for the purposes of this analysis, was derived assuming a gross revenue-neutral approach: under the hypothetical scenario, the amount of aggregate revenue was assumed to be equal to the amount generated under current law in fiscal year 2014. The charge rate was then calculated by taking the aggregate fuel tax estimated by the model and dividing by the aggregate VMT estimated by the model.

Findings

The fuel economy matching process results are shown below in Figure 2. In June 2014, a plurality of light-duty household-based vehicles (about 1.74 million, or 34 percent of the 5.1



Model data sources include June 2014 DOL Vehicle Headquarters System data and EPA fuel economy estimates for 1984-2014.

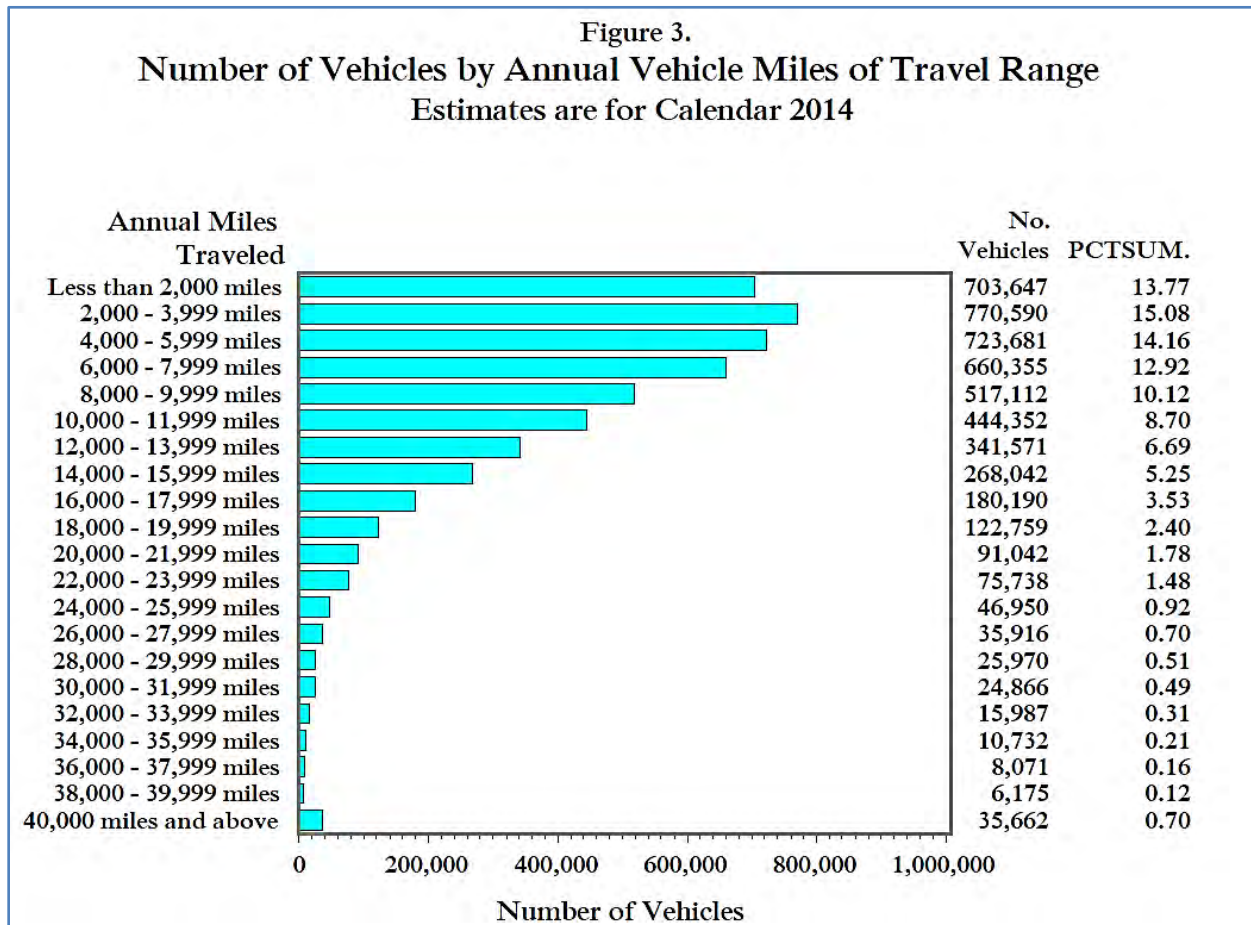
million vehicles) had an EPA rating of 20-25 miles per gallon (mpg). The nominal average fuel economy across the entire light-duty fleet of household vehicles was 20.4 mpg. However, the nominal average fuel economy for household light-duty vehicles was a bit higher than the effective average fuel economy (19.5 mpg). The effective average fuel economy for light-duty household vehicles is based on aggregate VMT and fuel consumption, as shown in Table 2. For context, as shown in Table 2, the estimated effective average fuel economy for all Washington vehicles – household, business, government, and other – and including light-, medium-, and heavy-duty - is 16.9 mpg. This estimate is based on dividing the statewide VMT by the statewide fuel consumption, from the Washington September 2014 forecast update documents.

Table 2. 2014 Modeled Light-Duty Vehicle Activity Compared to 2014 All-Vehicle Activity*

Measure	Household Light-Duty Fleet <i>Modeled estimates</i>	All Washington Vehicles <i>Forecast-based estimates</i>
Vehicle Miles of Travel	45.4 billion miles	57.1 billion miles
Gallons of Fuel Consumed	2.329 billion gallons	3.384 billion gallons
Estimated MPG	19.5 mpg	16.9 mpg

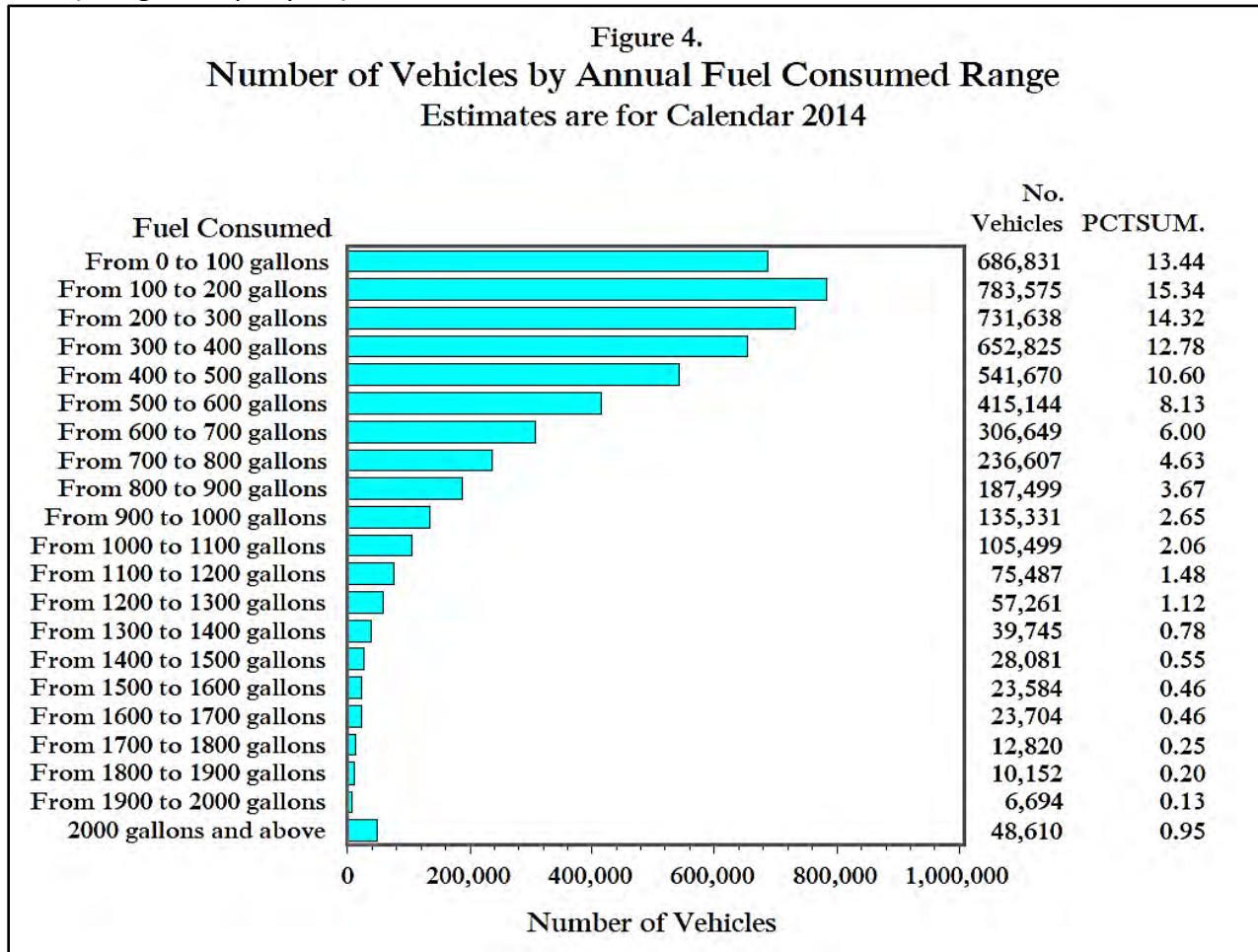
*Modeled figures shown represent estimates for calendar 2014 activity. Model data sources include June 2014 DOL Vehicle Headquarters System (VHS) data, EPA fuel economy estimates for 1984-2014, 2011-2013 estimates of VMT from the WSDOT Highway Performance Monitoring System, and the 2009 National Household Travel Survey (NHTS). Forecast-based estimates are averages of FY 2014 and FY 2015 figures in the September 2014 Transportation Revenue Forecast.

Figure 3 shows the distribution of the Washington light-duty household-based vehicle fleet by VMT ranges. The fleet’s mean VMT is 8,891 miles. However, as demonstrated in the chart, the fleet skews toward the lower-end of VMT ranges. Over half of all vehicles are driven less than 8,000 miles per year in Washington, with the median at 7,035 miles.



Model data sources include June 2014 DOL VHS data, EPA fuel economy estimates for 1984-2014, 2011-13 WSDOT HPMS, and the 2009 NHTS.

Figure 4 shows the fleet’s distribution by fuel consumption ranges. As the chart shows, the distribution is very similar to the fleet’s VMT distribution. This again results in a higher mean fuel consumption for the fleet (456 gallons per year) than median fuel consumption for the fleet (352 gallons per year).



Model data sources include June 2014 DOL VHS data, EPA fuel economy estimates for 1984-2014, 2011-13 WSDOT HPMS, and the 2009 NHTS.

Table 3 shows a comparison of estimated gross revenue from the fuel tax and a road usage charge. This estimate is based on the road usage charge rate of \$0.0192 derived from the vehicle-based model.

Table 3. Comparison of Gross Revenue from 2014 Modeled Light-Duty Vehicle Activity to Gross Revenue from 2014 All-Vehicle Activity*

Measure	Rate	Household Light-Duty Fleet <i>Modeled Estimates</i>	All Washington Vehicles <i>Forecast based Estimates</i>
Fuel Tax	\$0.375	\$873 Million	\$1.269 Billion
Road Usage Charge	\$0.0192	\$872 Million	N/A

*Modeled figures shown represent estimates for calendar 2014 activity. Model data sources include June 2014 DOL VHS data, EPA fuel economy estimates for 1984-2014, 2011-13 WSDOT HPMS, and the 2009 NHTS. Forecast-based estimates are averages of FY 2014 and FY 2015 figures in the September 2014 Transportation Revenue Forecast.

Using the modeled estimates for the household light-duty fleet shown above, the staff group developed an evaluation of the potential impact on users of a change from a fuel tax to a road usage charge. The results of this evaluation are shown in Table 4.

Table 4.
Comparison of a Fuel Tax with a Hypothetical Road Usage Charge – Calendar Year 2014

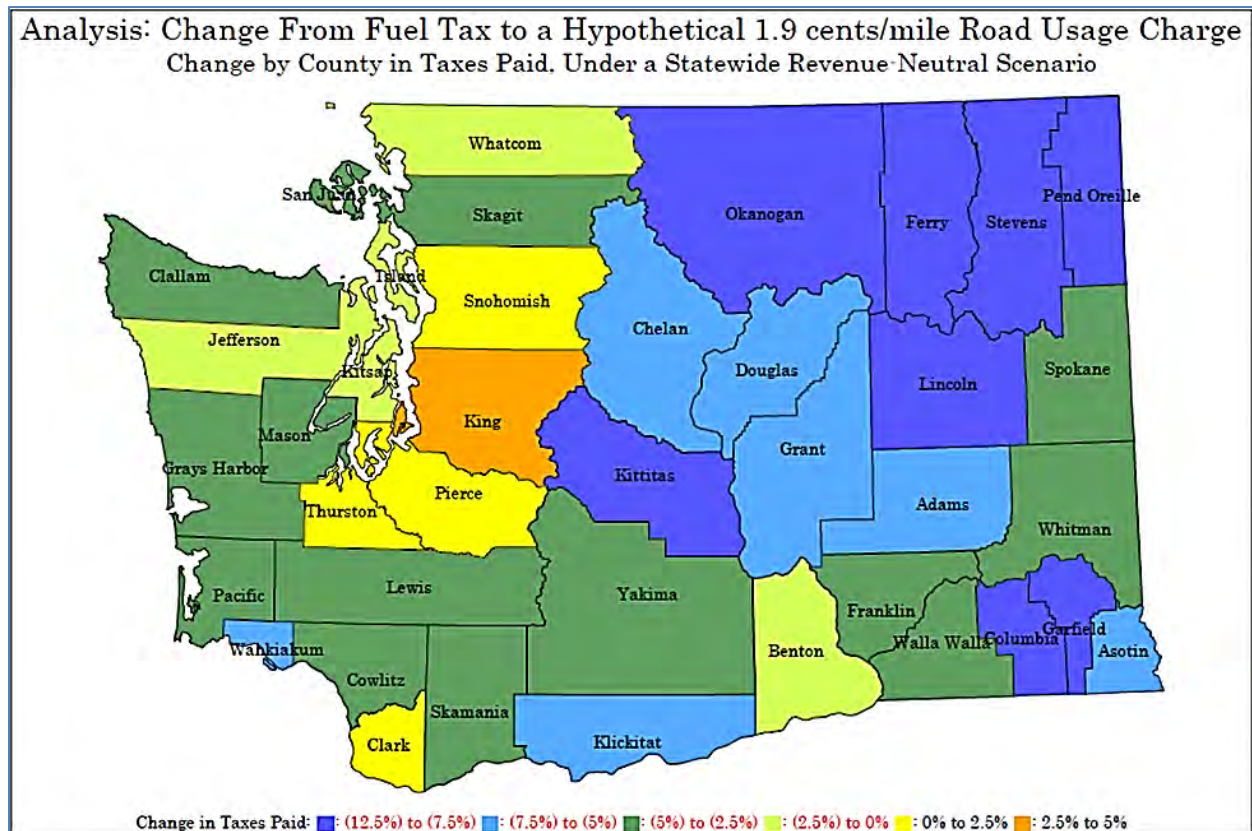
<i>Comparison Basis:</i>	Average Annual:				
	VMT (miles)	Fuel Consumed (gallons)	Fuel Tax Paid (\$, Current Law)	Road Usage Charges (\$, Hypothetical Scenario)	Impact of Change to Hypothetical Scenario (\$)
<i>By Geography</i>					
Rural	9,288	484	\$ 182	\$ 178	(\$ 4)
Urban	8,611	436	\$ 163	\$ 165	+ \$ 2
<i>By Vehicle Type</i>					
Car/Station Wagon	8,586	369	\$138	\$165	+ \$ 27
Pickup	7,791	510	\$191	\$150	(\$ 41)
Sport Utility Vehicle	10,268	580	\$218	\$197	(\$ 21)
Van/Minivan	9,025	498	\$187	\$173	(\$ 14)
<i>By Vehicle Age Range</i>					
1 year	13,121	549	\$206	\$252	+ \$ 46
2 years	12,873	558	\$209	\$247	+ \$ 38
3 – 5 years	12,582	576	\$216	\$242	+ \$ 26
6 – 10 years	11,422	596	\$223	\$219	(\$ 4)
11 – 15 years	8,253	451	\$169	\$158	(\$ 11)
16 – 20 years	5,426	294	\$110	\$104	(\$ 6)
21+ years	3,546	212	\$80	\$68	(\$ 12)
<i>By Fuel Economy Range</i>					
10 – 15 mpg	7,055	533	\$200	\$135	(\$ 65)
15 – 20 mpg	8,881	523	\$196	\$171	(\$ 25)
20 – 25 mpg	8,916	412	\$155	\$171	+ \$ 16
25 – 30 mpg	9,916	373	\$140	\$190	+ \$ 50
30 – 40 mpg	11,015	348	\$131	\$211	+ \$ 80
40 – 50 mpg	10,746	246	\$92	\$206	+ \$ 114
50+ mpg	12,654	205	\$77	\$243	+ \$ 166
Overall Averages	8,891	456	\$171	\$171	\$ 0

Model data sources include June 2014 DOL VHS data, EPA fuel economy estimates for 1984-2014, 2011-13 WSDOT HPMS, and the 2009 NHTS.

With respect to impacts on rural and urban drivers, the model showed that the change to a hypothetical road usage charge results in very little change to the annual amounts of taxes paid: \$4 less for rural drivers and \$2 more for urban drivers. For both rural and urban drivers, this is a change of less than 2 percent in annual taxes paid. The change slightly benefits rural drivers because currently, though they drive more each year, they also consume more fuel on a per-mile basis than do urban users.

While the statewide effect of a direct transition from fuel tax to a RUC is marginal across urban and rural drivers as a whole, the effect is more pronounced for drivers in certain areas. At the county level, the impact of the modeled transition in terms of amount of annual taxes paid ranges from -11 percent in Ferry County to almost 5 percent in King County; see figure 5. That is, under a scenario in which the current fuel tax of 37.5 cents is replaced by a 1.9 cent/s mile RUC, Ferry County drivers would see their tax bill drop by 11 percent on average, whereas drivers in King County would see their tax bill rise by 5 percent on average. The reason for this is because such a change (from fuel tax to RUC) would benefit current drivers of light-duty vehicles that are less fuel efficient than average, and would be a cost to drivers of light-duty vehicles that are more fuel efficient than average. The model shows that, Ferry County drivers' vehicles are the least fuel efficient, compared to the state average, while King County drivers' vehicles are the most fuel efficient. Therefore, Ferry County drivers' tax payments would drop the most and King County drivers would increase the most.

Figure 5. County Comparison of Change in Taxes Paid under Fuel Tax and Hypothetical RUC



The impacts in categories of analysis other than geography are starker. For example, drivers of cars and station wagons would pay about \$27 more per year on average, while drivers of other vehicle types would obtain a benefit, with the average tax for pickup truck drivers dropping by \$41. In addition, newer vehicles and more fuel efficient vehicles would tend to pay more, with the taxes paid by the most fuel efficient vehicles more than tripling. On the other hand, drivers of older and less fuel-efficient vehicles would see a benefit.

Figure 6 illustrates the effects of a potential change from the current fuel tax to the hypothetical road usage charge for selected vehicle models. The effect depends on how a vehicle’s fuel economy compares to the effective statewide average of 19.5 mpg. Drivers of vehicles for which the fuel economy is significantly better than the effective average would pay more, such as with the Prius (\$121 more) and the Tesla (\$253 more). Those with vehicles for which the fuel economy is less than the effective average, such as with the 2013 Nissan Titan, would benefit (\$99 less, in the case of the Titan).

Figure 6. Potential Impacts from a Change from the Current Fuel Tax to a Hypothetical Road Usage Charge for Calendar Year 2014: An Illustration Using Selected Makes and Models.

Make/Model:	2013 Nissan Titan	1996 Ford Explorer 2WD	1999 Plymouth Voyager	2005 VW Jetta 5-cylinder	2008 Toyota Prius	2013 Tesla Model "S"
Number of Vehicles in WA in June 2014	73	360	1,319	1,386	5,674	834
Estimated Annual VMT (miles)	13,068	5,724	8,327	10,909	10,992	13,157
Fuel Economy (miles/gal)	14	16	18	22	46	∞
Estimated Fuel Consumed (gal)	933	358	463	496	239	-
Estimated Fuel Tax Paid (\$)	\$350	\$134	\$173	\$186	\$90	\$0
Hypothetical Road Usage Charge (\$)	\$251	\$110	\$160	\$209	\$211	\$253
Impact of Change to Hypothetical RUC	(\$99)	(\$24)	(\$14)	\$24	\$121	\$253
Current-Law: Annual Fuel Bill + Tax (\$)	\$3,455	\$1,326	\$1,714	\$1,837	\$885	\$0
Current Law: (Ann'l Fuel Bill+Tax) / VMT	26.4 ¢/mi	23.2 ¢/mi	20.6 ¢/mi	16.8 ¢/mi	8.1 ¢/mi	0.0 ¢/mi
Hypothetical: Annual Fuel Bill + RUC (\$)	\$3,357	\$1,301	\$1,700	\$1,861	\$1,007	\$253
Hypothetical: (Ann'l Fuel Bill+RUC) /VMT	25.7 ¢/mi	22.7 ¢/mi	20.4 ¢/mi	17.1 ¢/mi	9.2 ¢/mi	1.9 ¢/mi

There are other observations about the illustration in Figure 6 that may be worth noting. First, the estimated annual mileage of the late-model vehicles shown here is similar, at 11,000 to 13,000 miles. For this reason, the amount that would be paid under the hypothetical road usage charge scenario is similar, in the \$210-250 range. On the other hand, under the current fuel tax law, there is a sizeable discrepancy in annual tax payments for fuel consumed by these

vehicles. The Titan drivers are estimated to pay about \$350 on average, whereas the Prius drivers are estimated to pay about \$90 on average. Of course, Tesla Model S drivers pay \$0, though purely electrically powered vehicles such as the Tesla Model S must pay an additional registration fee of \$100 each year.

Second, even under a hypothetical road usage charge, the annual cost per mile of operating the vehicle based on fuel and tax payments is still substantially less for the more fuel efficient vehicles than for the less fuel efficient vehicles. For example, based on the nationally forecasted price of about \$3.70 per gallon for the western states for 2014, the Prius owner would pay about 9.2 cents per mile in fuel and road usage charge costs, while the Titan owner would pay about 25.7 cents per mile.

Appendix B

Voice of Washington State (VOWS) Survey

Detailed Findings

Background:

The Voice of Washington State (VOWS) survey panel was established in 2011 and as of October 2014 has grown to over 30,000 active panel members statewide. It is comprised of people from all over the state who want to share their views and preferences on transportation issues. Individuals interested in joining the survey panel can sign up anytime on the VOWS website (<http://voiceofwashingtonsurvey.org/>). All VOWS surveys are emailed to panel members and are completed by them online. Surveys are conducted periodically throughout the year and vary in length and topic. All results from the surveys are sent to the Governor and Legislature for their consideration and review.

The entire VOWS Survey on Vehicle Type and Miles Drive in Washington report can be found at: (http://www.wstc.wa.gov/StatewideTransportationSystem/documents/2014_RUCFleetJunesurvey_Report_000.pdf)

Road Usage Charge VOWS Survey Methodology:

The following was the methodology used for the survey:

- The RUC questions were appended to the end of WSTC's Washington State Ferries General Public Survey, since the study of RUC urban and rural impacts was not funded.
- The WSF/RUC survey was sent via email to the Voice of Washington State (VOWS) panel on June 12th, with seven follow-up reminders sent before the survey's close on June 28th.
- 5,708 surveys were submitted by panel members; 5,638 were usable.

Weighting of The VOWS Data to Reflect Washington Population by Age /

County:

A total of 5,638 completed surveys from all parts of the state were weighted by age within a county and the

Counties were weighted to their state proportion as follows:

- The weighing was based on the Census 2000 Summary File 1 Data Population by Age, Sex, and Race/Ethnicity for Washington State and Counties prepared by Washington State Office of Financial Management (<http://www.ofm.wa.gov/census2000/sf1/tables/ctable19.htm>).
- The actual numbers of men and women over 18 were added together for each age groupings by county and for the state as a whole.

- (County population over 18 / Statewide population over 18) was used to determine each “Counties weight.”
- (County age group / County population over 18) was used to determine each “County Age Groups weight.”
- (County weight * County Age Group weight) was used to determine the “County to State Age Groups weight.”
- An adjustment to the “County to State Age Groups weight” was made to compensate for age groupings that we did not have any actual surveys in.
- The “Adjusted County to State Age Group weight” was applied to each respondent in that county age group.

The outcome is a weighted data set proportional to age groups at both the state and county levels.

Key VOWS Survey findings:

When comparing rural, urban, and suburban respondents we found the following:

- Rural households reported having the highest **average number of people in their household**(3.2) compared to Suburban (2.7) or Urban (2.6)
- Rural households tend to report earning lower **incomes** than suburban and urban households
- Rural households reported having the highest **average of licensed drivers**(2.4) compared to Suburban (2.1) or Urban (2.0)
- Rural households reported having the highest **average of vehicles per household**(2.7) compared to Suburban (2.3) or Urban (1.7)
- Rural households reported driving the highest **total miles per year**(22,243) compared to Suburban (18,368) or Urban (13,206)
- Rural households reported driving the highest **average of miles per vehicle**(8,862) compare to Suburban (8,402) or Urban(8,054)
- Rural households reported driving the highest **average of miles per driver**(9,268) compared to Suburban(8,747) or Urban (6,603)
- Rural households reported only a slightly lower **MPG average** (24.4) compared to Suburban (24.7) and Urban (24.8)

VOWS Survey Respondent Weighted Profile:

The following tables outline how representative the VOWS respondents that completed the June RUC survey are to that of the State of Washington. Certain VOWS demographics are compared to the 2013 American Community Survey (ACS) one-year estimates for Washington State. The American Community Survey is a nationwide mandatory survey that collects and produces information on demographic, social, economic, and housing characteristics about our nation's population every year. This survey is administered by the US Census Bureau and is used by Federal, State, Local, Non-governmental entities for planning and informational

purposes. The American Community Survey was selected as proxy for reasonable representation of residents in the State of Washington.

Below is a comparison of VOWS survey and the ACS on four profile characteristics including Gender, Age, Education, and Household Income.

Note: All profile comparisons are based on Adults 18 years and over in Washington State.

<u>Gender</u>	Washington VOWS RUC Respondents	WA - ACS
Male	61%	50%
Female	39%	50%

<u>Age Range</u>	Washington VOWS RUC Respondents	WA – ACS
18-24	9%	13%
25-34	19%	18%
35-44	23%	17%
45-54	21%	17%
55-64	12%	17%
65 and over	16%	18%

<u>Education</u>	Washington VOWS RUC Respondents	WA - ACS
Some High School or less	<1%	11%
High School Graduated	6%	24%
Vocational / Technical School	4%	N/A%
Some College / Associates Degree	30%	35%
Four-Year College Degree	36%	20%
Post Graduate Degree	23%	10%
Other	01%	00%

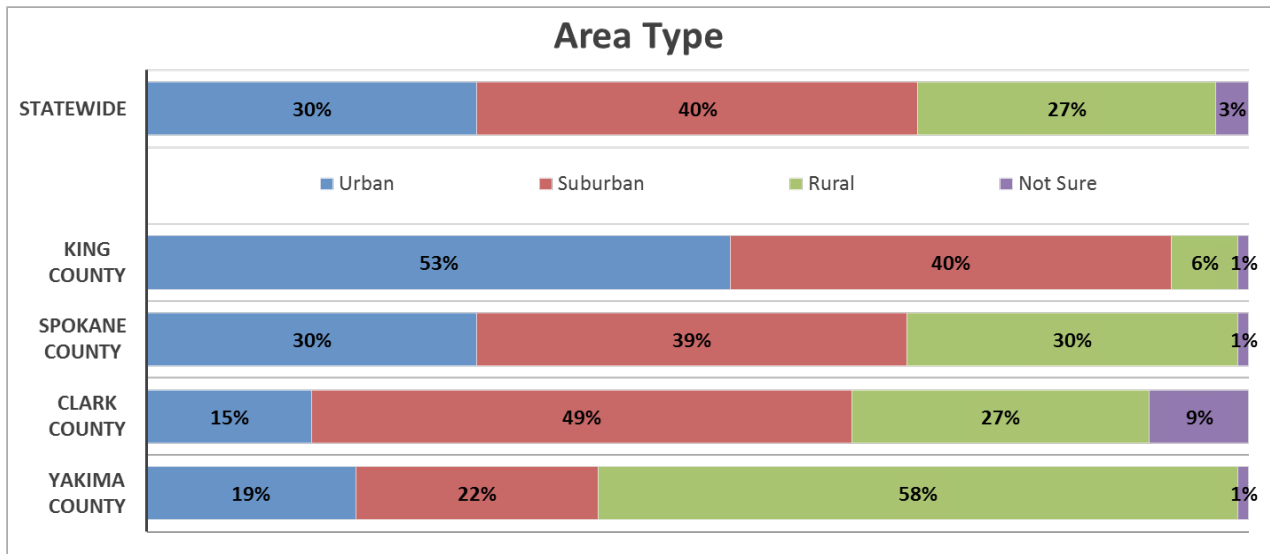
<u>Household Income Range</u>	Washington VOWS RUC Respondents	WA - ACS
Less than \$14,999	04%	11%
\$15,000 to \$24,999	06%	09%
\$25,000 to \$34,999	07%	09%
\$35,000 to \$49,999	12%	13%
\$50,000 to \$74,999	23%	19%
\$75,000 to \$99,999	20%	13%
\$100,000 to \$149,999	20%	15%
\$150,000 or more	09%	11%

Voice of Washington State (VOWS) Survey Statewide results:

SELF CLASSIFICATION (Urban, Suburban, and Rural):

A similar number of respondents classified their household as being located in an urban (30%) or rural (27%) area, though the largest number of respondents chose the suburban category (40%):

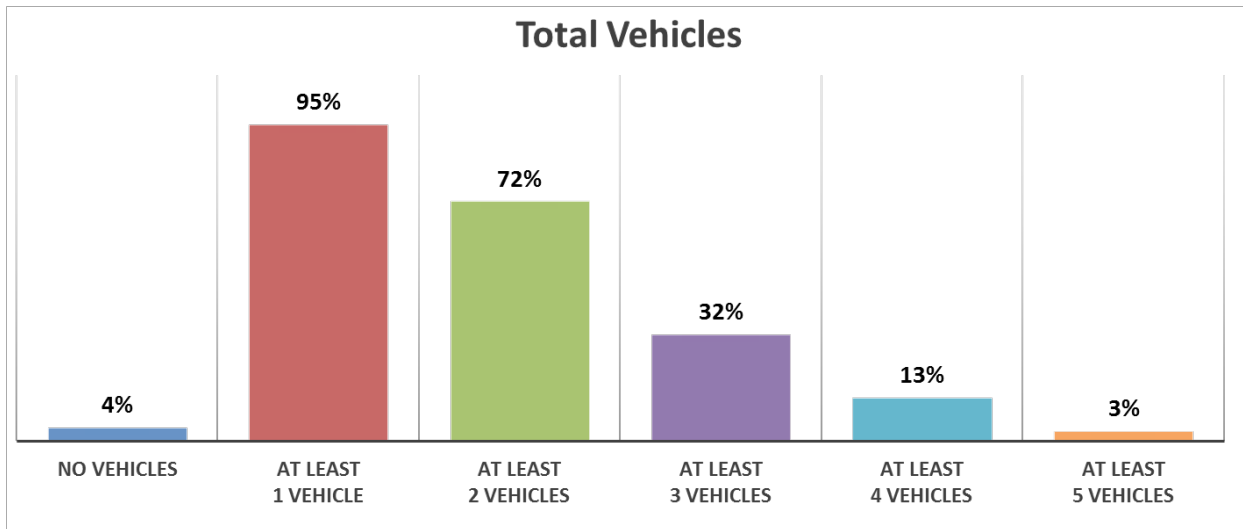
- 30% urban
- 40% suburban
- 27% rural
- 3% unsure



TOTAL VEHICLES (excluding motorcycles, motorhomes):

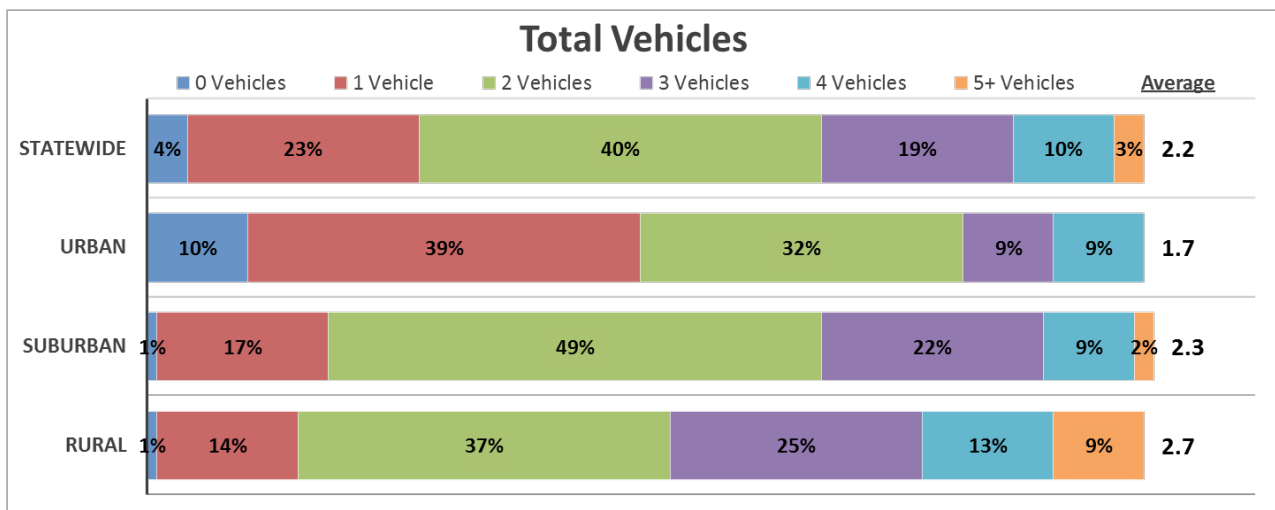
Survey respondents reported having households with at least the following number of vehicles:

- 95% with at least one vehicle
- 72% with at least two vehicles
- 32% with at least three vehicles
- 13% with at least four vehicles
- 3% with at least five vehicles
- 4% with zero vehicles



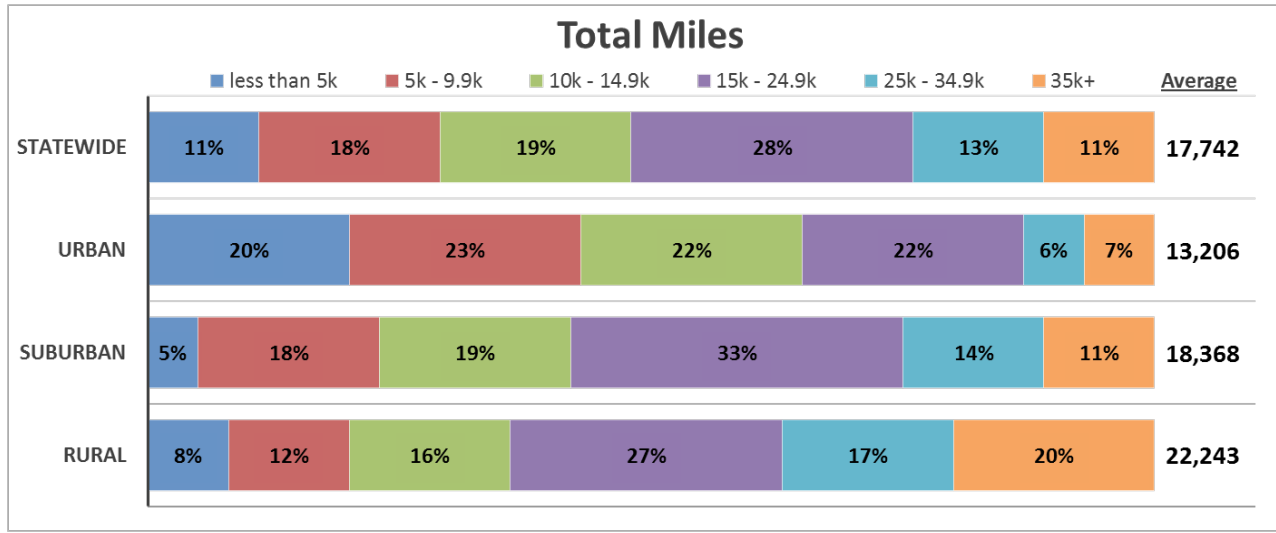
TOTAL VEHICLES by Urban, Rural, Suburban (excluding motorcycles, motorhomes):

- Statewide survey respondents, the average number of vehicles per household reported is **2.2**
- Rural areas have the highest average with 2.7 vehicles per household, followed by Suburban areas at 2.3 vehicles, and Urban areas at 1.7 vehicles



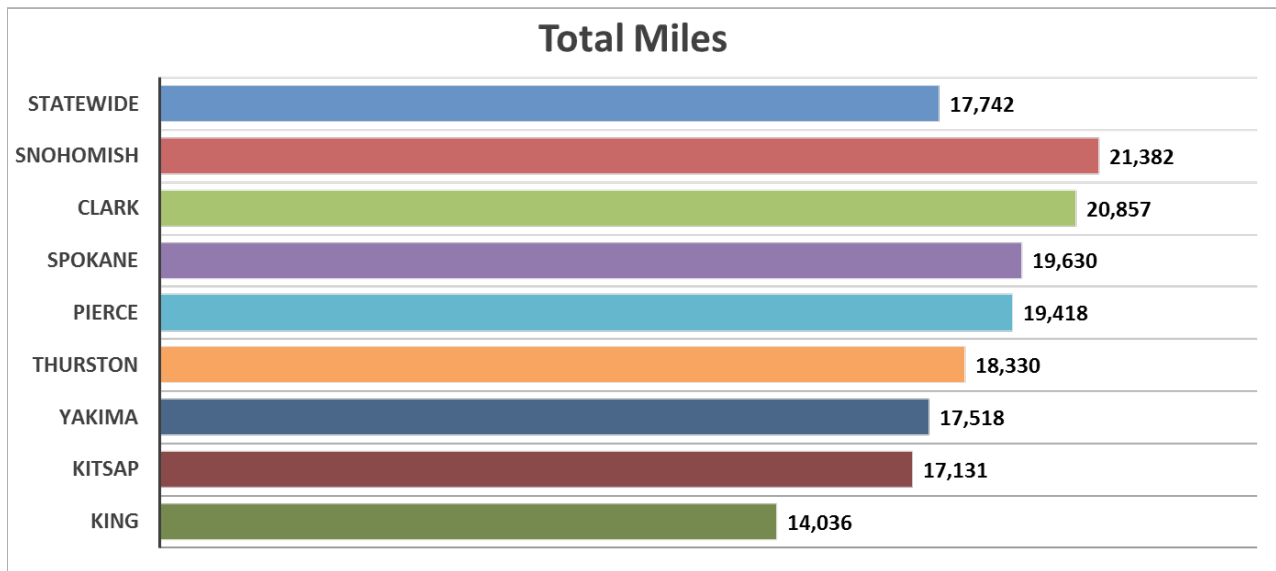
TOTAL MILES DRIVEN:

- The average household drives 17,742 miles per year
- Residents in Rural areas drive the most: 22,243 miles per year for the average household
- Residents in Urban areas drive the least: 13,206 miles for the average household



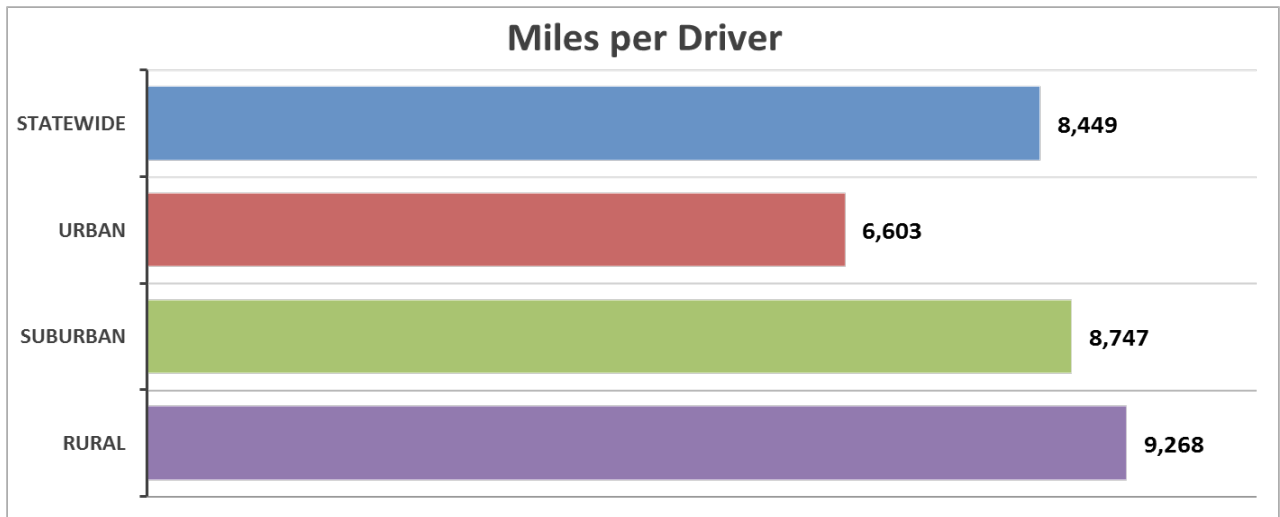
TOTAL MILES DRIVEN: Select Counties

- King County households report driving less per year than the state average and less than households in other major counties
- Snohomish and Clark County households report driving the most



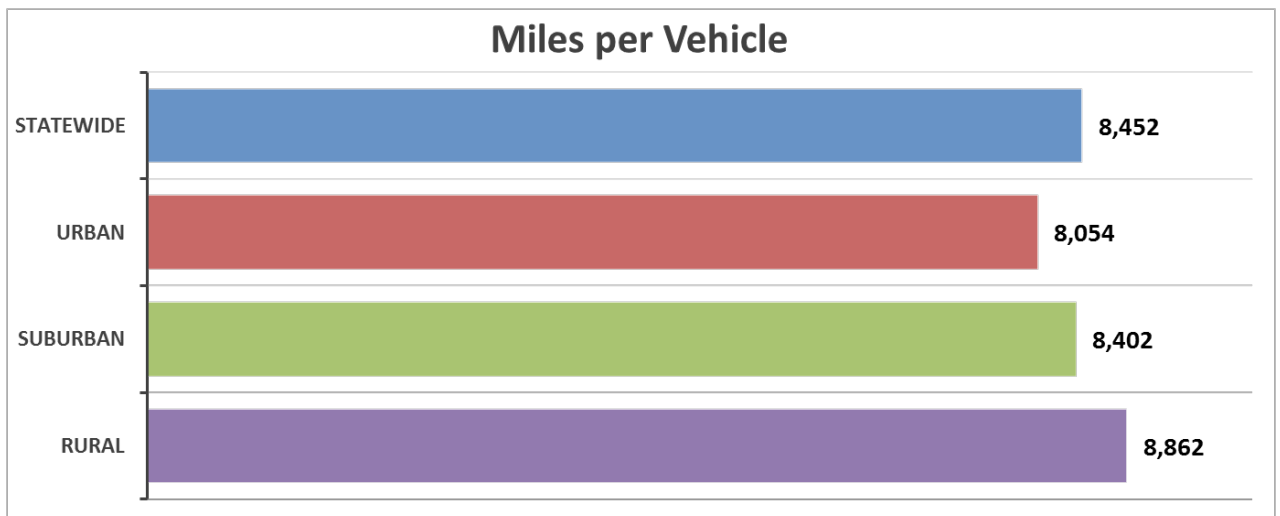
AVERAGE MILES DRIVEN PER DRIVER:

- Based on a statewide average of 2.1 licensed drivers per household, each driver averages 8,449 miles per year (17,742 miles / 2.1 drivers)
- Rural households average 9,268 miles per driver, compared to 8,747 miles per driver in Suburban areas, and 6,603 miles per driver in Urban areas



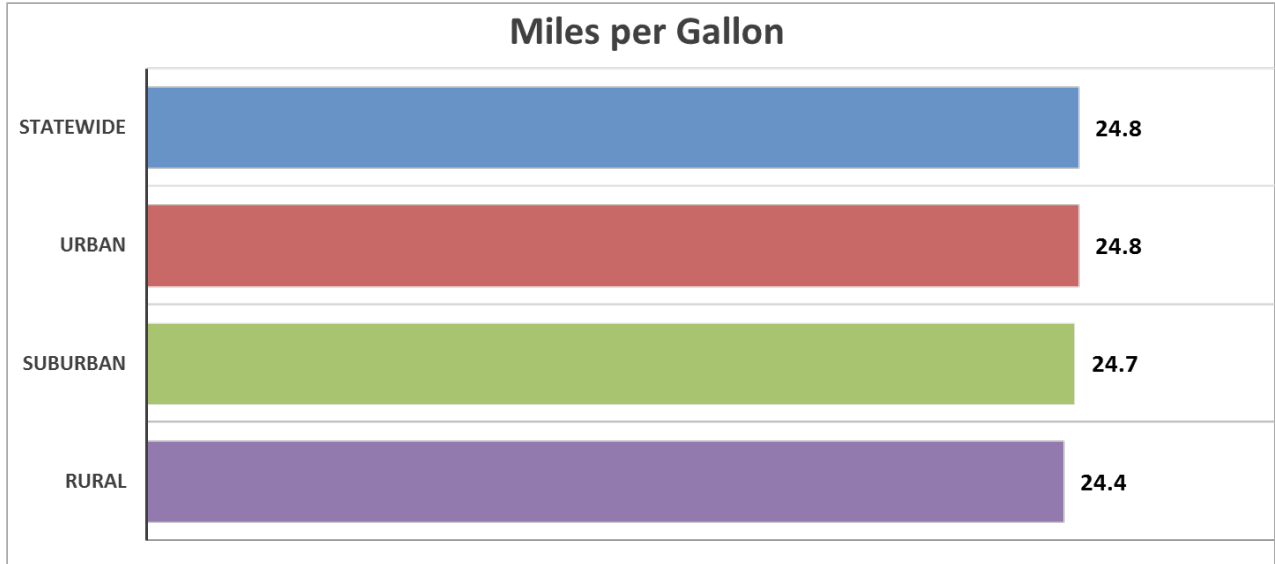
AVERAGE MILES DRIVEN PER VEHICLE:

- The average vehicle is driven an average of 8,452 miles per year
- Residents in Rural areas drive an average of 8,862 miles per vehicle
- Residents in Suburban areas drive an average of 8,402 miles per year
- Residents in Urban areas drive an average of 8,054 miles per year



MILES PER GALLON:

- Survey respondents reported a statewide combined average miles per gallon for all vehicles a household owns is 24.8 MPG
- Survey respondents reported little difference in their combined average MPG



Appendix C

DOL Source Data: Defining Washington's Light-Duty Household Vehicle Fleet

In support of this study, the Department of Licensing (DOL) was asked to generate an account of approximately how many currently registered light-duty vehicles resided in each household (VPH) in Washington State. In response to this request, DOL took the following steps:

- Used data from DOL's Vehicle Headquarters System (VHS) database
- Defined light-duty as passenger vehicles and light trucks with gross weight of 10,000 lbs. or less
- Selected unexpired motor vehicles with Washington addresses
- Excluded business-owned vehicles
- Standardized address formats to promote better matching
- Identified each group of vehicles with matching addresses as a 'household'

The resulting dataset contained about 5 million currently registered light-duty motor vehicles owned by people in Washington households.

Appendix D

Commuter Patterns of Washington State Residents and US Census OnTheMap Data Results

Given the legislative charge to study the urban and rural financial and equity implications of a potential road usage charge in the state, actual commuting patterns in the state were examined through US Census OnTheMap data. Given that commuting to work is the primary reason for road usage, examining commuting patterns can explain a lot of differences between rural and urban drivers and how they would be impacted by a new road user charge.

This national GIS based database titled OnTheMap has matched the addresses of both employment and employees' home address locations. This database is provided to the U.S. Census Bureau by the Bureau of Labor Statistics (BLS) through their Quarterly Census of Employment and Wages (QCEW). QCEW covers 98 percent of U.S. jobs. These jobs are those covered by unemployment insurance and do not include non-covered employment typically performed by sole proprietors or members of partnerships. Users of OnTheMap can query the database in a web based GIS system for commuting distances in various locations throughout the US. WSDOT-Economic Analysis has queried the state of Washington commuting patterns, by county and WSDOT delineated rural versus urban areas. Our results include just primary jobs even though OnTheMap provides other filter choices such as all jobs (including secondary jobs). Primary jobs were selected for this analysis in order to avoid double counting certain individuals' commutes to secondary jobs which may not be on a regular basis.

The OnTheMap national database has commuting patterns for years 2002-2011. Examining the commuting patterns over time reveals a trend that more individuals are commuting longer distances over the past ten years. OnTheMap calculates one-way distances between employees' home address and employment locations and categorizes them into four distance categories: less than 10 miles, 10 to 25 miles, 25 to 50 miles, and greater than 50 miles.

Figures 1 and 2 reveal the commuting trends since 2002 for all commuters in the state. The results indicate that in 2002, there were 2.378 million people commuting to primary jobs in Washington state and by 2011 total commuters had increased 10.7% to 2.631 million. The commuting patterns indicate that in 2002, 56.9% of the commuters in the state had less than 10 miles to commute to work and by 2011 that percentage had declined to 51.5%. In addition, all other longer commuting distance categories saw an increase in their share of commuters between 2002 and 2011. The longest commuting distance category increased the most. Initially, 7.9% of all commuters had to drive more than 50 miles to work in 2002 and that increased to 11.8% by 2011. The same results for all commuters are also revealed in the rural and urban commuter pattern results.

In 2002, there were 1.8 million urban commuters (75.7% of total) and 0.57 million rural commuters (24.3% of total). Ten years later, urban commuters rose to 1.98 million (75.3% of total) and rural commuters rose as well to 0.65 million (24.7% of total). Figure 3 shows the trends in the urban commuters' shares. The urban commuters with the shortest commute distance, less than 10 miles, saw a decline in their percentage from 58.6% in 2002 to 54.4% in 2011. All other longer commuting distance categories saw their shares rise with the longest commuting distance category, greater than 50 miles, with the largest increase from 6.3% of all urban commuters in 2002 to 9.1% of urban commuters by 2011. Rural commuters showed similar results as urban with some notable differences. Figure 4 demonstrates the change in shares of rural commuters by commuting distances between 2002 and 2011. These results reveal that rural commuters have consistently had a smaller percentage of all rural commuters with a short work commute, less than 10 miles, and a much larger percentage of all rural commuters with a longer commuting distance of greater than 50 miles than urban commuters.

Figure 1: Number of All commuters by length of work commute – 2002 - 2011

All commuters by length of work commute 2002-2011

Number of Commuters

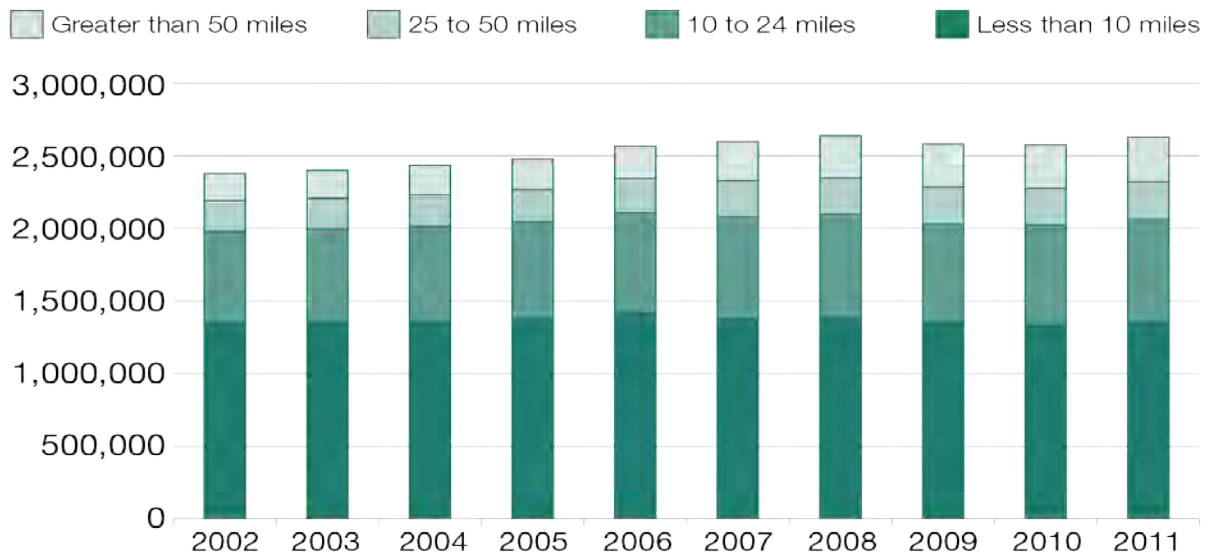


Figure 2: Share of All commuters by length of work commute – 2002 – 2011

Share of all commuters (%) by length of work commute; 2002-2011

Percentage of All Commuters

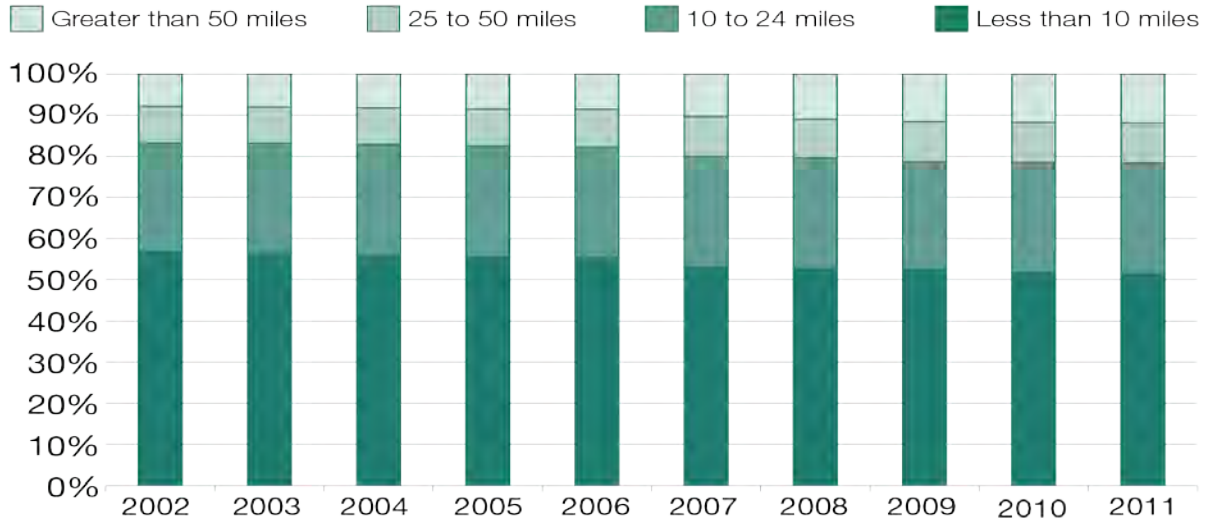


Figure 3: Share of Urban commuters by length of work commute – 2002 – 2011

Share of urban commuters (%) by length of work commute; 2002-2011

Percentage of Urban Commuters

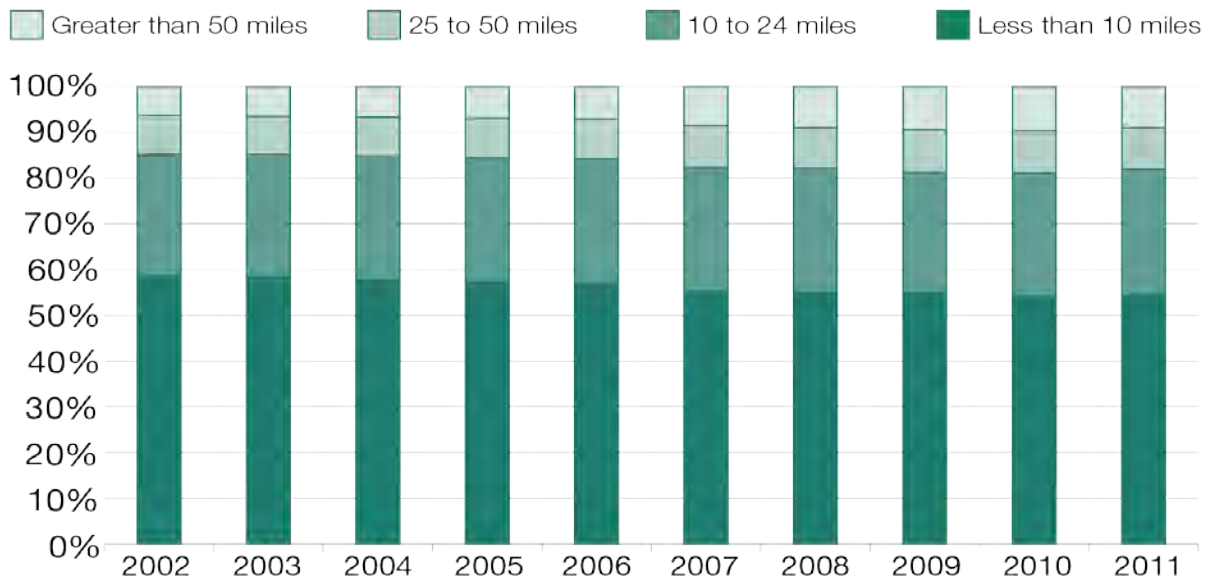


Figure 4: Share of Rural commuters by length of work commute – 2002 – 2011

Share of rural commuters (%) by length of work commute; 2002-2011

Percentage of Rural Commuters

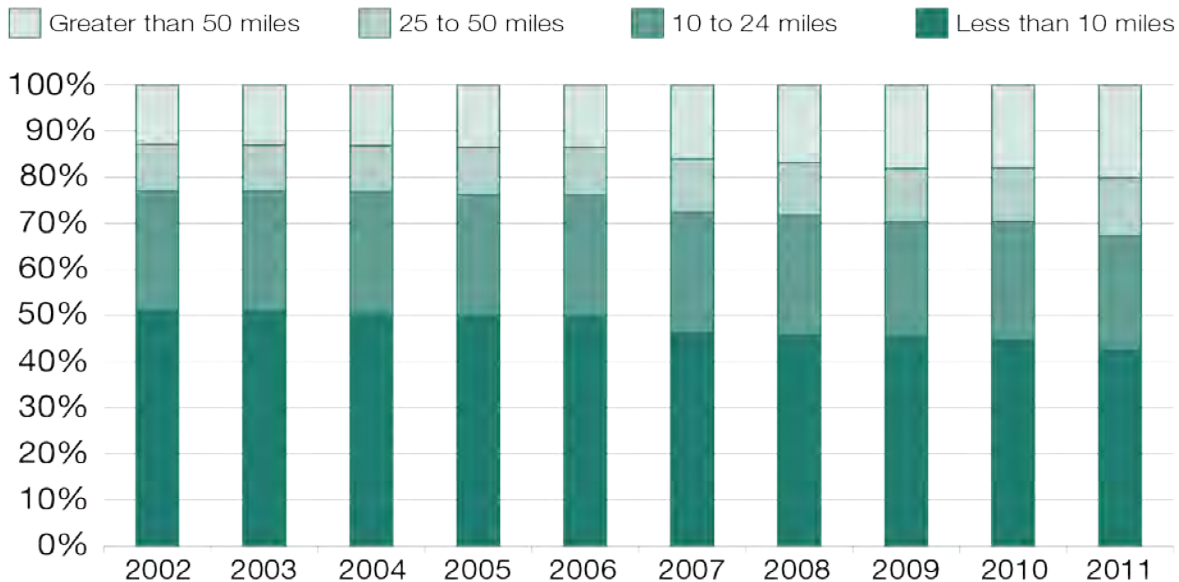


Figure 4 reveals that rural commuters have had a decline in percentage of commuters with a short work commute since 2002. In 2002, 51.2% of all rural commuters drove less than 10 miles to work and that share decreased to 42.6% in 2011, which is consistent with urban commuter results. Overall, rural commuters have a smaller share of all commuters at 42.6% of all rural commuters in 2011 than urban commuters at 54.4% of all urban commuters. In addition, rural commuters driving between 10-25 miles one way to work declined 1.2% to 24.6% of rural commuters where urban commuters' share of commuters in this category grew to 27.6% over the last ten years. Rural commuters also have a much higher portion of all rural commuters driving more than 50 miles, one way, to work. That trend has been growing. In 2002, 12.9% of all rural commuters drove more than 50 miles, one way, to their primary work. By 2011, more than 20% of all rural commuters had driven more than 50 miles to work. That rural share of 20% is more than double the share of urban commuters at 9.1% driving more than 50 miles to work in 2011.

Figures 5-8 compare the urban and rural areas share of all commuters by distance for the Top 25 rural and urban areas. Figure 5 ranks the urban and rural areas with the largest share of commuters driving less than 10 miles. This chart reveals that of the Top 25 areas with the largest share of the commuters driving less than 10 miles, only 5 areas were from rural areas, all the rest were urban areas. This again reinforces the result that residents' from urban areas in the state have shorter work commutes than workers' from rural areas except for rural areas in counties like Spokane and Yakima. For commutes between 10-25 miles, the Top 25 areas were rural areas having the largest percentage of their commuters falling in this distance category

with a few notable exceptions. Spokane's urban area had the largest percentage of its commuters, 54%, driving between 10-25 miles and six other urban areas also had large percentages of their commuters driving 10-25 miles. For commuting distances between 25-50 miles, the top 25 areas were rural areas except for four urban areas in these counties, Island, Mason, Jefferson and Pierce. The rural area with the largest share was Mason county with 30.9% of its rural commuters driving between 25-50 miles, one way. The areas with the largest share of its commuters driving more than 50 miles were rural counties, with Ferry county rural area having the largest share at 53.4%. The top 17 of the 25 rural and urban areas with the largest share of commuters, driving the longest distance, were in rural counties. The urban county with the largest share of total commuters driving more than 50 miles was Lewis urban area residents with 32.7% of its commuters. The other six urban areas also had shares which hovered around 31 - 32% of commuters driving more than 50 miles.

In conclusion, these OnTheMap results reveal that commuting patterns have been changing over the past 10 years for both rural and urban commuters. Even though urban commuters have seen their share of short commutes decline, their share of urban commuters with a work commute of less than 10 miles is still higher, 54.4%, than rural commuters at 42.6% of all rural commuters driving less than 10 miles, one way, to their primary job in 2011. Rural commuters also have a smaller share of commuters with work commutes between 10 and 25 miles, 24.6%, than urban commuters at 27.6%.

The opposite is true in the longer commute categories. The rural residents have 12.7% of all commuters driving between 25 and 50 miles versus the urban commuters at 8.9% of all urban commuters driving longer distances in 2011. The same is true in the longest commute category of greater than 50 miles. More than 20% of rural commuters drive more than 50 miles, one way, to work versus 9% of urban commuters which drive more than 50 miles, to work. The longer work commutes of rural residents could result in higher road user charges compared to urban commuters given the differences in the commute distances to drive to their primary work locations given all other factors being the same among commuters.

All Commuters: Counties' Rural and Urban Area Commutes Top 25 Ranked by Percentage of Commuters and Distance

Figure 5. Commuting Distance Less Than 10 Miles: Top 25 Urban and Rural Counties

Less than 10 miles	Area	Percentage of total Commuters
1	Franklin Urban	75.8
2	Asotin Urban	70.8
3	Spokane Rural	67.6
4	Walla Walla Urban	65.2
5	Whitman Urban	63.3
6	Benton Urban	61.8
7	King Urban	61.0
8	Whatcom Urban	60.8
9	Jefferson Urban	60.1
10	Douglas Urban	59.9
11	Yakima Rural	59.7
12	Chelan Urban	58.0
13	Kittitas Urban	56.1
14	Clark Urban	55.8
15	Thurston Urban	55.2
16	Yakima Urban	53.7
17	Adams Urban	53.3
18	Grant Urban	51.5
19	Kitsap Urban	49.7
20	Cowlitz Urban	49.5
21	Pierce Urban	45.8
22	Clallam Urban	45.6
23	Whatcom Rural	44.1
24	Asotin Rural	43.6
25	Columbia Rural	42.7

Figure 6. Commuting Distance Between 10-25 Miles : Top 25 Urban and Rural Counties

10-25 miles	Area	Percentage of total Commuters
1	Spokane Urban	53.8
2	Clark Rural	47.0
3	King Rural	45.4
4	Asotin Rural	41.6
5	Kitsap Rural	40.9
6	Franklin Rural	40.3
7	Pierce Rural	39.8
8	Benton Rural	39.6
9	Snohomish Rural	39.3
10	Snohomish Urban	38.9
11	Kitsap Urban	35.8
12	Walla Walla Rural	31.9
13	Pierce Urban	30.4
14	Thurston Rural	30.4
15	King Urban	29.9
16	Whatcom Rural	29.8
17	Mason Rural	29.6
18	Whitman Rural	28.0
19	Cowlitz Rural	27.7
20	Clark Urban	27.4
21	Island Rural	27.0
22	Stevens Rural	26.5
23	Skamania Rural	24.2
24	Wahkiakum Rural	23.7
25	Grays Harbor Rural	23.0

All Commuters: Counties' Rural and Urban Area Commutes Top 25 Ranked by Percentage of Commuters and Distance...Continued

Figure 7. Commuting Distance 25-50 Miles: Top 25 Urban and Rural Counties

25-50 miles	Area	Percentage of total Commuters
1	Mason Rural	30.9
2	Pend Oreille Rural	30.7
3	Jefferson Rural	29.4
4	Pierce Rural	27.7
5	Island Rural	27.6
6	Skamania Rural	27.4
7	Island Urban	26.8
8	Snohomish Rural	26.5
9	Lincoln Rural	26.2
10	Douglas Rural	25.6
11	Garfield Rural	24.6
12	Mason Urban	23.6
13	Franklin Rural	22.9
14	Lewis Rural	22.7
15	Jefferson Urban	22.2
16	Walla Walla Rural	21.7
17	Ferry Rural	21.2
18	Thurston Rural	19.4
19	Cowlitz Rural	19.3
20	Grant Rural	19.2
21	Grays Harbor Rural	18.2
22	Kittitas Rural	18.1
23	Pierce Urban	17.5
24	Adams Rural	17.4
25	Stevens Rural	17.0

Figure 8. Commuting Distance Greater Than 50 Miles: Top 25 Urban and Rural Counties

Greater than 50 miles	Area	Percentage of total Commuters
1	Ferry Rural	53.4
2	Lincoln Rural	46.2
3	Okanogan Rural	42.0
4	Grays Harbor Rural	41.5
5	Clallam Rural	41.3
6	Douglas Rural	40.2
7	Pacific Rural	39.7
8	Wahkiakum Rural	39.7
9	Pend Oreille Rural	37.7
10	Klickitat Rural	37.4
11	Garfield Rural	37.1
12	Lewis Rural	36.5
13	San Juan Rural	36.2
14	Chelan Rural	35.6
15	Kittitas Rural	35.5
16	Grant Rural	33.7
17	Adams Rural	33.1
18	Lewis Urban	32.7
19	Grays Harbor Urban	32.5
20	Chelan Urban	31.6
21	Whitman Urban	31.5
22	Clallam Urban	31.4
23	Cowlitz Urban	31.2
24	Stevens Rural	30.9
25	Skagit Urban	30.7

Caveats to the OnTheMap Database

1. OnTheMap measures commutes as the one-way distance between locations from residence to work. Miles travelled is calculated as Euclidean distance (straight line or “as the crow flies”).
2. Employers in Washington occasionally list all employees at the location of their head office rather than the actual physical location of the employment office. The Employment Security Department makes every effort (especially for large employers) to correct for this location misrepresentation in their submittals of Washington employment data to QCEW. These adjustments are reflected in the OnTheMap database on the Census Bureau’s web site.
3. Since OnTheMap only provides distances between home and work locations in four distance categories: less than 10 miles, 10 to 25 miles, 25 to 50 miles, and greater than 50 miles, there is no direct measure of central tendency such as the mean or median for the distance categories. Origin-Destination Employment Statistics (LODES) used by OnTheMap are available for download. Unfortunately, the downloaded data does not include the Euclidean distance between the employees’ home address and their work locations either. As a result, an average commute distance for each of the 4 distance categories is not readily available but a simple average of the distance category could be calculated but it would not be a true mean for that distance category.

Additional OnTheMap Charts

Figure 9. Urban Commuters in 2002
Commuting Distance breakdown

Urban Commuters: How far were commutes in 2002?
Total commuters = 1.808 million

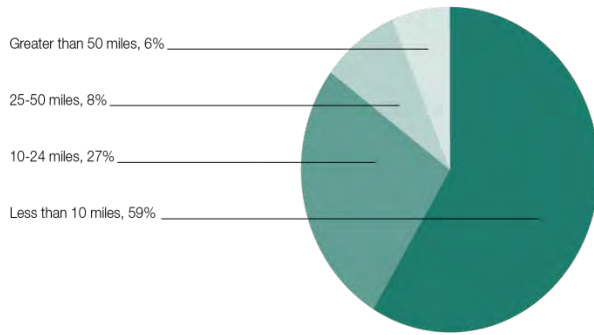


Figure 10. Urban Commuters in 2011
Commuting Distance breakdown

Urban Commuters: How far were commutes in 2011?
Total commuters = 1.98 million

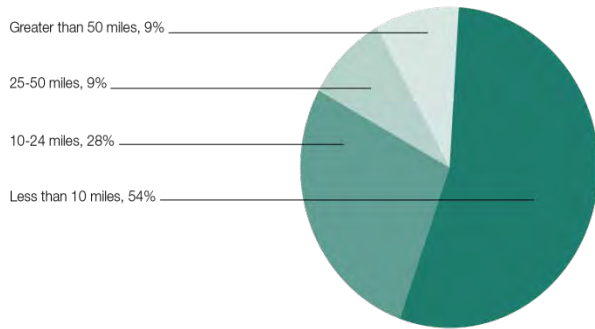


Figure 11. Rural Commuters in 2002
Commuting Distance breakdown

Rural Commuters: How far were commutes in 2002?
Total commuters = 0.57 million

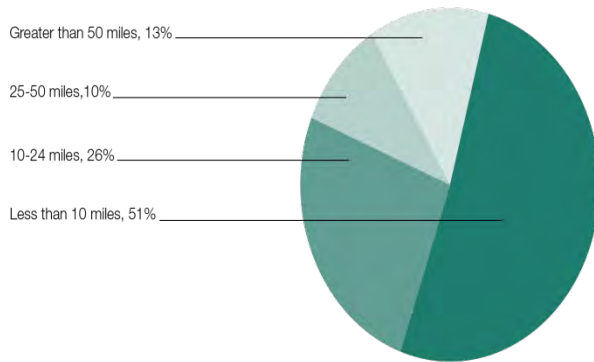
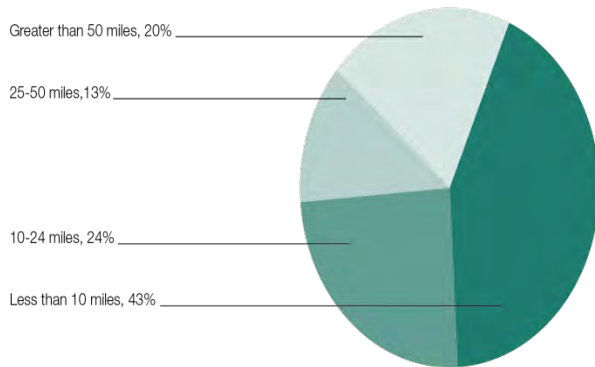


Figure 12. Rural Commuters in 2011
Commuting Distance breakdown

Rural Commuters: How far were commutes in 2011?
Total commuters = 0.65 million



Urban Commuters: Counties' Urban Area Commutes Ranked by Percentage of Urban Commuters by Distance

Note: There were 12 counties which did not have an urban area, thus, only 27 out of 39 counties had a classification of urban area.

Figure 13. Commuting Distance Less Than 10 Miles: Urban Counties' Rankings

Less than 10 miles	Area	Percentage of urban commuters
1	Franklin	75.8
2	Asotin	70.8
3	Walla Walla	65.2
4	Whitman	63.3
5	Benton	61.8
6	King	61.0
7	Whatcom	60.8
8	Jefferson	60.1
9	Douglas	59.9
10	Chelan	58.0
11	Kittitas	56.1
12	Clark	55.8
13	Thurston	55.2
14	Yakima	53.7
15	Adams	53.3
16	Grant	51.5
17	Kitsap	49.7
18	Cowlitz	49.5
19	Pierce	45.8
20	Clallam	45.6
21	Snohomish	41.1
22	Spokane	39.5
23	Grays Harbor	38.7
24	Skagit	38.2
25	Island	36.3
26	Mason	36.1
27	Lewis	35.9

Figure 14. Commuting Distance Between 10-25 Miles: Urban Counties' Rankings

10-25 miles	Area	Percentage of urban commuters
1	Spokane	53.8
2	Snohomish	38.9
3	Kitsap	35.8
4	Pierce	30.4
5	King	29.9
6	Clark	27.4
7	Skagit	22.5
8	Yakima	21.9
9	Island	20.4
10	Mason	18.4
11	Whatcom	18.1
12	Thurston	16.6
13	Grays Harbor	16.1
14	Grant	15.7
15	Adams	14.6
16	Lewis	14.6
17	Clallam	12.5
18	Benton	11.7
19	Franklin	8.6
20	Asotin	7.2
21	Douglas	7.0
22	Chelan	4.7
23	Cowlitz	4.7
24	Whitman	4.3
25	Jefferson	3.8
26	Walla Walla	3.3
27	Kittitas	3.2

Urban Commuters: Counties' Urban Area Commutes Ranked by Percentage of Urban Commuters by Distance-Continued...

Note: There were 12 counties which did not have an urban area, thus, only 27 out of 39 counties had a classification of urban area.

Figure 15. Commuting Distance Between 25-50 Miles: Urban Counties' Rankings

25 to 50 miles	Area	Percentage of urban commuters
1	Island	26.8
2	Mason	23.6
3	Jefferson	22.2
4	Pierce	17.5
5	Lewis	16.8
6	Thurston	15.6
7	Cowlitz	14.6
8	Yakima	14.6
9	Snohomish	13.5
10	Walla Walla	13.4
11	Grays Harbor	12.8
12	Adams	11.9
13	Kittitas	11.7
14	Kitsap	10.5
15	Clallam	10.5
16	Franklin	9.8
17	Skagit	8.6
18	Grant	6.4
19	Benton	6.1
20	Chelan	5.6
21	King	4.8
22	Spokane	4.8
23	Douglas	4.6
24	Whatcom	3.3
25	Clark	2.6
26	Asotin	2.5
27	Whitman	1.0

Figure 16. Commuting Distance Greater than 50 Miles: Urban Counties Rankings

Greater than 50 miles	Area	Percentage of urban commuters
1	Lewis	32.7
2	Grays Harbor	32.5
3	Chelan	31.6
4	Whitman	31.5
5	Clallam	31.4
6	Cowlitz	31.2
7	Skagit	30.7
8	Kittitas	29.0
9	Douglas	28.5
10	Grant	26.4
11	Mason	21.9
12	Benton	20.5
13	Adams	20.2
14	Asotin	19.4
15	Walla Walla	18.0
16	Whatcom	17.8
17	Island	16.5
18	Clark	14.2
19	Jefferson	13.9
20	Thurston	12.6
21	Yakima	9.9
22	Snohomish	6.5
23	Pierce	6.2
24	Franklin	5.8
25	King	4.3
26	Kitsap	4.0
27	Spokane	2.0

Rural Commuters: Counties' Rural Area Commutes Ranked by Percentage of Rural Commuters by Distance

Figure 17. Commuting Distance Less Than 10 Miles: Ranked 1-39

Less than 10 miles	Area	Percentage of rural commuters
1	Spokane	67.6
2	Yakima	59.7
3	Whatcom	44.1
4	Asotin	43.6
5	Columbia	42.7
6	San Juan	42.2
7	Skagit	41.0
8	Chelan	36.4
9	Kittitas	35.4
10	Clallam	35.3
11	Adams	34.4
12	Benton	33.1
13	Thurston	32.9
14	Island	32.8
15	Jefferson	32.4
16	Kitsap	32.0
17	Cowlitz	30.7
18	Whitman	29.8
19	Klickita	29.5
20	Franklin	28.7
21	King	28.4
22	Walla Walla	28.3
23	Pacific	28.0
24	Okanogan	27.0
25	Garfield	26.0
26	Stevens	25.7
27	Clark	25.3
28	Grant	24.6
29	Snohomish	24.4
30	Mason	21.6
31	Skamania	21.0
32	Wahkiakum	20.4
33	Lewis	18.6
34	Pend Oreille	18.2
35	Grays Harbor	17.3
36	Ferry	16.0
37	Douglas	14.0
38	Pierce	13.7
39	Lincoln	9.6

Figure 18. Commuting Distance Between 10-25 Miles: Ranked 1-39

10-25 miles	Area	Percentage of rural commuters
1	Clark	47.0
2	King	45.4
3	Asotin	41.6
4	Kitsap	40.9
5	Franklin	40.3
6	Pierce	39.8
7	Benton	39.6
8	Snohomish	39.3
9	Walla Walla	31.9
10	Thurston	30.4
11	Whatco	29.8
12	Mason	29.6
13	Whitman	28.0
14	Cowlitz	27.7
15	Island	27.0
16	Stevens	26.5
17	Skamania	24.2
18	Wahkiakum	23.7
19	Grays Harbor	23.0
20	Grant	22.5
21	Lewis	22.1
22	Chelan	20.5
23	Douglas	20.2
24	Klickita	20.1
25	Spokane	19.3
26	Pacific	19.3
27	Skagit	19.1
28	Columbia	18.9
29	Jefferson	18.3
30	Lincoln	18.0
31	Okanogan	15.6
32	Adams	15.1
33	Yakima	13.8
34	Clallam	13.7
35	Pend Oreille	13.4
36	Garfield	12.3
37	Kittitas	11.0
38	Ferry	9.5
39	San Juan	8.4

Rural Commuters: Counties' Rural Area Commutes Ranked by Percentage of Rural Commuters by Distance-Continued...

Figure 19. Commuting Distance Between 25-50 Miles: Ranked 1-39

25 to 50 miles	Area	Percentage of rural commuters
1	Mason	30.9
2	Pend Oreille	30.7
3	Jefferson	29.4
4	Pierce	27.7
5	Island	27.6
6	Skamania	27.4
7	Snohomish	26.5
8	Lincoln	26.2
9	Douglas	25.6
10	Garfield	24.6
11	Franklin	22.9
12	Lewis	22.7
13	Walla Walla	21.7
14	Ferry	21.2
15	Thurston	19.4
16	Cowlitz	19.3
17	Grant	19.2
18	Grays Harbor	18.2
19	Kittitas	18.1
20	Adams	17.4
21	Stevens	17.0
22	Skagit	16.9
23	King	16.3
24	Wahkiakum	16.2
25	Okanogan	15.3
26	Kitsap	15.1
27	Benton	14.9
28	Columbia	13.8
29	Whitman	13.2
30	San Juan	13.2
31	Klickitat	13.0
32	Pacific	12.9
33	Clark	10.3
34	Asotin	10.0
35	Clallam	9.7
36	Chelan	7.5
37	Yakima	5.5
38	Whatcom	5.0
39	Spokane	2.0

Figure 20. Commuting Distance Greater than 50 Miles: Ranked 1-39

Greater than 50 miles	Area	Percentage of rural commuters
1	Ferry	53.4
2	Lincoln	46.2
3	Okanogan	42.0
4	Grays Harbor	41.5
5	Clallam	41.3
6	Douglas	40.2
7	Pacific	39.7
8	Wahkiakum	39.7
9	Pend Oreille	37.7
10	Klickita	37.4
11	Garfield	37.1
12	Lewis	36.5
13	San Juan	36.2
14	Chelan	35.6
15	Kittitas	35.5
16	Grant	33.7
17	Adams	33.1
18	Stevens	30.9
19	Whitman	29.0
20	Skamania	27.4
21	Columbia	24.6
22	Skagit	23.0
23	Cowlitz	22.3
24	Whatcom	21.2
25	Yakima	20.9
26	Jefferson	19.9
27	Pierce	18.8
28	Walla Walla	18.1
29	Mason	17.8
30	Clark	17.4
31	Thurston	17.4
32	Island	12.7
33	Benton	12.4
34	Kitsap	12.0
35	Spokane	11.1
36	King	9.8
37	Snohomish	9.8
38	Franklin	8.1
39	Asotin	4.7

Appendix E

Rural and Urban Areas in Washington State

Given the legislature's interest in understanding equity and financial impacts of a potential road usage charge on the state's urban and rural areas, a delineation of rural and urban areas throughout the state was required for this study. Part of the study used the Census Bureau definitions of rural and urban, other analysis relied on WSDOT definitions of rural and urban approved by FHWA and another part of the study used rural, urban and suburban as reported by survey respondents for rural, suburban and urban areas.

Rural and Urban Areas – Census Bureau

The staff workgroup developed the fuel consumption and vehicle miles of travel (VMT) allocation model using a distribution pattern based on the 2009 National Household Travel Survey (NHTS), including whether the household (and the vehicle registered to the household) is in a rural or urban area. The NHTS variable selected for the purpose of statistical matching the Washington Department of Licensing data (see Appendix A) was the "URBRUR" variable, which indicates whether the address is in an urban or rural area, based on the 2000 Census definition. For Census 2000, the Census Bureau classifies as "urban" all territory, population, and housing units located within an urbanized area (UA) or an urban cluster (UC). It delineates UA and UC boundaries to encompass densely settled territory, which consists of:

- core census block groups or blocks that have a population density of at least 1,000 people per square mile and
- surrounding census blocks that have an overall density of at least 500 people per square mile

In addition, under certain conditions, less densely settled territory may be part of each UA or UC. The Census Bureau's classification of "rural" consists of all territory, population, and housing units located outside of UAs and UCs.

The rationale for using the Census Bureau's classification for the model was that the model was developed to ascribe VMT, fuel consumption, and taxes paid to the location at which the vehicle was registered (and, by inference, where the driver lives), rather than the location where the driving activity occurred. On the other hand, the analysis of commuting patterns analyzed vehicle activity based on the location of the activity. This is described below.

considered rural areas. FHWA only has urban and rural distinctions in Washington state. Most counties have both a rural and urban area, but 11 counties in 2013 did not have an urban area.

This definition of urban and rural is used as the basis for the reference layer for geographic information systems (GIS) at the Washington State Department of Transportation. This same definition of urban and rural has been applied to other datasets (like OnTheMap and Department of Licensing vehicle registrations) used in the road user charge equity study.

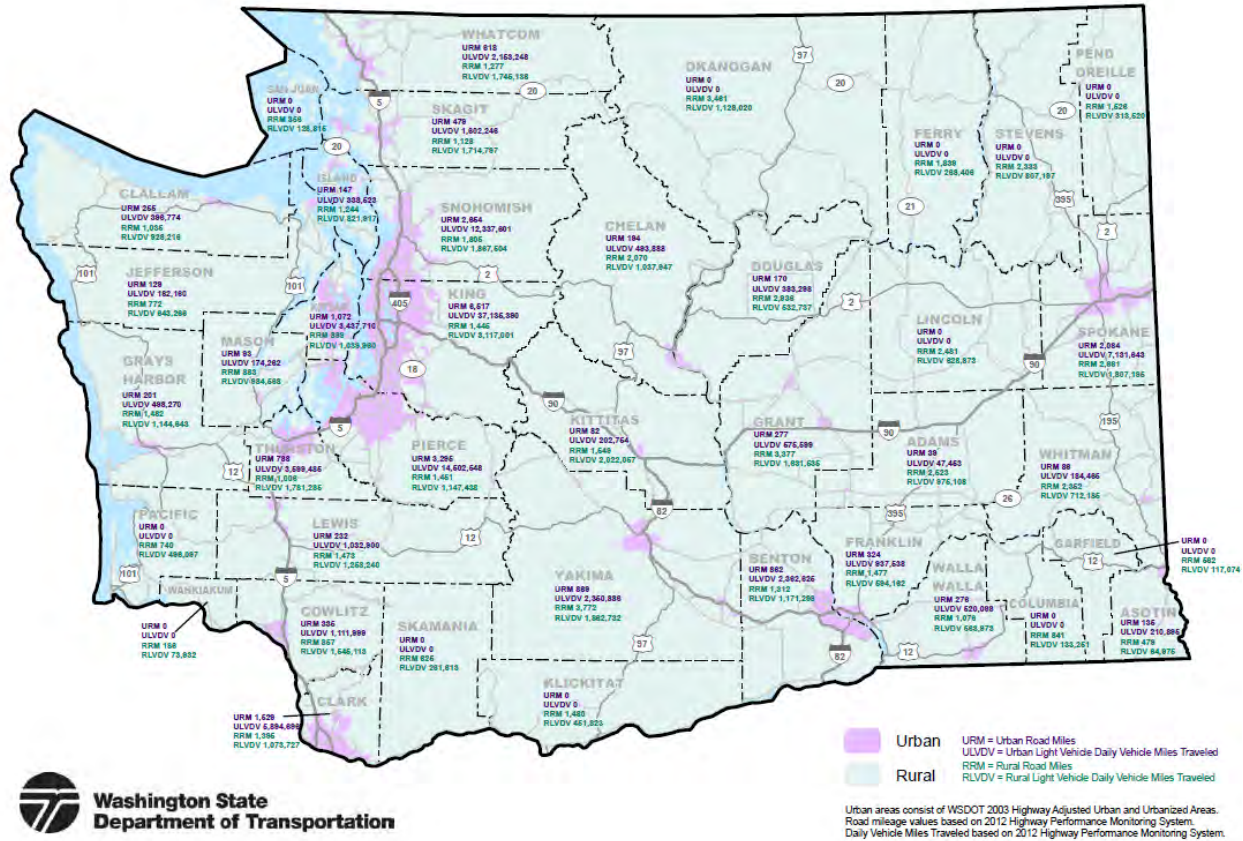
Regional Results

Given the urban and rural delineations, WSDOT calculated the road lane miles throughout the state of Washington based on the rural and urban areas of each county. In addition, WSDOT also calculated the average daily traffic volume for each county's urban and rural areas. Figures 2 and 3 reveal the maps of the state's urban and rural areas with 2012 lane miles and average daily vehicle miles traveled data. Figure 2 has the average daily vehicle miles traveled (DVMT) for all vehicles in 2012. Figure 3 reports the average daily vehicle miles traveled for light duty vehicles only in 2012. Light Duty vehicles include all passenger cars and light trucks and exclude large trucks and busses in FHWA vehicle classes 4-13. Figures 2 and 3 both reveal that in 2012, the significant majority of the 83,879 lane miles, 72%, were in the rural areas and 28% in urban areas throughout the state. The opposite is true of the average daily vehicle miles traveled. For all vehicles in 2012, the average daily vehicle miles traveled had 70% of the statewide miles traveled in urban areas and 30% in rural areas. This is nearly the same result for light duty vehicles with 72% of the statewide daily miles traveled in urban areas and 28% in rural areas.

Typically, the lane miles in the state do not change significantly year over year, but different counties urban and rural areas lane miles can fluctuate some year to year. Sometimes lane miles are re-categorized from rural to urban or vice versa, or road policy changes set at the local level can reduce certain lanes for various purposes. Figure 4 provides the statewide lane miles and daily vehicle miles traveled for years 2011 through 2013 for all vehicles and light duty vehicles only. Total lane miles were 83,743 miles in 2011. Lane miles increased minimally to 83,879 in 2012 and fell 1.7% in 2013 to 82,447 miles. The year-over-year decline in lane miles in 2013 was only in rural areas. Urban areas' lane miles increased 7.6% over the same period. Generally, lane miles have not changed much over the past three years.

Figure 3: Map of 2012 Urban and Rural Areas' Lane Miles and Average Daily Vehicle Miles – Light Duty Vehicles

2012 Urban and Rural Road Miles and Light Vehicle Traffic



Daily vehicle miles traveled (DVMT) is a key component in the annual calculation of our statewide vehicle miles traveled (VMT). Given the flat nature of our recent statewide VMT history, it is not surprising that DVMT also has not changed much over the past three years. In 2011, total statewide DVMT was 156.07 million miles and fell to 155.1 million miles in 2012. It rose back to 156.74 million miles in 2013. The urban areas' total DVMT shows the same trends as the statewide DVMT for the past three years. As expected, King county urban area had the highest DVMT in the state at 40.497 million miles, which represented nearly 36% of total urban areas' DVMT statewide in 2013. Rural areas' DVMT experienced a steady decline over this three year period. In 2011, rural areas' total DVMT was 46.58 million miles. In 2012, DVMT fell to 46.3 million miles and, in 2013, DVMT fell, year-over-year by 7.5% to 42.8 million miles. This declining rural DVMT may be due to more people commuting longer distances and driving on urban areas roads to go to work or to conduct other personal business. Also, the declining rural DVMT could be a function of the declining rural lane miles. This same declining DVMT over the past three years in rural areas for all vehicles is also seen in the light duty DVMT as well.

Figure 4. WSDOT Total Lane Miles and Daily Vehicle Miles Traveled All Vehicles and Light Duty Vehicles 2011-2013.

Fiscal Year	Total Miles Statewide	Total Daily Vehicle Miles Traveled (DVMT)	Light Duty DVMT
2011	83,743	156,069,006	139,021,232
2012	83,879	155,089,000	138,396,292
2013	82,447	156,743,000	141,442,054

1 Light Duty Vehicles includes passenger cars and light trucks and excludes large trucks and busses in FHWA vehicle classes 4-13

Rural and Urban Areas – Voice of Washington State (VOWS) survey

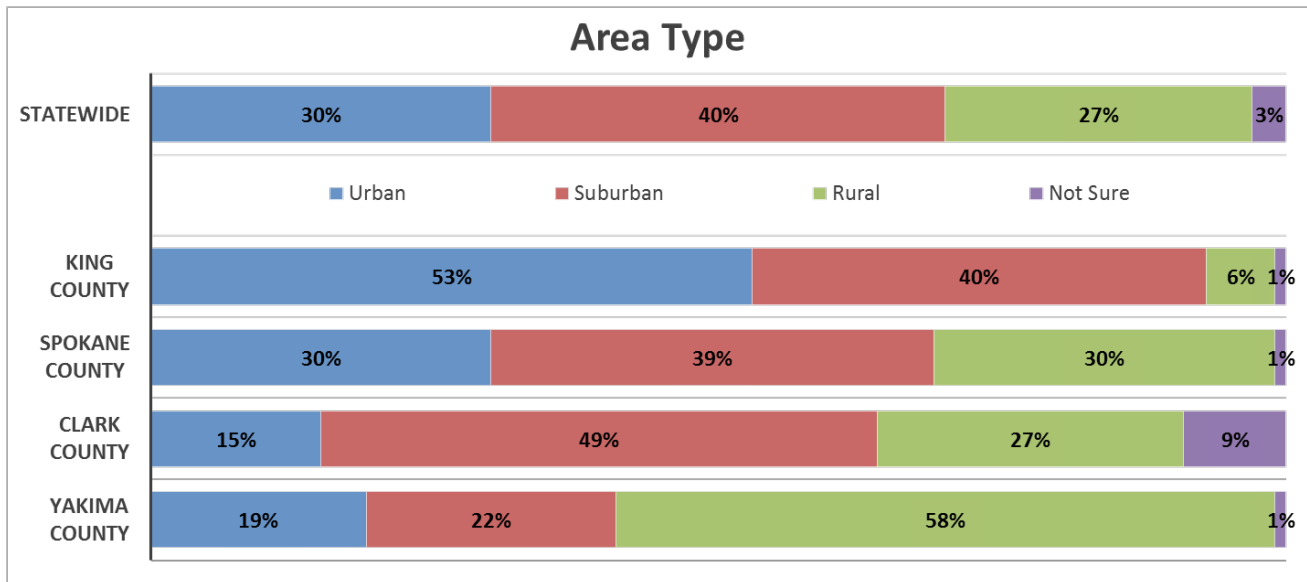
Respondents were asked to classify their local living area into Urban, Rural, Suburban or Not Sure based on their own definition using the following question:

Question: “Would you describe the area you live in as

1. Urban
2. Rural
3. Suburban
4. Not Sure

No further information or definitions were offered to the respondent to answer this question. Rather, the question was designed to identify where the respondents perceived they lived based on their own criteria of Urban, Suburban, and Rural.

Figure 5. Breakdown of VOWS Survey Respondents Self Classification Results: Urban, Rural, Suburban, Not sure.





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A-21

**PROJECT 2A: STUDY OF INTERJURISDICTIONAL
RUC ISSUES, FINAL REPORT**

Western Road Usage Charge Consortium // October 2014

 **WA RUC**



Western Road Usage Charge Consortium

Project 2A: Study of Inter-jurisdictional Road Usage Charge Issues

Final Report

**Prepared by D'Artagnan Consulting
31 October 2014**



Project 2A: Study of Inter-jurisdictional Road Usage Charge Issues

Final Report

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Project 2A: Study of Inter-jurisdictional Road Usage Charge Issues

Final Report

Executive Summary

The Western Road Usage Charge Consortium (WRUCC) carried out this study of inter-jurisdictional road usage charging on behalf of member state departments of transportation, including the Washington State Department of Transportation (WSDOT) as lead participant and the state DOTs of California, Colorado, Montana, Oregon, and Texas as joint funding partners.

The objective of this study was to develop and analyze approaches that jurisdictions can consider for charging motorists from other jurisdictions (“visitors”) for road usage, alone and in cooperation with other jurisdictions. The results of the study include enumeration of a wide range of policy alternatives and corresponding operational concepts for charging for road usage by visitors, as well as approaches for multi-state collaboration in the reporting of visitor data, collection of charges, and reconciliation of revenue. In creating and analyzing alternatives, this study considered two perspectives:

- *Individual motorists*, including motorists adopting automated (e.g., in-vehicle devices) and manual (e.g., odometer readings or distance licenses) approaches to road usage charge reporting and payment.
- *Jurisdictions*, which can adopt bilateral or multilateral approaches for data reporting, charge collection, and revenue reconciliation.

This final report brings together into one document the key results and outcomes of the study as summarized below.

- First, the report presents unique issues raised by each participating state at the outset of the study, including a summary of cross-jurisdictional road facilities, existing policies and administrative programs that address cross-border travel by light vehicles, and major border population centers.
- Next, the report outlines five policies and three combinations of policies (a total of eight alternative policy approaches), for assessing charges on visitors for road usage. The list below briefly summarizes these eight alternative policy approaches.
 1. No charge. Visitors do not pay anything for road usage.
 2. Shadow charge. Visitors do not pay anything for road usage, but jurisdictions exchange funds to reflect differences in cross-border travel volumes and tax rates based on mutually agreed methodologies to measure or estimate cross-border travel.
 3. Charge based on fuel consumption. The host jurisdiction imposes a tax on fuel purchased by visitors, as is done today across North America. The tax may or may not also apply to residents.
 4. Charge based on time. The host jurisdiction imposes a charge on visitors based on the amount of time they access the host roadway network.
 5. Charge based on distance. The host jurisdiction imposes a charge on visitors based on the distance they travel on the host roadway network.



Project 2A: Study of Inter-jurisdictional Road Usage Charge Issues

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6. Distance-based, with shadow charges. The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets), but uses shadow charging for vehicles that opt for manual or non-location-based distance reporting in their home jurisdictions.
 7. Distance-based and fuel-based, with or without shadow charges. The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets), but uses fuel taxes for all other visitors.
 8. Distance-based and time-based. The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets) and time-based charging for all other visitors.
- The report goes on to describe simplified operational concepts for each of these eight alternatives. Operational concepts describe the measurement, reporting, and revenue collection mechanisms which could be employed to implement each policy, focusing on the motorist's perspective (i.e., what are the reporting and payment options for individual motorists under each policy alternative?).
 - In addition, the report summarizes approaches for reporting and reconciling payments between (bilaterally) or among (multilaterally) jurisdictions. For multilateral reporting and reconciling, the report contrasts the "mesh" approach (a network of bilateral agreements among jurisdictions) and the "star" approach (a single, centralized hub which manages all reporting and reconciliation, with one connection to each jurisdiction).
 - Lastly, the report highlights enforcement issues and challenges associated with each policy alternative for assessing charges on visitors.
 - The report concludes with a summary matrix of policy alternatives, descriptions of individual reporting and payment options for each policy, and bilateral and multilateral jurisdiction reporting and reconciliation options.

The policy alternatives presented in this report are neither exhaustive nor prescriptive. They provide a range of approaches to addressing visitors in a multi-jurisdictional RUC environment and illuminate possible frameworks for implementing RUC in a cooperative multi-jurisdictional way. Not all of the alternatives are desirable or even feasible in many jurisdictions, few are appropriate for implementation at the present time, and no single alternative should be seen as a final solution. Rather, jurisdictions can consider each alternative at various points in time, with evolving policies and concepts as the jurisdictions move individually and collectively toward implementation of RUC.

Next steps in WRUCC's development of inter-jurisdictional RUC include addressing questions such as: are the revenue gains from multi-jurisdictional RUC worth the cost of implementation, how do RUC states address international travel (i.e., Canada and Mexico), and how might existing agency programs be adapted to support implementation of multi-jurisdictional RUC?



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1 Introduction

The Western Road Usage Charge Consortium (WRUCC) carried out this study of inter-jurisdictional road usage charging on behalf of member state departments of transportation, including the Washington State Department of Transportation (WSDOT) as lead participant and the state DOTs of California, Colorado, Montana, Oregon, and Texas as joint funding partners.

How should visitors from out of state be treated under a RUC system? Requiring visitors to pay RUC will require special systems that potentially add to the cost of implementation and operation. This study has developed and analyzed a range of policies and operational approaches for one or more jurisdictions to assess, collect, and reconcile RUC collected from visitors.

Under the current fuel tax system, passenger vehicles using liquid, carbon based fuel for highway travel pay the federal motor fuel tax, regardless of where the driver lives, or where in the U.S the fuel is purchased. In addition, all states levy state fuel taxes, and some jurisdictions also levy regional and local fuel taxes. To date, this approach has been a generally acceptable method of collecting roadway taxes from drivers regardless of their state, city, or county of residence. Fuel has been seen as a surrogate for distance travelled or road usage.

Furthermore, the federal and state/local fuel tax collection system is indifferent to how many miles are actually driven within the taxing jurisdiction. For example, a driver of a family sedan that refuels in Moscow, Idaho (a town near the Idaho/Washington border) who then travels to Spokane, Washington and back will have driven 160 miles—156 miles on Washington state highways—but will have paid fuel taxes only to the state of Idaho and to the federal government, and none to Washington.¹

Even though Washington receives no distribution of fuel taxes collected by Idaho, this tax system has been deemed generally acceptable on grounds that the system works both ways: drivers refueling in Washington may similarly drive many miles on Idaho roadways without direct remuneration to the Idaho highway fund. Except in a few extreme cases (such as border towns like Point Roberts, Washington where Canadians may travel with the exclusive objective of purchasing fuel at U.S. prices, then return to their homes in British Columbia), the general public does not perceive or complain of any inequities in this roadway funding system.

¹ This is not the case for interstate commercial vehicles over 26,000 pounds, which must report fuel consumed and distance traveled by jurisdiction to the International Fuel Tax Agreement (IFTA) administrators of their home jurisdictions on a quarterly basis, including payment or refund for fuel taxes owed. Jurisdictions then reconcile the fuel taxes owed by each vehicle to each jurisdiction through a clearinghouse run by IFTA, Inc.



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By contrast, early indicators show that elected officials and the general public are troubled by the notion that under a RUC system, visitors may not be charged for use of a host state's roadways. Indeed, the opportunity for visitors into a RUC jurisdiction to buy tax-free fuel and pay no additional fees to use a roadway could potentially entice tax evasion in both jurisdictions. This "visitors drive free" scenario may or may not materialize, depending upon the policies, tax systems, and reciprocity agreements established within and between the various jurisdictions. However, unless provisions are made to address this issue, it could impair public acceptance of a RUC system.

The objective of this study was to develop and analyze approaches that jurisdictions can consider for charging motorists from other jurisdictions ("visitors") for road usage, alone and in cooperation with other jurisdictions. The results of the study include enumeration of a wide range of policy alternatives and corresponding operational concepts for charging for road usage by visitors, as well as approaches for multi-state collaboration in the reporting of visitor data, collection of charges, and reconciliation of revenue. In creating and analyzing alternatives, this study considered two perspectives:

- *Individual motorists*, including motorists adopting automated (e.g., in-vehicle devices) and manual (e.g., odometer readings or distance licenses) approaches to road usage charge reporting and payment.
- *Jurisdictions*, which can adopt bilateral or multilateral approaches for data reporting, charge collection, and revenue reconciliation.

For purposes of this report, we adopted the following terms and definitions:

- *Home jurisdiction*: the jurisdiction in which a vehicle is registered.
- *Visitor*: registered owner or lessee of vehicle(s) traveling outside the home jurisdiction.
- *Host jurisdiction*: jurisdiction in which a visitor travels.
- *Reconcile*: process of balancing two accounts, including calculation and payment of charges or refunds. We discuss two types of reconciliation:
 - *Individuals* reconcile the amount of charges paid with the amount of charges owed to all jurisdictions (home and hosts). Home jurisdictions or private account managers handle payments and refunds.
 - *Jurisdictions* reconcile the amount of charges collected from motorists with the amount owed by motorists. Additional payments or refunds are handled directly with other jurisdictions or through a clearinghouse.
- *Clearinghouse*: an entity that calculates reconciliation and, optionally, handles reconciliation payments among two or more jurisdictions.
- *Undifferentiated*: method of distance measurement that does not allocate distance by location but rather records all distance traveled.



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- *Shadow charge*: a charge on one entity that is paid by another entity.

This final report brings together into one document the key results and outcomes of Tasks 2.1 and 2.2, and provides some conclusions. Chapter 2 presents the key issues for multi-jurisdictional RUC as identified by state DOTs participating in this study. Chapter 3 outlines the various policy alternatives and associated operational concepts for charging visitors in host jurisdictions in a multi-state RUC environment, and includes an overview of enforcement considerations for the eight policy alternatives. Finally, Chapter 4 comprises conclusions and proposed next steps.

In considering the policy alternatives and concepts presented in this report, it must be remembered that this is a tax policy. As such, exactness or specificity should be eschewed, particularly in early stages of a long-term evolution. In much of our tax policy, we set general rules or approximations. This was specifically cited in New Zealand by a special independent review board appointed by the Transport Minister to review the nearly 40-year-old Road User Charging System and make specific recommendations on changes or modifications. The review, much like this report, focuses on achieving a good balance between developing a highly accurate tax policy and keeping things simple and straightforward. In researching examples of other RUC programs, the New Zealand review board cited several initial trade-offs that would be required in any RUC system. One of these was simplification versus accuracy. For example, a better level of accuracy in cost allocation would create an overly complicated model. This would also imply a higher degree of accuracy than can be obtained in any allocation basis. Accordingly, a degree of averaging has to apply. To quote from the report:

“A good charging system should not be discarded in the pursuit of a perfect system. The policy aim should be for a system that accomplishes as many and as much of the objectives as possible at low cost and, from a dynamic perspective, is not so complicated that different parties are constantly tempted to chip away at various components and undermine it”

The above point is not lost on this report. Any policy option can be made complex by trying to achieve too great a level of detail. Instead, we seek to balance simplicity and accuracy. The several policy approaches detailed in this report are intended to provide a range of approaches along that continuum with respect to the problem of out-of-jurisdiction travel under a RUC policy. The evolution of policy thinking from concept to functional to pre-operational and finally operational reality can be achieved through intelligent and thoughtful design in the program and through an incremental approach established by each jurisdiction. It will also help inform and educate key decision makers, key stakeholders, and the public about desirability of various policy alternatives that could underpin future system designs.



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2 Unique Issues of Participating Jurisdictions

This section summarizes unique issues related to travel on state roads by visitors as related by representatives of participating states and reported in Task 2.1.

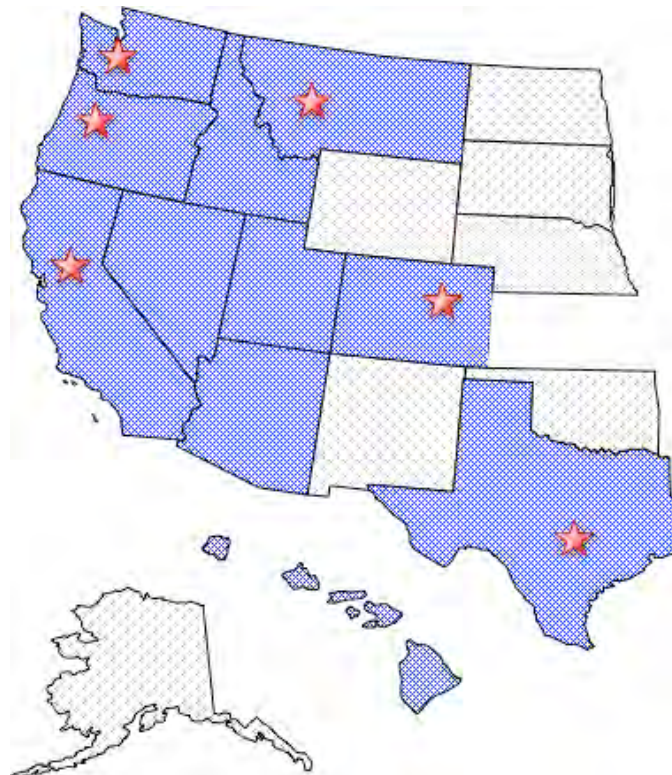
2.1 Participating jurisdictions

Shaded states in the map below indicate Western RUC Consortium members, and stars indicate jurisdictions participating in this study: Washington, Oregon, California, Texas, Colorado, and Montana. At the outset of this study, representatives of each jurisdiction provided answers to a range of questions regarding their unique policies and needs from this study. Questions included the following:

- Are there any policies, programs, or regulations in place that could form part of a future policy for charging visitors for road usage in your state?
- What is the typology of border crossings between your state and its neighbors?
- What are unique challenges facing your state relative to the issue of travel by visitors?

The subsequent sections summarize responses of each state.

Figure 2-1 Participating jurisdictions





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2.2 Policies regarding visitors

The participating states provided a range of existing policies relating to visitors. The purpose of reviewing these policies was to see which policies, if any, could provide useful bases or extensions for future policies to charge for road usage by visitors. Since this study is looking exclusively at light vehicles, it does not consider any policies related to heavy trucks (defined as >10,000 pounds gross vehicle weight rating, or GVWR).

2.2.1 Resident vehicle registration requirements

All states require visitors to register their vehicles with the state once they establish residency and/or become employed in the state, but states have different time requirements for vehicle registration ranging from immediately (Montana) to within 30 days (Oregon). No state indicated any policies requiring visitors to register their vehicles except for Oregon, which does so after 6 months.

2.2.2 Nonresident vehicle registration requirements

In the U.S., all states require that residents register their motor vehicles within the state. Many states also require non-residents to register their vehicles in certain circumstances. WRUCC member states including California, Texas, Montana, and Arizona require that non-residents employed within the state register their vehicles with the state. Other states, such as Washington, Oregon, and Utah, require employment within the state and another “substantial step” that falls short of residency before any registration requirement kicks in. A substantial step may be living in the state for a specified duration (e.g., six months) while maintaining residency in another state, paying in-state tuition, or enrolling children in local schools. Other schemes base registration on the amount of time the vehicle is present in the jurisdiction. Although not a WRUCC state, Maryland, for example, requires registration if a vehicle is present within the state for a period of 60 days or more, notwithstanding residency or employment. This could be a useful policy example for future consideration.

Because of interstate travel and these additional registration requirements, there are often situations where dual registration is required. For example, individuals living in Arizona but working in California are required to register their vehicle in both states. In the event that dual registration is required, the corresponding registration taxes and fees must be paid in both states and two sets of license plates must be carried. Only one set must be displayed, and the plates do not need to be changed as the vehicle crosses between states.

States have enacted three different types of legislation aimed at non-residents to account for the disparity in infrastructure use between states where dual registration is required. The first type of legislation requires registration but at a reduced fee for “nonresident daily commuters.” Both California and Arizona permit employees from a contiguous state to obtain from the state of employment a small decal (approximately 4” x 4”) for a nominal fee (California: \$15, Arizona: \$33) in lieu of registration, if the vehicle is not brought more than 30-35 miles past the border,



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and the contiguous state offers similar benefits to residents of the state of employment. Note that this program does not require an agreement between states. Residents of states such as Oregon and Nevada may still participate in this program even though their home state does not have an explicit program because there is no employment registration requirement in Oregon and Nevada, thereby automatically conferring reciprocal benefits on residents of, for example, California.

The second type of legislation makes nonresidents completely exempt from any registration requirements only if the state in which the nonresident resides has entered into an agreement with the state the nonresident enters into, which confers the same benefits upon residents of the state that the nonresident enters. No decal is required and there is no mileage limitation. Wyoming and Illinois both have legislation authorizing such agreements, but it does not appear that any agreements have been entered into.

The third type of legislation prorates registration for temporary employment cases of more than 30 days but less than one year. Montana appears to be the only state that uses this program. For short-term employment, most states will issue a temporary registration that allows a vehicle to operate within the state for a limited time (usually less than 30 days). Unlike the previous two types of legislation, which implicitly assume offsetting use and fees by residents in another state, these types of programs recognize that paying a year's worth of registration fees may overcharge a temporary nonresident for the use of the infrastructure. These programs are akin to a time permit, where upon payment of a fee by the vehicle owner, a state issues a permit for a specified duration allowing non-registered vehicles legal access to public roadways.

Administration and enforcement of these programs and agreements raise many challenges. First, many nonresidents may be unaware that they must register their vehicles in a second state. Second, the programs that afford nonresidents an opportunity to avoid paying full registration costs are poorly publicized. While some people are aware of the registration requirement, many are unaware of these programs that create exceptions. Lastly, it is almost impossible to differentiate between those who must register, those not required to register, and those who are simply avoiding their obligation. Aside from a comprehensive investigation by law enforcement, enforcement is limited. California has led the charge in targeting registration violators by creating a "Cheaters" program, which solicits voluntary tips from citizens when they become aware of residents and nonresidents alike violating one of the registration laws.

These examples of existing policies, program administration, and enforcement are a few examples that could someday form both a policy and organizational basis for a multi-jurisdictional RUC program.



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2.3 Roads crossing jurisdictional boundaries

The table below provides a high-level summary of the number and types of roads crossing jurisdiction boundaries from each state.

Table 2-1 Jurisdictional boundary roadways

State	Interstate	Other Highways	Other Roads and Local Streets	Total
California	6 (1 int'l)	26 (5 int'l)	156	188
Colorado	6	35	283 (19 paved)	324 (60 paved)
Montana	5 (1 int'l)	12 (3 int'l)	135 (9 int'l)	152
Oregon	5*	19	67	93
Texas	7	105 (28 int'l)	155	267
Washington	5 (1 int'l)*	19 (6 int'l)	14	38

Notes:

1. *int'l* = international
2. *Each of the 3 Interstate highway crossings between Oregon and Washington consists of two one-way bridges, but each is counted as one crossing.

2.4 Other special considerations

States reported several common issues, as summarized below:

- States collect fuel taxes at the distributor and/or terminal rack level, “upstream” from the pump and retail customers. This method, whereby fuel importers, wholesalers, and refiners pay the tax, allows states to collect taxes from a smaller number of taxpayers. The only exception to this is Oregon, where fuel sellers also collect diesel tax at the retail level.
- All participating states have substantial cross-border travel, including mid- to large-size metropolitan areas which tend to have unbalanced commuter flows from one direction to the other (e.g., the majority of commuters in Portland, OR-Vancouver-WA that cross the border live in Washington and work in Oregon):
 - Oregon-Washington
 - Portland, OR-Vancouver, WA
 - Milton-Freewater, OR-Walla Walla, WA
 - Rainier, OR-Longview, WA
 - Oregon-Idaho
 - Ontario, OR-Boise, ID
 - California
 - San Diego, CA-Tijuana, Mexico
 - Lake Tahoe, CA-NV



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- Montana
 - Eastern Montana-Western North Dakota (energy traffic, including commuters)
- Texas
 - Texarkana, TX-AR
 - El Paso, TX-Las Cruces, NM-Juárez, Chihuahua
 - Del Rio, TX-Acuña, Coahuila
 - Eagle Pass, TX-Piedras Negras, Coahuila
 - Laredo, TX-Nuevo Laredo, Tamaulipas
 - Lower Rio Grande Valley, TX-Tamaulipas

In addition, there were several issues unique to one or several participating states:

- Montana has a large number of fuel tax refunds particularly due to agricultural sector, amounting to \$2.9 million, or approximately 1.5% of total state fuel tax collections of \$200 million per year.
- Oregon, Washington, and Montana provide web-based, self-issued trip permits for heavy vehicles. Although this memorandum is not addressing heavy vehicles, awareness of such permit systems could be useful should a state adopt a similar approach for light vehicles.
- California has agriculture inspection points near major border crossings. The purpose of these inspections is to ensure compliance with quarantine and agriculture policies.
- At least one metropolitan planning organization (MPO) in Texas (Texarkana) provides for some regional revenue sharing based on the traffic flows across state borders in the region.
- With the exception of Utah, none of Colorado's neighbors is participating in WRUCC.



3 Policy Alternatives and Operational Concepts for Charging Visitors

Given the connectivity among states as evidenced by border metropolitan areas and crossing points, and given the lack of existing mechanisms for administering inter-jurisdictional revenue collection for light vehicles, RUC may require new multi-jurisdictional policies and operations. This chapter outlines potential policy and operational alternatives for charging visitors in a multi-jurisdiction RUC environment. Section 3.1 provides a summary of the five policy bases and three combinations of policies as portrayed in previous memoranda. Section 3.2 describes (for each policy basis) the corresponding operational concept alternatives including relevant reporting and payment options for individual motorists. Sections 3.3 and 3.4 cover bilateral and multilateral jurisdiction reporting and reconciliation alternatives, respectively, for each policy alternative. Lastly, section 3.5 outlines enforcement considerations for each policy alternative.

3.1 Summary of policy alternatives for multi-jurisdictional road usage charging

The table below summarizes five policy bases and three combinations of policies that a jurisdiction could use to charge visitors.

Table 3-1 Summary of policy bases for multi-jurisdictional RUC

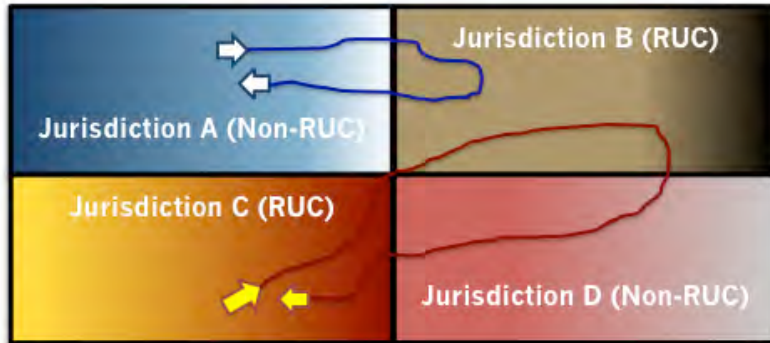
Policy Basis	Description of Policy Basis
1. No charge	The host jurisdiction does not charge visitors for road usage.
2. Shadow charge	The host jurisdiction does not charge visitors for road usage, but measures or estimates their usage as the basis for a reconciliation of funds collected by the visitor’s home jurisdiction. For example, this could apply for visitors with a manual (e.g., odometer-based) RUC reporting option in their home jurisdiction. It could also work in conjunction with a fuel-based charge.
3. Charge based on fuel consumption	The host jurisdiction imposes a tax on fuel purchased by visitors. The tax may or may not also apply to residents.
4. Charge based on time	The host jurisdiction imposes a charge on visitors based on the amount of time they access the host roadway network.
5. Charge based on distance	The host jurisdiction imposes a charge on visitors based on the distance they travel on the host roadway network.
6. Distance-based, with shadow charges	The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets), but uses shadow charging for vehicles that opted for manual or non-location-based distance reporting in their home jurisdictions.
7. Distance-based and fuel-based, with or without shadow charges	The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets), but uses fuel taxes for all other visitors.
8. Distance-based and time-based	The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets) and time-based charging for all other visitors.



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Each section that follows describes each policy alternative in more detail. In addition, each section includes an illustration of the policy basis using four notional jurisdictions illustrated below.



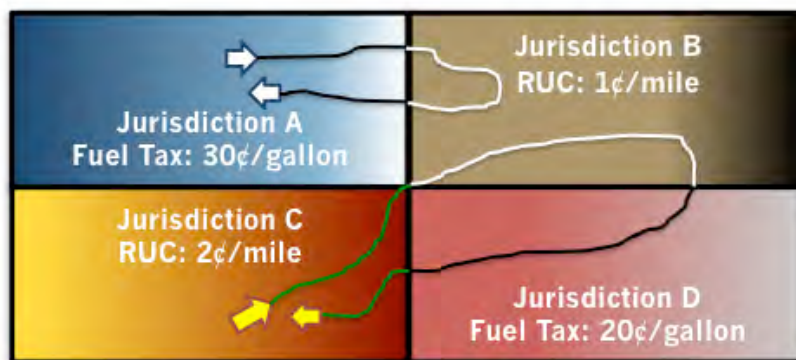
In the image at left, jurisdictions B and C impose RUC on their residents, while A and D have only a fuel tax. We illustrate two journeys. The top journey involves a visitor from a non-RUC jurisdiction to a RUC jurisdiction. The lower journey involves a visitor from one RUC jurisdiction to both another RUC jurisdiction and a non-RUC jurisdiction. The

path of each journey is color coded by the policy basis of the charge being paid by each visitor. The legend at right summarizes the type of policy indicated by each path.

- No charge
- - - - - Shadow charge
- Fuel-based charge
- Time-based charge
- Distance-based charge

3.1.1 Policy alternative 1: No charge

Under this alternative, a jurisdiction with RUC for its own residents and without fuel tax collected at the terminal rack could simply not charge visitors. This policy alternative is mutually exclusive with all other alternatives.



Under RUC, a state could choose to ignore any miles traveled by visitors. The advantages of this policy are that (1) there is no administrative or enforcement cost to the state, and (2) there is no burden or cost placed on visitors to comply.

However, this approach has several disadvantages. First, visitors do not contribute revenues despite imposing costs. Secondly, the imbalance in tax treatment between visitors and residents could be a constitutional (Commerce Clause) issue. Thirdly, such a policy could exacerbate fuel tax arbitrage, a strategy by which motorists aim to purchase most of their fuel in low-cost (in this case, no-tax) jurisdictions, despite driving elsewhere. For example, motorists



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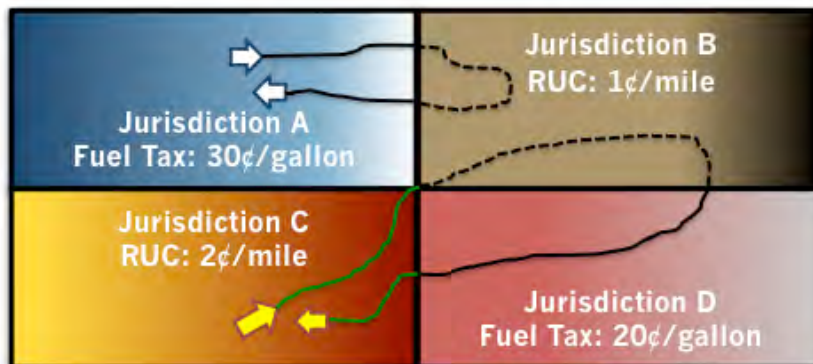
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fueling up in jurisdiction B but driving in D are not paying any tax to any jurisdiction. Finally, it causes taxes to fall on the wrong people. For example, those fueling up in jurisdiction A while traveling in B are paying tax to the “wrong” jurisdiction (i.e., tax paid to A on fuel used to drive in B). Similarly, a visitor from jurisdiction C who pays undifferentiated RUC would be “double taxed” if purchasing any fuel in jurisdiction D and driving in C (fuels tax paid to D and RUC paid to D for the same miles).

If administering a multi-state reporting and monitoring administration proves too costly and/or if the balance of traffic between any two jurisdictions is relatively even, there may be a compelling case not to charge visitors. However, when these conditions are not met, it is important to consider other alternatives such as the alternatives presented below.

3.1.2 Policy alternative 2: Shadow charge

A *shadow charge* refers to the notion that, while the visitor makes no payment and incurs no administrative burden, the jurisdiction will nonetheless attempt to measure or approximate travel by visitors and perform a reconciliation with neighboring states



on the basis of measured or approximated travel data. In the example illustrated at left, jurisdictions A and B would attempt to reconcile based on the measured or estimated travel of the traveler between those two jurisdictions. Suppose the trip by the resident from jurisdiction A in jurisdiction B was 100 miles. At \$0.01 per mile, jurisdiction A owes jurisdiction B \$1.00. The amount of miles would either be estimated or measured approximately by monitoring

the roadways—in either case using a methodology mutually agreed by the states. The motorist herself would not have to report any miles or make any payment. This policy option can be coupled with other policies, in particular for visitors who opt for distance-based charges in their home state but do not differentiate miles driven by jurisdiction.

The motivation for using this approach is that it addresses some of the flaws of the “no charge” policy—namely, when there is an imbalance of flows between jurisdictions (i.e., the case where tax is paid to the “wrong” jurisdiction). For example, if Oregon and Washington can use reliable, mutually-agreeable data and metrics to calculate miles traveled by visitors from one state to the other, while also accounting for any differential in RUC rate between the two states, they could



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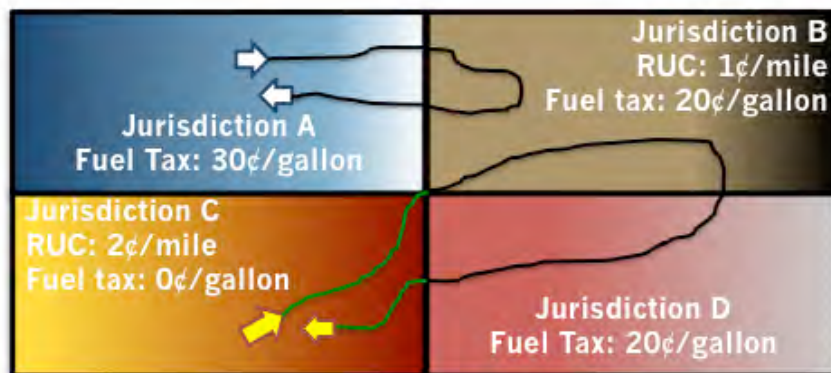
theoretically calculate the approximate amount of the imbalance and settle it between jurisdictions without requiring any recourse to individual motorists.

From the perspective of a visitor, this policy is the same as not charging at all. However, from the perspective of the jurisdiction, it implies additional administrative responsibilities, accounting, and reconciliation of funds owed on a recurrent basis. This policy is a distinct policy from all the others presented in this section: unlike the “no charge” alternative, it attempts to address visitors; while unlike the remaining alternatives, it addresses visitors without directly requiring any payment by individual motorists.

Still, it has several disadvantages. First, visitors do not contribute revenues despite imposing costs. Again, this could create a constitutional issue due to the disparate tax treatment between residents and visitors. In addition, the source of funds for the reconciliation of shadow charges must come from another source. In the example above, jurisdiction A must pay jurisdiction B out of fuel tax, general funds, or using some other mechanism. The result is that residents of A subsidize visitors going to B. Finally, there may be an imbalance between states with RUC to the extent they have varying per-mile rates, and any jurisdictions that agree to using shadow charges will need to consider this difference in their reconciliation agreements.

3.1.3 Policy alternative 3: Charge based on fuel consumption

Should a jurisdiction with RUC for its own residents desire to charge visitors directly, one readymade option is the fuel tax. All states in the U.S. collect fuel taxes, most at the terminal rack, including the states participating in this study. Should fuel taxes continue to be collected in this manner, with the price passed to the consumer, this is one way to capture revenue from visitors.



There are numerous advantages of a fuel tax approach to charging visitors. First, the policy and administration are familiar and straightforward. All states have existing bureaucracies dedicated to fuel tax collection, compliance, and accounting. Consequently, the marginal cost of this approach is zero. Secondly, it requires no action on the part of visitors,

yet they still contribute something for their use of the roads, even if the contribution does not precisely match the level of usage, except for visitors whose vehicles do not consume taxable fuel (e.g., electric vehicles).



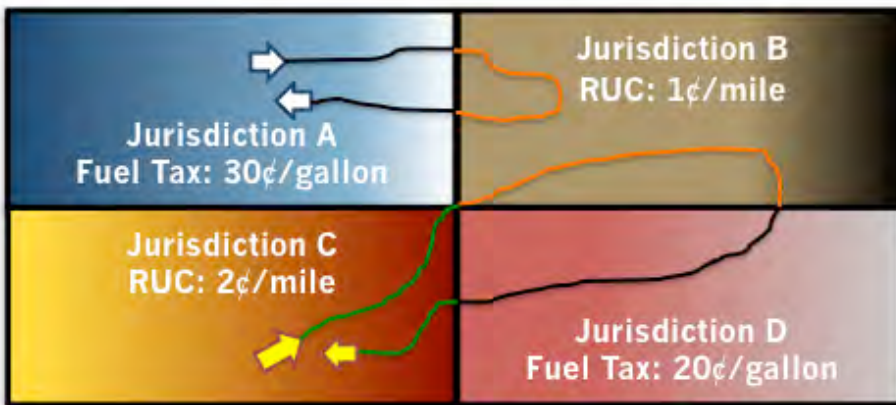
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There are several disadvantages to this approach. The possibility exists for some visitors to pay little or no fuel tax—for example, by purchasing fuel in another state before traveling. However, this phenomenon occurs today without any apparent concern or remediation by the states, likely due to an assumption of balanced revenues lost and gained. Secondly, for those visitors who do purchase fuel, the fuel tax does not capture revenue equitably from highly fuel-efficient vehicles. For example, a plug-in hybrid using little or no fuel pays little or no fuel tax in states visited. This phenomenon is the driving force behind much of the activity to look at RUC in states, so it may likewise be important from a policy perspective to address highly fuel-efficient vehicles belonging to visitors, which the fuel tax does not. Thirdly, small, pass-through jurisdictions may not be able to capture fuel tax revenue from visitors, although this is less a concern in WRUCC states.

3.1.4 Policy option 4: Charge based on time

In lieu of a fuel tax, jurisdictions might consider a time-based charge, also known in Europe as a *vignette*. A *time-based charge* would require any visitor to pay for time spent on roads in the host jurisdiction in exchange for unlimited travel in the host jurisdiction during that time period. There are numerous ways to implement this policy and for varying lengths of time (e.g., 1 day, 1 week), but the fundamental concept is to charge visitors for entry on a time basis rather than based on



distance traveled or fuel consumed. This has become a preferred policy option for several European countries as a means to charge visitors a fee for road usage.

Time-based charges are relatively cost-effective to administer and do not necessarily require any technology for the visitor. Moreover, a

precedent for such charges may exist in states such as California, Nevada, Arizona, and Oregon, in that these states require non-resident employees to purchase a visitor registration permit in order to commute, which would be quite similar to a charge based on time for visitors.

There are several disadvantages to this option. First, the host jurisdiction must create and operate some form of time permitting system either alone or in combination with other jurisdictions. Secondly, evasion opportunities would be numerous, so enforcement would need



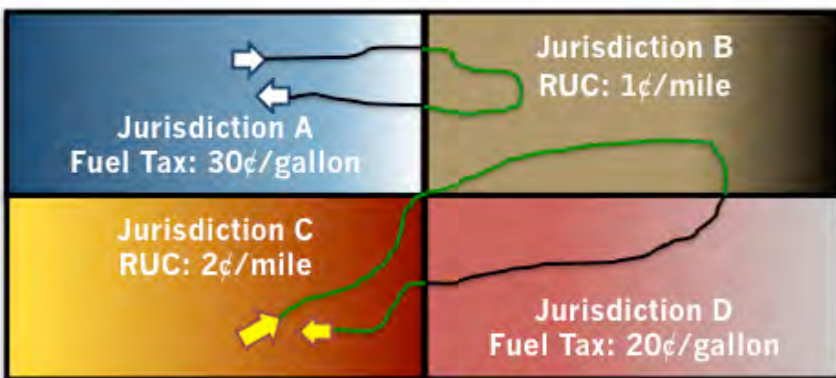
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to be carefully planned and implemented for maximum effectiveness. Thirdly, time-based charges generally do not reflect actual costs imposed by visitors. Finally, fuel tax arbitrage remains an opportunity, which is a potential detriment to those states that rely only on fuel taxes for visitor revenue.

3.1.5 Policy option 5: Charge based on distance

Under this option, *the host state would require all visitors to report distance travelled as the basis for paying a tax.* There is precedent for this option. Heavy vehicles effectively pay for road usage based on distance through IFTA, which converts fuel taxes into mileage-based taxes owed to all



states visited. Conceptually, it is not a divergent policy to require visitors to pay a distance tax, particularly if locals are also required to pay it. The methods of implementation may vary, but the fundamental policy is to charge based on distance, rather than time spent or fuel consumed.

For a state with RUC, this resolves the constitutional issue of different treatment of visitors vs. residents.

Also, it removes any revenue distortions such as those associated with fuel taxes and time-based charges.

However, distance-based charges for visitors may lead to administrative and enforcement challenges. Collecting distance-based charges from visitors equipped with location-based distance reporting is straightforward, but no jurisdiction is contemplating a GPS mandate for RUC, so any distance-based charge on visitors must consider alternatives for unequipped vehicles. It is highly unlikely that any jurisdiction will ever require such visitors to report every trip made into a host jurisdiction. Enforcement and evasion become a major issue for visitors without location-based RUC measurement devices.

3.1.6 Policy option 6: Distance-based with shadow charges

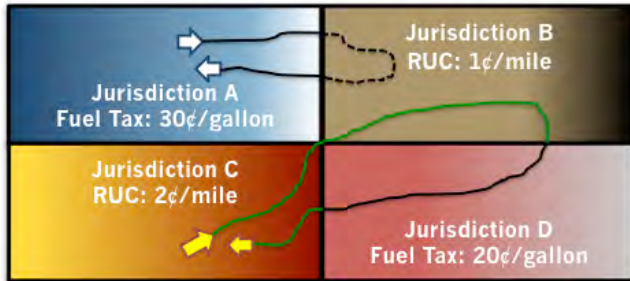
Under this combination, visitors equipped with the ability to differentiate distance by location would report and pay for road usage based on distance traveled. This combination assumes no fuel tax in place. Those without differentiated distance (i.e., GPS devices to measure RUC) would continue paying either undifferentiated RUC or fuel taxes to their home jurisdiction. These undifferentiated RUC payments could be reconciled using shadow charges, based on



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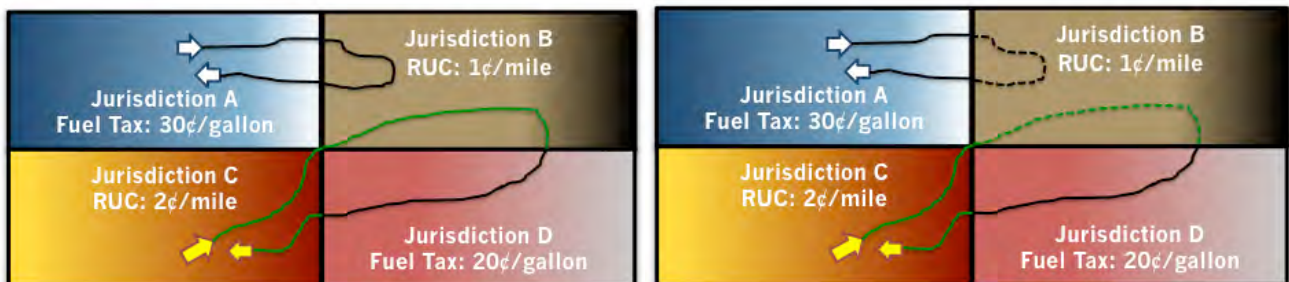
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approximated aggregate mileage traveled in each jurisdiction, using an estimation methodology or model agreed mutually by participating states. This option has the advantage that it does not impose any additional RUC reporting requirements for any visitors beyond those of their home state. However, it could allow some residents to engage in arbitrage, for example by choosing an undifferentiated reporting method for their home state, knowing that neighboring states have higher RUC rates. In effect, such individuals would be underpaying to neighboring states.



3.1.7 Distance-based and fuel-based, with or without shadow charges.

Under this combination, visitors equipped with the ability to differentiate distance by location (i.e., those with location-based RUC measurement devices) would report and pay for usage based on distance traveled, while receiving fuel tax refunds. All other visitors would continue paying fuel taxes. In this scenario, states could optionally include shadow charges to allocate fuel receipts to miles traveled, using an agreed methodology or model for reconciliation. The disadvantage of this approach is that it would not work in a state that no longer collects fuel tax. Images below depict distance-based charges for the visitor from jurisdiction C and fuel-based charges for the visitor from A. Shadow charges for these trips are illustrated on the right side.



3.1.8 Distance-based and time-based

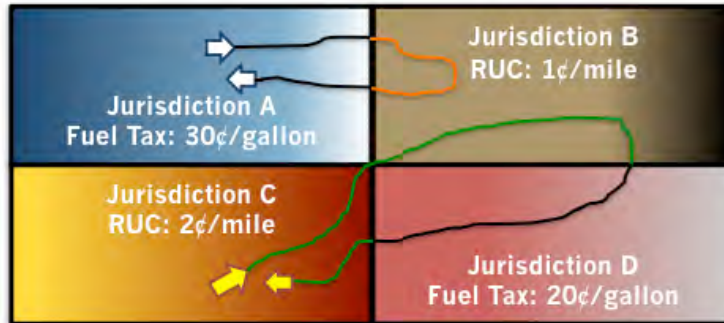
This combination once again requires visitors with differentiated distance reporting (location-based RUC measurement devices) to report and pay for actual miles traveled. Those without



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differentiated distance would be required to pay a time-based charge. The advantage of this approach is that it does not allow visitors to game the system, assuming time-based charges are set to exceed equivalent distance-based charges (e.g., the cost of a one-day time permit equals the cost of 500 miles). Under this approach, no shadow charges are required as there are no funds to reconcile. The disadvantage of this approach is that it would require two separate RUC payment systems to be administered by the host state.



3.2 Operational concepts

This table below provides a summary of the operational concepts corresponding with each policy basis.

Table 3-2 Summary of operational concepts for multi-jurisdictional RUC

Policy Basis	Operational Concepts
1. No charge	There is no corresponding operational concept for this policy, as it requires no action by either the visiting motorist or the host jurisdiction.
2. Shadow charge	There is no reporting or payment required for travel in host jurisdiction by a visitor. However, the host and home jurisdictions must agree to a measurement or estimation methodology of cross-border travel and an approach for reconciliation.
3. Charge based on fuel consumption	Collect fuel tax at terminal rack. Refund or offset fuel taxes against distance-based or time-based charges for all residents (and potentially visitors).
4. Charge based on time	Manual or electronic time permits for visitors issued for varying time increments such as one day, one week, or one month. ²
5. Charge based on distance	There are two categories of operational concept for distance-based charges on visitors: manual and electronic, summarized as follows. <ul style="list-style-type: none"> Manual operational concept: The host jurisdiction could require visitors to report and pay for all miles for each trip based on manual, self-reported trip reports.

² Several states have existing programs that effectively issue time permits to frequent visitors or commuters who live in one state but work in an adjacent state. These programs could be used as the foundation for a time-based charge.



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Policy Basis	Operational Concepts
	<p>Although this approach may be the least desirable for a variety of reasons, it is nonetheless feasible.</p> <ul style="list-style-type: none"> Electronic operational concept: The host jurisdiction allows visitors to use approved location-based methods to report miles traveled in each jurisdiction and pay their host jurisdiction the RUC corresponding to amounts owed in all states traveled. Visitor could pay the host jurisdiction directly or pay their home jurisdiction. If the latter, then a multi-state reconciliation process must be in place, which is the subject of sections 2.2 and 2.3. Note that this policy alternative is very likely unavailable for visitors who have opted for a non-technology or non-location-based reporting method in their home jurisdiction (e.g., without GPS, they cannot use an electronic method to report distance traveled in the host state), nor is it available for visitors from jurisdictions without distance-based charges, unless the host jurisdiction requires visitors to equip their vehicles with location- and distance-based reporting equipment.
6. Distance-based, with shadow charges	Combination of electronic distance-based charging with shadow charging.
7. Distance-based and fuel-based, with or without shadow charges	This concept combines electronic distance-based charging with fuel-based charging. Optionally, the host jurisdiction could also use shadow charging for visitors with non-location-based reporting from their home jurisdictions.
8. Distance-based and time-based	This concept combines electronic distance-based charging with time-based charging.

The table below summarizes options available to individual motorists (visitors) for reporting and paying RUC. The options vary depending upon the policy basis in place and the corresponding operational concept.

Table 3-3 Summary of individual reporting and payment options for each policy basis

Policy Basis	Individual Visitors' Reporting and Payment Options
1. No charge	<ul style="list-style-type: none"> Reporting: Nothing to report. Payment: Nothing to pay.
2. Shadow charge	<ul style="list-style-type: none"> Reporting: Nothing to report to host jurisdictions. However, motorists may be obligated to report travel to their home jurisdiction undifferentiated by location. Payment: Nothing to pay outside of tax obligations to home jurisdiction.
3. Charge based on fuel consumption	<ul style="list-style-type: none"> Reporting: Nothing to report. Payment: Payment of charges is done indirectly in the form of fuel taxes, which are included in the price of fuel.



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Policy Basis	Individual Visitors' Reporting and Payment Options
4. Charge based on time	<ul style="list-style-type: none"> • Reporting: Visitors must report their presence in the host jurisdiction and the length of time they intend to stay prior to or upon entry. This could be done in person, via telephone, or via Internet. • Payment: Visitors must purchase a time permit corresponding with an amount of time covering at least the amount of time they plan to stay in the host jurisdiction. The time permit may allow for "in and out" privileges.
5. Charge based on distance	<p>If electronic with location-based reporting, motorists' in-vehicle devices report distance traveled in each jurisdiction to their home jurisdiction or private account manager.</p> <ul style="list-style-type: none"> • Reporting: Visitors report distance traveled by jurisdiction to their home jurisdiction or to their private account manager automatically, for all jurisdictions with which the home jurisdiction or account manager has an agreement. • Payment: Visitors pay the home jurisdiction or private account manager for all miles traveled by jurisdiction, for those jurisdictions with which the home jurisdiction has an agreement, at the rate prescribed by each jurisdiction. <p>Visitors who report distance manually to their home jurisdiction must report distance of each trip in a host jurisdiction. This also applies to visitors with electronic reporting capabilities but whose home jurisdictions or private account managers do not have an agreement with the host jurisdiction, or for visitors to a host jurisdiction who otherwise do not accept electronic distance reporting.</p> <ul style="list-style-type: none"> • Reporting: Visitors must report the distance they traveled in the host jurisdiction directly to the host jurisdiction, or in the case where the host and home jurisdictions have an agreement for manual trip reporting, to the home jurisdiction. • Payment: Visitors must pay the host state the number of miles traveled times the rate per mile, either directly to the host jurisdiction or, in cases where the host and home jurisdictions have an agreement, to the home jurisdiction. In either case, the appropriate per-mile rate for each jurisdiction must be applied to the mileage. <p>Private account manager option: Some states may allow motorists to use a private account manager. A private account manager is a private company that acts as an agent for recording distance and, if opted by the motorist, location data, including billing and collection of RUC. If private account managers are allowed to provide the measurement and collection of RUC across state lines, they could apply the per-mile rate to mileage driven in each jurisdiction, collect RUC from the motorist, and remit revenues to all participating jurisdictions or to a clearinghouse operated on behalf of all participating jurisdictions.</p>

3.3 Bilateral jurisdiction reporting and reconciliation options

This section provides an outline of alternatives for reporting and reconciling RUC between two jurisdictions (bilateral jurisdictions) under the five policy bases and three combinations of policies described in section 3.1 above.

3.3.1 No Charge

This is the status quo policy alternative whereby jurisdictions undertake no bilateral reporting of miles travelled for individual motorists. Thus, there would be no reporting, collection or



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reconciliation. Under Oregon's Road Usage Charge program, to be implemented in July 2015 pursuant to 2013 Senate Bill 810-Enrolled, there is no charge for out of state vehicles. RUC applies only to Oregon-registered vehicles.

3.3.2 Shadow Charge

This policy alternative would not comprise collection of payment since visitors make no payment and incur no administrative burden. Thus, the options described below are related solely to reporting and reconciliation.

Shadow Charge Reporting Options

To report and exchange information on estimated cross-jurisdictional travel between two jurisdictions with or without a common border, both jurisdictions must agree on the methodology for estimating distance travelled by visitors on each jurisdiction's roadways. This includes the ability to estimate mileage by visitors in each individual jurisdiction.

There are two main options for jurisdictions to collect and report data about distances traveled on its roadways by visitors:

- Agree and use the same methodology for estimating distances traveled in each jurisdiction by visitors from all other jurisdictions, or
- Each jurisdiction reviews and agrees to the other jurisdiction's distinct methodology. This may seem a bit cumbersome but some jurisdictions have an established methodology for calculating miles traveled in legislation (for both in-state vehicles and visitors), which might prevent — from a legal perspective — the adoption of the "same" methodology for both jurisdictions.

The key to either option for collecting and reporting data is that both jurisdictions agree to report distance traveled based on standard and agreed metrics, whether or not the methodology is the same.

In addition to travel, the reporting period (e.g., monthly, quarterly, annually) will also need to be agreed bilaterally, and may vary from one bilateral jurisdiction to another.

Based on the methodology selected or the distinct methodologies bilaterally accepted, each jurisdiction collects data about distances traveled by resident motorists and visitors from the other jurisdictions. There are several potential sources of data for distance traveled, including the examples below:

- Floating car data (FCD) are anonymous data collected from a sample of equipped vehicles in a fleet for purposes of travel pattern analysis. FCD are available from some state transportation agencies and from private data providers. In the future, vehicles opting for electronic RUC reporting can serve as FCD data points. These data can be used to extrapolate estimates of distances travelled by visitors in each jurisdiction. This source of data is likely a longer-term solution or methodology since at the outset of implementing



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RUC, it is very likely that the number of equipped vehicles will be too small to provide a sufficient sample size for statistically valid extrapolation.

- FCD based on data purchased from vendors who track private vehicles and fleets for purposes of travel analysis. In some cases, these data sets may be useful for estimating visitor travel by jurisdiction.
- Roadside equipment comprising traffic counters and automated license plate reader (ALPR) cameras, especially those posted on roadways at jurisdictional boundaries. As noted in the Task 2.1 memo, the jurisdictions participating in this study have dozens to hundreds of cross-jurisdictional roadways. However, it is likely that the vast majority of cross-jurisdictional traffic is concentrated on key crossings such as Interstates and other major highways. This could lead to significant savings in the cost of roadside equipment because:
 - Adjacent jurisdictions could deploy equipment at selected crossings that will provide data for all participating jurisdictions, and
 - The number of boundary roadways necessitating roadside equipment could be focused on key crossings with the vast majority of traffic such as Interstate highways.
- Travel surveys administered at the roadside for purposes of trip sampling to estimate total mileage by visitors.

Although roadside equipment can detect visitors, they cannot provide accurate, reliable estimates of distance traveled by the visitors. Therefore, such technology would be useful primarily as one source of input data for estimating aggregate cross-border travel by vehicles subject to RUC and specifically subject to shadow charges.

Shadow Charge Reconciliation Options

Since motorists would not be required to measure or report travel, nor pay any charges under a shadow charge, the options for reconciliation between bilateral jurisdictions would be limited to the jurisdictional level. The computations would be the balance of travel between two jurisdictions based on the agreed methodology, any difference in the distance-based RUC rates, and conversion factors if necessary (e.g., km, foreign exchange rate).

3.3.3 Charge Based on Fuel Consumption

For this policy alternative, host jurisdictions would collect fuel tax, as is the current situation. Consequently, there would be no reporting and reconciliation required between bilateral jurisdictions unless desired to do so following the model of the International Fuel Tax Agreement (IFTA), which applies only to heavy interstate vehicles (>26,000 pounds gross vehicle weight rating, or GVWR). It should be noted that this option might not be viable due to complexities associated with agreeing among multiple jurisdictions where fuel was purchased. This option would also require the capture of reliable fuel purchase data from all motorists, which would be cost prohibitive.



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3.3.4 Charge Based on Time

Host jurisdictions would issue time permits (e.g., day, week, month, year) and collect payment directly from visitors. The reporting options described below concern strategies for bilateral jurisdictions (two adjacent jurisdictions) with a common border to implement and operate systems for unilateral or bilateral jurisdiction time permits.

Time-Based Reporting Options

For reporting and information exchange on time permits issued and revenue generated, both jurisdictions might want to exchange this information. Means of reporting and information exchange on time permits as well as other issues like signage can be summarized as follows:

- Time permits could be issued in either electronic or paper formats. Electronic format (e.g., enforced by digital read of license plates) may be preferable for the following reasons:
 - Time permits in paper format would require anti-counterfeit for the design and printing to deter potential copying, which would be a significant cost difference compared to electronic permits with each registered visitor having their license plate entered into a dedicated database at the state or regional level.
 - Secure transfer and storage of time permits in paper format — like handling cash — would be required to deter potential theft.
 - Electronic permits could be automatically verified by roadside equipment or mobile units, whereas paper permits would always require human intervention for first level verification. There is a significant cost advantage for electronic vs. paper permits.
 - Either choice for the time permit would require implementation of associated enforcement policies and procedures.
- Time permit website(s). The design, implementation and operation of RUC-related websites for time permits comprise three distinct scenarios which could also be transitional in nature with the long-term goal being a US- or region-wide dedicated website for time permits in all participating jurisdictions. The three scenarios are described as follows:
 - Each jurisdiction implements and operates its own dedicated RUC time permit website for visitors.
 - Two jurisdictions (bilateral jurisdictions) implement one website for motorists in each jurisdiction driving as visitors in the other jurisdiction. This would reduce costs for each jurisdiction and allow them to share in the cost of design (branding) and operations of a RUC time permit website.
 - All jurisdictions requiring RUC time permits for visitors could be “members” of a US- or region-wide dedicated RUC time permit website. This would allow all participating jurisdictions to share the design (branding), implementation and operations costs thereby reducing costs concomitantly for websites set up by individual or bilateral



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jurisdictions. Although each state could adapt its own registration website to accommodate RUC time permits, a single website covering all states would be less costly and simpler to use from a user perspective, particularly for travelers crossing multiple states.

- Time permit kiosks located at a limited number of border crossings could be designed, built and operated on behalf of both jurisdictions for visitors. Alternatively, jurisdictions could implement and operate time permit kiosks on each side of key border crossings. This approach would likely double the implementation and operations costs. If RUC time permit kiosks are co-located for a pair of jurisdictions, a key issue would be which side of the border to locate the kiosks. For example, if there are ten key/strategic border crossings between two adjacent jurisdictions, the location could be such that five kiosks are located near the border in each of the two jurisdictions, respectively. Placement should also be chosen to reflect demand from visitors entering the jurisdiction.
- Jurisdictions could decide to have their own dedicated time permit kiosks on both sides of the border at all key/strategic locations. This would increase implementation and operations costs for both jurisdictions. However, it would enable both jurisdictions to avoid having to deal with reconciliation of revenue at co-located kiosks.
- Roadway signage. Since motorists from one state crossing a border to another state will be required to obtain a time permit prior to driving on roadways as visitors, it is incumbent on jurisdictions to design and implement corresponding roadway signage at or very near border crossings. This RUC time permit signage could be designed as a WRUCC research project in order to harmonize RUC-related roadway signage in the case of time permits.
- Roadside equipment (cameras). In the case of electronic time permits, roadside equipment could be located near the borders (but not upstream of the kiosks) to verify via ALPR that visitors have obtained the time permit prior to entry.

Time-Based Reconciliation Options

Since each jurisdiction would collect the RUC time permit directly from visitors, there would be no reconciliation required between bilateral jurisdictions. The only exception would be in the case of co-located RUC time permit kiosks or a jointly-operated website with a single payment gateway, which would require information sharing on revenue collected for and on behalf of each jurisdiction. This reconciliation could occur when the operator of the kiosks³ and/or website reports revenues on a recurrent basis, with a split payment, one to each jurisdiction, for example monthly or quarterly.

AGES, a private company providing automated time permit services to heavy and light vehicles in Europe, serves as an example of an automated multi-jurisdictional time-based operational concept. The diagram below captures the key steps involved in booking a multi-jurisdictional time permit, known as an e-vignette, through AGES: booking by visitor, payment by visitor,

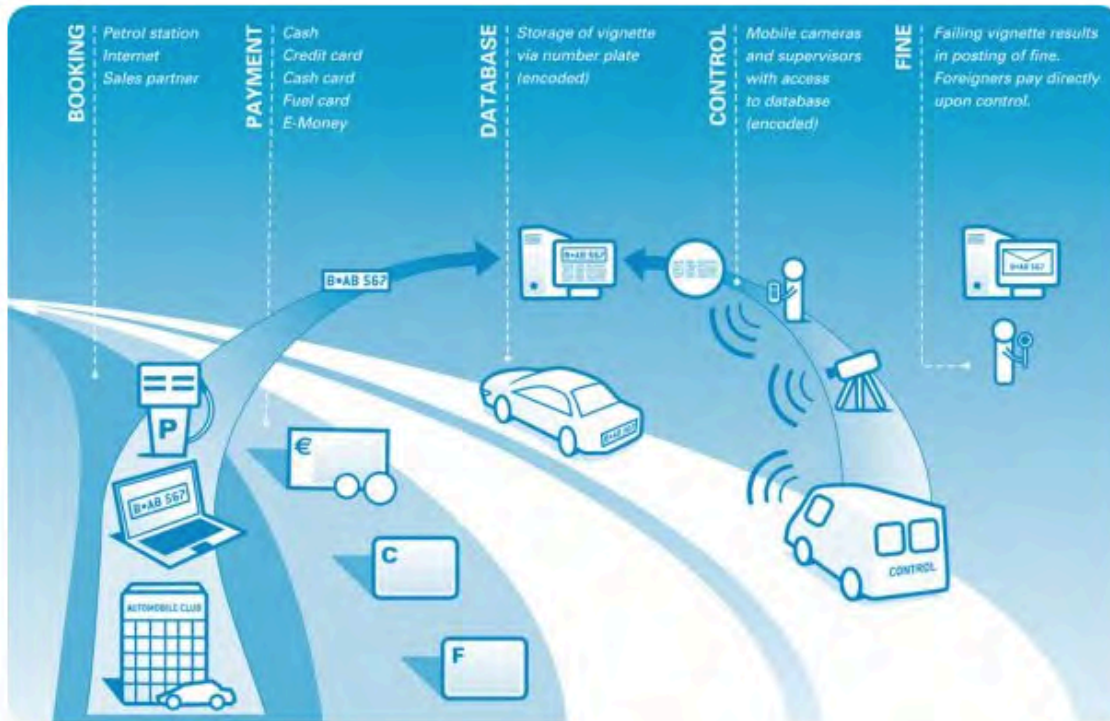
³ The kiosks and website could be operated directly by a state-run RUC agency or by a vendor contracted by the RUC agency.



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database entry by operator, control by law enforcement, and fine by law enforcement if found non-compliant. More information about AGES's e-vignette system is available at: <http://www.ages.de/en/e-vignette.html>.



3.3.5 Charge Based on Distance

For RUC based on distance traveled, options for reporting and reconciling comprise manual and automated methods as described below.

Distance-Based Reporting Options

- Manual (without location-based reporting). There would be no bilateral jurisdiction reporting in the case of manual declaration by visitors for RUC based on distance traveled because all visitors would be required to report miles directly to the jurisdictions in which they travel.
- Automated (with location-based reporting). Host jurisdictions would undertake no bilateral reporting for visitors. Visitors would travel on a host jurisdiction's roadways with the charge automatically computed and invoiced by their home jurisdiction, with subsequent reconciliation of the payment collected between the two jurisdictions for distance traveled on each other's roadways.



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Distance-Based Reconciliation Options

- Manual (without location-based reporting). There would be no bilateral jurisdiction reconciliation in the case of manual declaration by visitors for RUC based on distance traveled, because all visitors would be required to report and pay for miles directly to the host jurisdictions in which they are traveling as a visitor.
- Automated (with location-based reporting). Visitors would pay for all miles traveled (in or outside of their home jurisdictions) directly to their home jurisdiction's RUC agency or private account manager. The account manager would apply the appropriate jurisdictional per-mile rate to the miles traveled in each jurisdiction. Bilateral jurisdiction reconciliation would occur on a recurrent basis as agreed between the two jurisdictions (e.g., monthly, quarterly, annual) and would be based on actual miles traveled by motorists from each other's jurisdiction, and actual distance-based charge rates in each of the two jurisdictions. This arrangement would require the two jurisdictions to maintain an agreement on reporting periods as well as updated per-mile rates to be used by the respective jurisdictions and/or private account managers.

3.3.6 Distance-Based, with Shadow Charges

This combination of policy alternatives would entail bilateral jurisdictions using an agreed combination of reporting and reconciliation methods and corresponding metrics for calculating differentiated and undifferentiated miles traveled by visitors.

Distance-Based + Shadow Charges Reporting Options

For reporting options, the bilateral jurisdictions would apply a combination of undifferentiated and differentiated distance charges:

- Undifferentiated distance charges. RUC payments would be reported based on the methods outlined above for shadow charges and based on approximated aggregate distance traveled in each jurisdiction.
- Differentiated distance charges. RUC payments would be based on the method outlined above for automated reporting of distance-based charges.

Distance-Based + Shadow Charges Reconciliation Options

For both distance-based and shadow charges the reconciliation process would be the same, whereby bilateral jurisdictions would make recurrent reconciliation payments based on the balance of distance traveled and difference in rate of distance-based charge.

Note: For bilateral jurisdictions comprising regions from Canada and/or Mexico, there would be the additional reconciliation requirements related to agreeing to the conversion factor for kilometres to miles, and currency conversions for the conversion rate, source, and update interval.



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3.3.7 Distance-Based and Fuel-Based, with or without Shadow Charges

This combination of policy alternatives would comprise the same approach for reporting and reconciliation as distance-based with shadow charges with one key difference: the requirement to also estimate fuel consumption and, if done without shadow charges, to include fuel tax receipts in the reconciliation process between bilateral jurisdictions.

3.3.8 Distance-Based and Time-Based

This combination of policy alternatives would require use of reporting and reconciliation options that are a combination of those noted above separately for distance-based and time-based charges.

Distance- and Time-Based Reporting Options

Visitors with location-based reporting (differentiated distance) would report and make RUC payments to their home jurisdictions. All other visitors would be required to purchase time permits, and the bilateral jurisdiction reporting requirements would be the same as the alternative “charge based on time” described above.

Distance- and Time-Based Reconciliation Options

For distance-based charges for bilateral jurisdictions, the process for reconciliation would be the same as “distance-based charge” alternative described above. For visitors purchasing time permits, there would be no reconciliation required since each jurisdiction would collect the RUC time permit directly from visitors. In the case of a co-located kiosk or jointly operated time permit website, the reconciliation of time permit charges on a recurrent basis could be combined with the reconciliation of distance-based charges into a single transaction. Such a transaction would be facilitated if the entities conducting the reconciliation for time permits and distance-based charges were the same.



3.4 Multilateral jurisdiction reporting and reconciliation options

In an environment of multilateral jurisdictions, the notion of interoperability of reporting, reconciliation, and financial clearing comes into play. There are two general methods for such multilateral reporting, reconciliation, and financial clearing. The first is for more than two jurisdictions to report and reconcile distance charges in multiple pairwise (bilateral) agreements along the lines of the alternatives presented in the previous section. This is the “mesh” approach used in some interoperability tolling environments for light vehicles like E-ZPass in the Northeast United States and Liber-t in France. This approach requires $N!/(2*(N-2)!)$ links among agencies and $N-1$ links for each agency. This is illustrated in the image at left, which depicts 5 agencies comprising 10 links, 4 for each agency.



However, a more efficient alternative is a “star” approach whereby there is a single agreement among multiple jurisdictions and a single clearinghouse that handles multilateral reporting, reconciliation, and financial clearing. This approach reduces the number of links for each agency to 1 and the total number of links in the network to N . The star approach is illustrated at left, depicting 5 agencies, each with 1 link, for a total of 5 links.



This section summarizes such a multilateral approach for RUC comprising an outline of the key options for reporting and reconciling RUC between more than two jurisdictions (multilateral jurisdictions) under the five policy bases and three combinations of policies. The logic of these concepts applies equally for any number of jurisdictions greater than two.

3.4.1 No Charge

Like for the case of bilateral jurisdiction, this is the status quo policy alternative whereby jurisdictions undertake no reporting of miles travelled for individual motorists. Thus, there would be no reporting, collection or reconciliation.



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3.4.2 Shadow Charge

Like for the case of bilateral jurisdictions, this policy alternative would not comprise collection and payment from motorists since visitors make no payments and incur no administrative burden. Thus, the options described below relate solely to reporting and reconciliation.

Shadow Charge Reporting Options

To report and exchange information on estimated cross-jurisdictional travel between multiple jurisdictions (more than two jurisdictions, with or without a common border), the jurisdictions must agree on the methodology for estimating distance traveled by visitors on each jurisdiction's roadways. This includes the ability to estimate mileage for visitors at the aggregate and individual jurisdiction levels. The most practical and easiest approach would be to have one single methodology for all jurisdictions involved in a multi-jurisdictional environment. However, as described for bilateral jurisdictions, multiple methods could be utilized on a pairwise basis, with the following two main options for jurisdictions to collect and report data about distances traveled on its roadways by visitors:

- Agree and use of the same methodology for estimating cross-jurisdictional aggregated distance traveled, or
- Each jurisdiction reviews and agrees to the other jurisdictions' distinct methodologies.

Further details of the pairwise options (bilateral jurisdictions) for reporting options can be found in section 2.2.

The key to this alternative is that, even if there are unique agreements about mileage estimation methodology between pairs of jurisdictions, the overall multilateral jurisdictional agreement can remain in place, subject to the specific guidelines for estimating mileage between particular pairs of jurisdictions party to the agreement. For example, two jurisdictions connected by a tolling facility might agree to use data from the toll system as the basis for estimating cross-border travel, while adhering to a mileage estimation methodology based on FCD for other neighbors without toll facilities at the borders.

Shadow Charge Reconciliation Options

Since motorists would not be implicated in charges and subsequent multilateral jurisdiction reconciliation for a shadow charge, the options for reconciliation between multilateral jurisdictions would be limited to the jurisdiction level. Data on distance traveled by visitors would be collected by each jurisdiction and reported as noted above with two key reconciliation options:

- Distance traveled reporting and data are exchanged on a pairwise basis with financial clearing.



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- Distance traveled reporting and data are exchanged with a clearinghouse that aggregates the distance traveled by visitors in each jurisdiction and calculates corresponding RUC rates to determine the total amounts owed from each jurisdiction to all other jurisdictions.
 - Like for the bilateral option, the computations would likely be the balance of travel between all pairs of jurisdictions based on the agreed methodologies, as well as any difference in the per-mile RUC rate and conversion factors, if necessary (e.g., km and foreign exchange rate).
 - A single transaction is made between the clearinghouse and each of the participating jurisdictions. This “transaction” could be in the form of information for financial clearing of the net revenue due or formal exchange of revenue in the event that the interoperability option entails financial clearing. In the former case, each jurisdiction that is not party to the financial clearing aspect of the multilateral arrangement could execute financial transactions with all other jurisdictions based on the reconciliation indicated by the clearinghouse.

3.4.3 Charge Based on Fuel Consumption

For this policy alternative, the host jurisdictions would collect fuel tax, as is the current situation. Consequently, there would be no reporting and reconciliation required between jurisdictions.

3.4.4 Charge Based on Time

For this policy for charge based on time and depending on the interoperability framework implemented, there are two key alternatives for a time permit program:

- Each jurisdiction runs its own time permit program (day, week, month, year) and collects payment directly from visitors, or
- There is a single clearinghouse operator of a time permit program for all participating RUC jurisdictions. The clearinghouse operator would provide time permits for multiple jurisdictions so that motorists visiting jurisdictions could make a single transaction for trips involving multiple jurisdictions. This works best via electronic permits, which can be issued virtually rather than paper permits which must be issued in person by each jurisdiction.

For RUC based on time, options for reporting and reconciling comprise jurisdiction-run time permit programs or a single clearinghouse operator program as described below.

Time-Based Reporting Options

- Jurisdiction-run time permit program. The same reporting options as for bilateral jurisdictions would prevail for this multi-jurisdictional environment when each jurisdiction implements its own permitting program, or implements a bilateral program.
- Single clearinghouse operator time permit program (“star” approach described at the start of this section). Host jurisdictions would undertake no reporting for visitors; however, host jurisdictions may want to use existing and new traffic counts to evaluate the program’s



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efficacy. The clearinghouse operator would set up and maintain a time permit website for all participating jurisdictions for motorists to pre-pay on-line for travel. Visitors would pre-pay (on-line, telephone, mail, etc.) for travel on host jurisdictions' roadways with the charge applied and collected by the clearinghouse operator. The clearinghouse operator would provide recurrent reporting of permits issued and revenue generated to all participating jurisdictions.

Time-Based Reconciliation Options

- Jurisdiction-run time permit program. Since each jurisdiction would collect the RUC time permit directly from visitors, there would be no reconciliation required, except for co-located RUC time permit kiosks and/or jointly-run bilateral time permit websites as explained in section 2.2.
- Single clearinghouse operator time permit program ("star" approach). Depending on the established framework for interoperability, the clearinghouse operator provides each participating jurisdiction their aggregated transaction information for financial clearing of the net revenue (that could then be done on a bilateral basis between all pairs of jurisdictions), or conducts a single transaction with each participating jurisdiction to reconcile funds owed or funds due based on the time permits issued and corresponding revenue in each jurisdiction during the reporting period.

3.4.5 Charge Based on Distance

For RUC based on distance traveled, options for reporting and reconciling comprise manual and automated methods as described below.

Distance-Based Reporting Options

- Manual (without location-based reporting). There would be no multilateral jurisdiction reporting option in the case of manual declaration by visitors for RUC based on distance traveled because all visitors would be required to report miles directly to the jurisdictions in which they are traveling.
- Automated (with location-based reporting). Jurisdictions would undertake no multilateral reporting for visitors. Visitors would travel on roadways outside their jurisdiction with the charge automatically computed and reported by their home jurisdiction and/or private RUC account manager. In the case of a single clearinghouse, the operator calculates all relevant distance charges and provides each participating jurisdiction their aggregated transaction information from RUC account managers for financial clearing of the net revenue due.

Distance-Based Reconciliation Options

- Manual (without location-based reporting). Like for reporting, there would be no reconciliation in this case.
- Automated (with location-based reporting). In the case of a single clearinghouse, the clearinghouse operator provides reconciliation based on aggregated and recurrent



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transaction information for all jurisdictions by conducting a single transaction with each participating jurisdiction to reconcile funds owed or funds due based on the distance travelled and RUC rates in each jurisdiction. It should be noted that the financial clearing could also be done on a bilateral basis between some or all pairs of jurisdictions.

- Private RUC account managers. It is also possible that the private RUC account managers, should they operate in one or more jurisdictions, could act themselves as the clearinghouse, distributing funds to each jurisdiction based on the charges incurred by their customers in each jurisdiction. This would require each jurisdiction to have an agreement with each private RUC account manager, or for the private RUC account manager to have a single agreement with a multi-jurisdictional entity for RUC administration (similar to how IFTA operates for fuel tax administration) serving as an umbrella agreement with all participating jurisdictions.

3.4.6 Distance-Based, with Shadow Charges

This combination of policy alternatives would entail multilateral jurisdictions using an agreed combination of reporting and reconciliation methods and corresponding metrics for calculating differentiated and undifferentiated miles traveled by visitors from each participating jurisdiction.

Distance-Based + Shadow Charge Reporting Options

For reporting options, the multilateral jurisdictions would apply a combination of undifferentiated and differentiated distance charges:

- Undifferentiated distance charges. RUC payments would be reported based on the methods outlined above for shadow charges and based on approximated aggregate distance traveled in each jurisdiction.
- Differentiated distance charges. RUC payments would be based on the method outlined above for automated reporting of distance-based charges.

Distance-Based + Shadow Charge Reconciliation Options

For both distance-based and shadow charges there could be a single clearinghouse operator that does distance-based clearing across all participating jurisdictions whose motorists have location-based reporting. For all other motorists (undifferentiated distance charges), the clearinghouse also does a shadow charge as described above. The result of the two calculations can be combined into a single recurrent transaction for each jurisdiction with the clearinghouse.

Note: For multi-jurisdiction arrangements comprising regions from Canada and/or Mexico, there would be the additional reconciliation requirements related to agreeing to the conversion factor for kilometres to miles, and currency conversions for the conversion rate, source, and update interval.



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3.4.7 Distance-Based and Fuel-Based, with or without Shadow Charges

This combination of policy alternatives would comprise the same approach for reporting and reconciliation as distance-based with shadow charges with one key addition: reconciliation calculation that is based on fuel consumption. It should be noted that this option may not be viable due to complexities associated with agreeing among multiple jurisdictions where fuel was purchased. If not done as a shadow charge, this option would also require the capture of reliable fuel purchase data from all motorists, which would be very costly to capture, if not impossible.

3.4.8 Distance-Based and Time-Based

This combination of policy alternatives would require use of reporting and reconciliation options that are a combination of those noted above separately for distance-based and time-based charges in a multi-jurisdictional environment.

Distance- and Time-Based Reporting Options

Visitors with location-based reporting (differentiated distance) would report and make RUC payments to their home jurisdictions. For visitors purchasing time permits, the multilateral jurisdiction reporting requirements would be the same as the alternative “charge based on time” described above.

Distance- and Time-Based Reconciliation Options

For distance-based charges for multilateral jurisdictions the process for reconciliation would be the same as “distance-based charge” alternative described above through the clearinghouse. For visitors purchasing time permits, there would be no reconciliation required since each jurisdiction would collect the RUC time permit directly from visitors. However, as described above, a multi-jurisdiction time permit system/function could be implemented under the time-based charge policy alternative.

3.5 Enforcement

Enforcement of compliance is an important component of multi-state RUC. There are at least two dimensions of enforcement. The first is to minimize opportunities for visitors avoid, game, or otherwise defraud home and host jurisdictions of their tax obligations. A second dimension is for states to monitor and enforce one another’s activities, as well as activities of vendors and private account managers involved in multi-state road usage charge collection and reconciliation. This memo addresses only the first dimension in detail.



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This section provides an overview of key enforcement aspects related to individual motorists for each of the five policy alternatives as outlined below.

- No charge. This is the status quo policy alternative whereby visitors undertake no reporting of miles travelled to host jurisdictions. Thus, there would be no enforcement required.
- Shadow charge. This policy alternative would comprise no enforcement aspects, except for any enforcement associated with floating car data from visitors who selected location-based distance reporting in their home jurisdictions. However, no enforcement actions are required in host jurisdictions.
- Charge based on fuel consumption. This policy alternative, like the no charge alternative, would have no enforcement required since fuel consumption would not be reported and payment of charges is included in the price of fuel.
- Charge based on time. This policy would comprise several relevant and inter-related enforcement activities for visitors:
 - Roadside enforcement of visitors. Such enforcement activities would be carried out at border crossings, in particular, and any existing checkpoints such as agriculture stations in California. This enforcement activity would be best accomplished under an electronic time permit system with verification done via entry of license plate into a database that is then checked by an enforcement system (ALPR via fixed or mobile systems). Some considerations for a time permit system with paper stickers include:
 - Permit sticker location in the windshield.
 - Permit stickers for frequent multi-jurisdiction motorists could lead to windshields being encumbered with stickers.
 - Permit stickers would require fraud detection (mostly for counterfeit stickers) equipment and procedures, which could be very costly to implement and operate in comparison to electronic stickers.
 - ALPR equipment could be deployed strategically at or near border crossings (downstream of kiosks, if they exist) to identify license plates of visitors and run a check against paid permits, and send invoices/penalties to unpaid visitors.
 - Roadside and mobile enforcement could be deployed. Such enforcement activities would be most effective if the time-based charge comprised only electronic stickers, because it would allow the system to electronically determine compliance of visitors. For a manual system, it is likely that visitors could not be pulled over unless for another traffic violation or a “time permit spot check,” which would be expensive and would impede the flow of traffic.



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- Charge based on distance. This policy alternative would comprise several potential overlapping and complementary options:
 - Visitors with approved location-based RUC reporting devices issues from their home state could be entered into a bilateral or multilateral system comprising a database of “compliant” visitors.
 - Visitors could be required to pay manual distance-based RUC to host jurisdictions. This approach would be hard to enforce because of the difficulties associates with identifying compliance vs. non-compliance. Furthermore, the legal basis for this type of enforcement could be difficult to define and implement. Enforcement strategies also depend on whether the manual distance-based RUC would be pre- or post-pay.
 - For both options noted above, ALPR could be used to identify visitors and facilitate enforcement of compliance on a more targeted group of motorists.

In summary, there are four key types of enforcement options that could be deployed:

- ALPR along the roadways,
- Mobile units with ALPR,
- Visual and/or automated enforcement at border crossings, and
- Roadside enforcement throughout the host jurisdiction.

Some combination of more than one type of enforcement should be considered. Overall, for all four options, ALPR would be the most effective automated solution to deploy because it would be more complete without impeding traffic. This approach would enable states to feel secure that, even though not all crossings are covered, most vehicles are being checked using automation.



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4 Conclusions and Next Steps

The table below summarizes the five policy bases and three combinations of policies for charging for road usage by visitors.

Table 4-1 Summary of reporting, payment, and reconciliation approaches for policy alternatives

Activity Policy Alternative	Individual reporting and payment	Bilateral jurisdiction reporting & reconciliation	Multilateral jurisdiction reporting & reconciliation
1. No charge	No reporting. No payment.	No reporting. No reconciliation.	No reporting. No reconciliation.
2. Shadow charge	No reporting. No payment outside of home jurisdiction.	Estimate distance traveled by visitors on each jurisdiction’s roadways. Reconciliation limited to the jurisdictional level.	Estimate distance traveled by visitors on each jurisdiction’s roadways. Reconciliation limited to the jurisdictional level pairwise or via a multi-jurisdictional clearinghouse.
3. Charge based on fuel consumption	No reporting. Payment of charges is done indirectly.	No reporting. No reconciliation.	No reporting. No reconciliation.
4. Charge based on time	Report presence in host jurisdiction and length of time. Payment via time permit.	Various means of reporting on time permits. No reconciliation between jurisdictions since RUC time permit collected from visitors directly, except in cases of a jointly-operated kiosk and/or time permit website with e-payment gateway.	Reporting. (1) Jurisdiction-run time permit (same reporting options as for bilateral jurisdictions) (2) Single clearinghouse operator of a time permit (host jurisdictions undertake no reporting). Reconciliation. (1) Jurisdiction-run time permit (No reconciliation except for co-located kiosks and/or jointly-run time permit websites) (2) Single clearinghouse operator of a time permit (jurisdictions receive aggregated transaction information for financial clearing of net revenue).
5. Charge based on distance	Report distance traveled in host jurisdiction. If automated and location-based, reporting happens automatically. If manual and/or non-location based, visitors must file trip reports indicating mileage of each visit to each jurisdiction. Payment for miles traveled to host or home jurisdiction.	Reporting. (1) Manual – no reporting since RUC collected from visitors directly. (2) Automated – RUC automatically computed and invoiced by home jurisdiction or private account manager. Reconciliation. (1) Manual – no reconciliation since RUC collected directly by host jurisdiction. (2) Automated – recurrent reconciliation as visitor pays RUC to home jurisdiction or private account manager.	Reporting. (1) Manual – no multilateral reporting since RUC collected from visitors. (2) Automated – RUC automatically computed and invoiced by home jurisdiction. Reconciliation. (1) Manual – no reconciliation since RUC collected by host jurisdiction. (2) Automated – jurisdictions receive aggregated transaction information from clearinghouse for financial clearing of the net revenue.



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Activity Policy Alternative	Individual reporting and payment	Bilateral jurisdiction reporting & reconciliation	Multilateral jurisdiction reporting & reconciliation
6. Distance-based with shadow charges	N/A	Reporting. (1) Undifferentiated distance charges – Same as for shadow charges and based on approximated aggregate distance traveled in each jurisdiction. (2) Differentiated distance charges – Same as for automated reporting of distance-based charges. Reconciliation is same for distance-based and shadow charges – bilateral jurisdictions make recurrent reconciliation payments based on the balance of distance traveled and difference in rate of distance-based charge.	Reporting. (1) Undifferentiated distance charges – Same as for shadow charges and based on approximated aggregate distance traveled in each jurisdiction. (2) Differentiated distance charges – Same as for automated reporting of distance-based charges. Reconciliation. For both distance-based and shadow charges – single clearinghouse operator that does distance-based clearing across all participating jurisdictions.
7. Distance-based & fuel-based, with or without shadow charges	N/A	Same approach for reporting and reconciliation as distance-based with shadow charges. Difference is requirement to estimate fuel consumption and include fuel tax receipts in the reconciliation process.	Same approach for reporting and reconciliation as distance-based with shadow charges. Difference is requirement for reconciliation calculation based on fuel consumption.
8. Distance-based and time-based	N/A	Reporting. (1) Differentiated distance charges – RUC payments to home jurisdiction. (2) Others purchase time permits with reporting same as charge based on time. Reconciliation. (1) Differentiated distance charges – same as distance-based charge. (2) No reconciliation for time permits.	Reporting. (1) Differentiated distance charges – RUC payments to home jurisdiction. (2) Others purchase time permits with reporting same as charge based on time. Reconciliation. (1) Differentiated distance charges – same as distance-based charge. (2) No reconciliation for time permits.

Immediate next steps include cost and revenue analysis of the multi-jurisdictional RUC alternatives, consideration of international RUC alternatives, and analysis of existing programs. Remaining questions to answer include the following:

- How much cross-border travel exists in the various jurisdictions?
- What are the revenue implications of multi-jurisdictional RUC, i.e., how much revenue do individual jurisdictions stand to gain or lose if they do not have agreements with their neighboring jurisdictions?
- Along the same lines, what are the costs associated with setting up and operating any of the above alternatives for multi-jurisdictional RUC reporting and reconciliation? How effective and costly will the enforcement be in a multi-jurisdictional environment?
- How can the basic premise of multi-jurisdictional RUC be operationalized in the U.S. between states as well as internationally between U.S. border states, Mexico, and Canada?



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- What programs exist today in the jurisdictions that could be used as the basis for a future multi-jurisdictional RUC program? We have conducted a preliminary analysis of several programs that could serve as models. A summary of findings is included in the Appendix.

We have outlined a range of policy alternatives and operational concepts from the perspectives of individual motorists as well as jurisdictions. Notionally, the list below summarizes some implementation steps that could be pursued in further developing any of these alternatives into an operational solution for a multi-state RUC environment:

- Develop and prepare templates of inter-governmental agreements necessary to implement multi-state RUC with possible cost and revenue sharing options.
- Agree to an organizational home of any clearinghouses or multi-jurisdictional vendors necessary for the implementation and operations of any of these alternatives, e.g., regional entities such as IFTA.
- Inter-governmental decision on approach to interoperability and clearinghouse functions:
 - Mesh approach (described in 3.4) with pairwise agreements and clearing.
 - Star approach (described in 3.4) with clearinghouse for
 - Reporting
 - Reconciliation
 - Financial clearing (option to have bilateral recurrent clearing)
- Technical agreements on how data and information will be collected and exchanged.
- Establish and agree upon business rules.
- Set up and functional elements requirements
 - Data collection and computation in terms of funds exchange; and,
 - Calculate who owes what based on business rules
- Financial clearing: pairwise or via the clearinghouse.

We find that multi-jurisdictional RUC is feasible, and many alternatives exist for its implementation, operations, and enforcement across a range of policy bases and combinations of policies. However, not all of the alternatives may be desirable, and jurisdictions may prefer varying approaches. Given the likelihood of diverse policies toward motorists across jurisdictional borders (e.g., fuel tax in one, RUC in the next, shadow charges between some pairs, time permits), a multi-jurisdictional scheme must be flexible to accommodate a range of policies for coordinated operations and enforcement that evolve over time. For example, the easiest approach for an early adopter of RUC may be to keep fuel tax in place for visitors while allowing visitors to opt in to a time- or distance-based approach. The need for flexibility is particularly critical for the first several jurisdictions that attempt to implement RUC, whether alone or in collaboration through mechanisms like those described in this document.



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ASSESSING OUT-OF-STATE DRIVERS IN A RUC SYSTEM: PHASE 2 FINAL REPORT

Western Road Usage Charge Consortium // December 2016

 **WA RUC**



Assessing Out-of-State Drivers in a Road Usage Charge System: Phase 2
Final Report



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RUC
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**Assessing Out-of-State Drivers in a
Road Usage Charge System: Phase 2**

Final Report

Prepared by D'Artagnan Consulting
December 19, 2016



Assessing Out-of-State Drivers in a Road Usage Charge System: Phase 2 Final Report

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Definitions & Abbreviations

TERM/ABBREVIATION	DEFINITION/DESCRIPTION	REMARKS
AADT	Average Annual Daily Traffic	
Clearinghouse	an entity that calculates reconciliation and, optionally, handles reconciliation payments among two or more jurisdictions.	
GPS	Global Positioning System	
HPMS	Highway Performance Monitoring System	
Home Jurisdiction	the jurisdiction in which a vehicle is registered. Jurisdictions can adopt bilateral or multilateral approaches for data reporting, road charge collection, and revenue reconciliation.	
Host Jurisdiction	jurisdiction in which a visitor travels. Jurisdictions can adopt bilateral or multilateral approaches for data reporting, charge collection, and revenue reconciliation.	
MPG or MPGe	Miles per gallon or miles per gallon equivalent	MPGe is used in lieu of MPG for vehicles that derive some or all motive power from a fuel source other than gasoline or diesel, such as electricity.
MRD	Mileage reporting device	
Reconcile	<ul style="list-style-type: none"> ▶ process of balancing two accounts, including calculation and payment of charges or refunds. In the Phase 1 final report we discussed two types of reconciliation: <ul style="list-style-type: none"> > <i>Individuals</i> reconcile the amount of charges paid with the amount of charges owed to all jurisdictions (home and hosts). Home jurisdictions or private account managers handle payments and refunds. > <i>Jurisdictions</i> reconcile the amount of charges collected from motorists with the amount owed by motorists. Additional payments or refunds are handled directly with other jurisdictions or through a clearinghouse. <p>In this report we concentrate on methods of reconciliation by jurisdictions.</p>	



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RUC	Road usage charge or road usage charging
Shadow Charge	a charge on one entity that is paid by another entity.
Visitor	registered owner or lessee of vehicle(s) traveling outside their home jurisdiction.
VMT	Vehicle Miles of Travel



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Executive Summary

This report summarizes the work performed under Phase 2 of the study of *Out-of-state Drivers in a Road Usage Charge (RUC) system*. It identifies and discusses key characteristics of interjurisdictional RUC, estimates the costs and revenue potential associated with assessing RUC on visitors, discusses interjurisdictional RUC assessment in an international context, and proposes a sequence of activities that WRUCC states can undertake to plan, develop and execute an interjurisdictional demonstration or pilot (hereafter referred to as pilot). The report focuses on states within the western region of the U.S. although the analysis and principles can be equally applied to other states outside the western region, the federal government, and jurisdictions bordering the U.S.

A principal topic of interest in a multi-state RUC context is methods of collecting and reconciling revenues among states when RUC is assessed on out-of-state visitors. Although states remain free to adopt various RUC operational concepts such as time permits (in which visitors pay RUC directly to host states), in a mature RUC system automated mileage reporting methods with location-aware devices are likely to be widespread. In this future, it is probable that a motorist will remit all charges to either their account manager or an agency in their home state, regardless of where miles were driven, and it will be necessary for jurisdictions to reconcile RUC collected among themselves. However, the low probability of a GPS mandate for any RUC system in the U.S. means that clear identification of where RUC is due is complex.

After estimating the proportion of RUC a state could expect to be generated by visitors (relative to residents), this report examines interjurisdictional RUC assessment and reconciliation costs under three policy bases developed for Phase 1 of the study: distance-based charge, shadow-charge, and combination of distance-based and fuel-based charges. It finds that distance-based charges are efficient only if everyone adopts a location-aware RUC reporting method and agrees to share location data (aggregated to the jurisdiction level) with their home state's RUC agency. In the near-term, a combination of distance-based and fuel-based user-fee assessment conveniently captures visitors, if they purchase fuel while in-state. Over the longer-term, as vehicles shift away from fossil fuels as a power source, less and less visitor road use will be "captured" via motor fuel tax payment. At that point, shadow charges are likely to be the most efficient method of capturing visitor travel to RUC states. Significant work remains to be done in terms of establishing agreed methodologies for determining shadow charges, particularly with states that do not assess any RUC at all.

Next, the report identifies characteristics of a successful interjurisdictional pilot, which include identification of clear policy questions in common across participating states, development of pilot objectives that address policy questions, clear definition of pilot scope, and definitions of organizational structure and business rules for implementing a pilot.

WRUCC may wish to adopt one of three different configurations for a regional or interjurisdictional pilot. Each of the three configurations offers opportunities to test unique RUC



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elements, such as using block chain accounting for revenue reconciliation, testing the ability of commercial account managers to serve the reconciliation function, and testing the deployment of open, common standards in an operational environment.

Finally, steps that WRUCC might follow to plan and develop an interjurisdictional pilot test include ascertaining level of interest among states to participate in a pilot, formalize an organizational structure for pilot planning and development, establish pilot goals and objectives, define the scope, identify key issues and risks, estimate costs, identify funding sources, and create a detailed action plan to deliver the pilot.



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Chapter 1: Introduction

In 2014, the Western Road Usage Charge Consortium (WRUCC) carried out Phase 1 of a study addressing charging out-of-state drivers in a RUC system on behalf of member state departments of transportation, including the Washington State Department of Transportation (WSDOT) as the lead participant and the state DOTs of Arizona, California, Colorado, Idaho, Montana, Oregon, Nevada, and Texas as joint funding partners. In 2016, WRUCC, now RUC-West, launched Phase 2 to accomplish the following:

- ▶ Estimate costs and revenues of interjurisdictional RUC (Chapter 2)
- ▶ Examine RUC opportunities across international borders (Chapter 3)
- ▶ Develop elements of a regional, interjurisdictional RUC demonstration (Chapter 4)

This report presents the research conducted under Phase 2. It estimates the costs and revenues of interjurisdictional RUC, including costs associated with financial reconciliation, examines legal and regulatory issues related to RUC opportunities across international borders, and identifies and discusses key elements of interjurisdictional RUC, proposing a sequence of activities that RUC-West states can undertake to implement an interjurisdictional demonstration or pilot (hereafter referred to as pilot). This report focuses on RUC-West states. although the analysis and principles can be equally applied to other states outside the western region, the federal government, and jurisdictions bordering the U.S.

1.1. Context

Under the current fuel tax system, passenger vehicles using liquid, carbon based fuel for travel on public roads pay the federal motor fuel tax, regardless of where the driver lives or where in the U.S. the fuel is purchased. Further, all states levy some amount of state fuel tax, and in many states other jurisdictions such as counties or cities levy additional local fuel taxes. In all cases, state fuel taxes are remitted to the state in which the fuel is purchased, not necessarily where it is consumed – fuel purchased on the California side of Lake Tahoe may be used to drive in Nevada, but the tax remains in California. Despite this, and perhaps because fuel taxes are both invisible and long-standing, it has been generally deemed acceptable that revenue remains in the jurisdiction where the fuel was purchased. However, a commonly voiced concern, both by motorists and officials, is that visitors to a state with a RUC might not be charged for using the host-state's roadways. Some members of the public have expressed questions about the fairness, or lack thereof, of only state residents contributing to road maintenance funding, even when out-of-state visitors are using the roads, while others perceive (correctly or not) that a very large share of the cars on the road are from out of state, and not including them in a road charging system amounts to the state voluntarily foregoing an important revenue stream.

Heavy vehicles (over 26,000 pounds), by contrast, consume relatively greater amounts of fuel and travel more frequently across jurisdiction borders. These vehicles are required reconcile fuel taxes paid to the mileage driven by jurisdiction through the International Fuel Tax



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Agreement (IFTA). IFTA serves as a model of a multi-jurisdictional framework for mileage (and fuel) reporting and reconciliation payments by drivers to 58 individual jurisdictions (48 lower U.S. states plus 10 Canadian provinces), as well as revenue reporting and reconciliation among the jurisdictions.

Transitioning from an invisible gas tax to RUC awakens a consciousness among officials and constituents alike that motorists are paying their state agencies for the miles they drive. It is not clear whether visitors, on the other hand, would be subject to charges for using the host-state's roadways absent a gas tax. Some members of the public have expressed questions about the fairness, or lack thereof, of only state residents contributing to road maintenance funding, even when out-of-state visitors are using the roads, while others perceive (correctly or not) that a very large share of the cars on the road are from out of state, and not including them in a road charging system amounts to the state voluntarily foregoing an important revenue stream.

In 2014, WRUCC sponsored Phase 1 of this study, which examined multi-jurisdictional policy and operational alternatives. That study developed and analyzed approaches that jurisdictions can consider for charging motorists from other jurisdictions for road usage, both along and in cooperation with other jurisdictions. The study examined a wide range of policy alternatives and suggested corresponding operational concepts for charging visitors, and established a basis for multi-state collaboration in reporting visitor data, collecting charges, and reconciling revenues.

RUC-West undertook this Phase 2 study to further extend the conceptual work completed in Phase 1 by defining cost and revenue estimates associated with various approaches to interjurisdictional RUC assessment, exploring specific issues that arise at international crossings, and exploring operational concepts for a multistate demonstration.

1.2. Review of Relevant Discussion from Phase 1

Several different policy bases for assessing RUC on a visitor were developed in Phase 1, including the option of not levying any tax or fee on visitors. These are listed in Appendix A. Some options, such as continuing to collect motor fuel taxes at the pump, require no reconciliation between jurisdictions – the tax remains in the state where the fuel was purchased. Many of the policy bases, however, require some sort of revenue reconciliation between states or countries.

1.2.1. Policy bases included in the analysis

Of the various policy bases explored in Phase 1 of this research, the following three were selected for closer examination during Phase 2:

- ▶ **Distance-based Charge.** Under a distance-based charge, motorists are assessed a charge based on the number of miles driven in a given jurisdiction. This requires direct measurement of miles driven in each jurisdiction and reporting of those mileage to either a state-managed RUC agency or a RUC account manager.



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Methods of measurement are wide-ranging and include (but are not necessarily limited to):

- > Automated methods such as a location-enabled OBDII dongle or smartphone app,
- > Manual methods such as:
 - Requiring motorists to report their vehicle information and odometer reading upon entering and leaving a jurisdiction, with subsequent invoicing and RUC collection
 - Manual inspection of odometers at border crossing stations, with subsequent invoicing and RUC collection
 - Sale of mileage permits

Under a distance-based charge, jurisdictions could assess RUC directly on visitors; that is to say an Oregon resident traveling in Washington would receive an invoice from and make payment to Washington. Alternatively, all mileage driven by a motorist could be invoiced by the home jurisdiction, and the various states could reconcile RUC amongst themselves.

The costs of these options varies widely, as does the reporting burden placed on the individual motorist.

- ▶ **Shadow Charge**. Under a shadow charge, states would not directly levy road usage charges on visitors. Rather, states would reconcile funds based on some estimate of the amount of visitor-generated vehicle miles traveled. The shadow charge can reduce costs associated with assessing and enforcing the RUC itself because each jurisdiction is concerned only with managing a RUC program for its own residents. However, the data required to adequately estimate not just VMT but also state of origin of visiting vehicles can be quite costly to collect. Over time and if an adequate number of jurisdictions implement location-aware mileage meters, data collected from RUC programs may be sufficient to calculate shadow charges.
- ▶ **Distance-based and fuel-based, with or without shadow charges**. Under this policy scenario, jurisdictions retain their motor fuel tax and, assuming a revenue-neutral RUC environment, refund fuel taxes paid to motorists.

Descriptions of the policy bases developed in Phase 1 but not included in Phase 2 can be found in Appendix A.

1.2.2. Reconciliation methods

As jurisdictions adopt RUC and make the decision to impose it on non-residents driving in the jurisdiction, it becomes necessary for them to enter into agreements for reconciling distance charges with other jurisdictions.



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Bilateral/Multilateral Road Usage Charging

There are two general methods for such multilateral reporting, reconciliation, and financial clearing. The first is for more than two jurisdictions to report and reconcile distance charges in multiple bilateral agreements. This is the “mesh” approach used in some interoperability tolling environments for light vehicles like E-ZPass in the Northeast United States and Liber-t in France. This approach requires many links among agencies. This is illustrated in Figure 1, which depicts five agencies comprising ten links, four for each agency.



Figure 1. Bilateral reconciliation model

As the number of states entering into road charge agreements grows, it becomes more efficient to adopt a “star” approach whereby there is a single agreement among multiple jurisdictions and a single clearinghouse that handles multilateral reporting, reconciliation, and financial clearing. This approach reduces the number of links for each agency to one and the total number of links in the network to N. The star approach is illustrated in Figure 2, depicting five agencies, each with one link, for a total of five links. This is similar to the arrangement IFTA uses.



Figure 2. Clearinghouse reconciliation model

The states participating in the study opted to further develop the multilateral (clearinghouse) reconciliation model. Other revenue reconciliation methods are briefly described below.

Distributed account reconciliation

A third, emerging alternative not discussed in Phase 1 is for states participating in an interjurisdictional RUC is to employ block chain accounting, in which each state is a node in a reconciliation system. A block chain database uses advanced cryptography and a distributed messaging protocol to create shared ledgers. Put simply, a blockchain is a record of events that is virtually impossible to change. Every node has a copy of the complete block chain, thereby eliminating the need for bilateral agreements or a centralized third party to manage reconciliation activities. For an interjurisdictional RUC application, blockchains provide three things that could revolutionize a multi-state, regional or national system:

- ▶ A shared, replicated, and transparent ledger for all RUC transactions
- ▶ A secure, unified register of customers, VIN numbers, and RUC technology employed on the vehicle



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- ▶ A method for any customer to transact directly with any state agency

A RUC block chain system would be scalable to any number of customers and states. This accounting model eliminates the need for bilateral/multilateral agreements or clearinghouse architectures. A RUC interjurisdictional pilot built on block chain technology and distributed applications opens the door to all of these ideas.

This puts the driver or RUC customer back in the center of the picture. By using a shared block chain architecture, every volunteer in a RUC interjurisdictional pilot has direct access to the data they need. The need for state-to-state data transfers and agency-to-agency financial exchanges for interoperable transactions are eliminated. Every driver can transact directly with either the home or host agency if location services automatic reporting of odometer readings are employed.

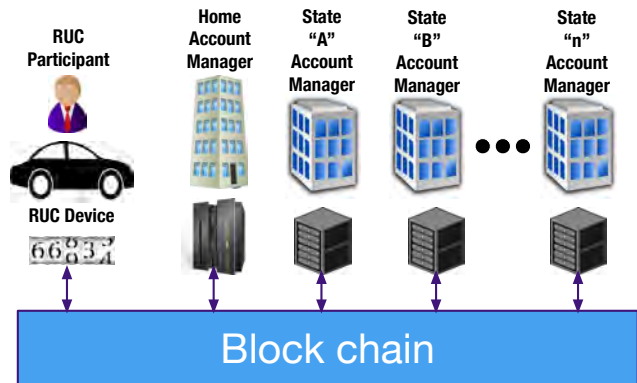


Figure 3. Block chain Model

While this technology was invented by and for Bitcoin, banks and other capital markets in the U.S., Europe, and Australia have begun to explore block chain technologies as a way of increasing efficiency and improving regulatory control. The built-in benefits of the RUC block chain model can improve interjurisdictional operations in ground-breaking ways by simplifying processes and reducing operating costs.

Additional information about block chains is located in Appendix C.

Shared Account-Manager-Based Reconciliation

A fourth alternative is for states to form an account manager certification compact, and then select commercial account management services from vendors approved by that compact. If a small number of account managers provide RUC services for all jurisdictions, they can collect RUC due from motorists and (assuming location-aware reporting technology) remit funds directly to the jurisdictions to which they are due. This system potentially eliminates the need for a clearinghouse, but also potentially limits competition and could, in time, raise operational costs.



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Chapter 2: Interjurisdictional RUC

2.1. Objectives of this Chapter

The objectives of this chapter are to extend work performed under Phase 1 of the Interjurisdictional RUC Policy Study carried out for WRUCC in 2014 by defining the following:

- ▶ Amount of cross-border traffic in the various jurisdictions
- ▶ Cost and revenue estimates associated with various approaches to interjurisdictional RUC assessment
- ▶ Cost and effort estimates associated with enforcement of interjurisdictional RUC

2.1.1. States included in the analysis

Following from discussions during the project kick-off meeting, it was determined that Arizona, California, Colorado, Idaho, and Washington would be the states examined in this project. They present a diversity of geography, economic bases, population distribution, long-distance travel generators, and proximity to international borders.

Figure 4. States in Study Region



Nationally, there has been a trend of increasing household vehicle miles traveled (VMT) over the last five decades, especially for commute-to-work and recreation (Figure 6). The five states included in this analysis share the overall trend of increasing VMT (Figure 5) and increasing distance traveled by trip type.



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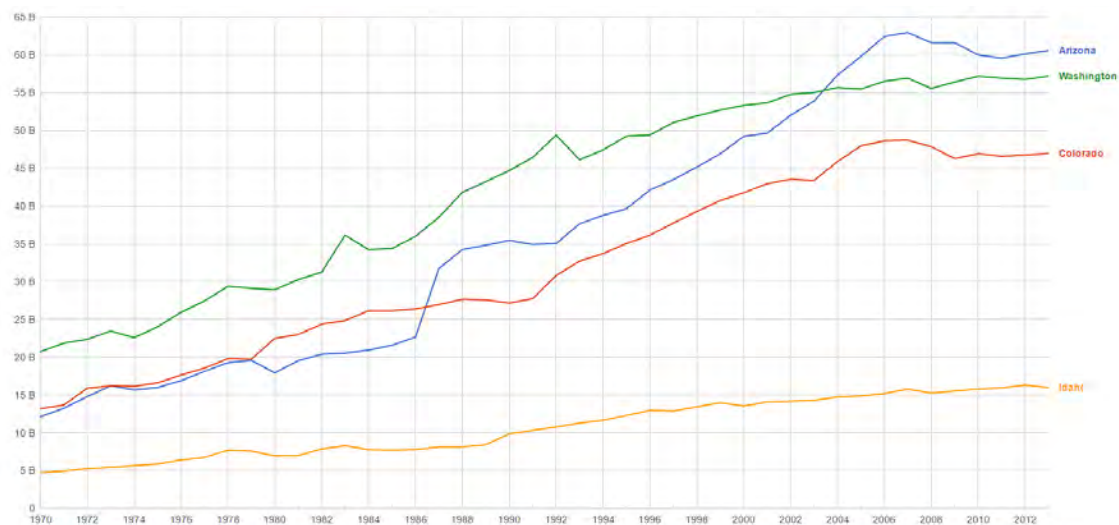


Figure 5. VMT, 1970-2013, for Arizona, Colorado, Idaho, and Washington

2.1.2. Vehicles Included in the analysis

The cost and revenue estimates undertaken in this study focus on the impacts of visiting passenger vehicles. Large trucks used primarily for freight movements are not included in this study, since interstate motor carriers operating between any of the 48 contiguous states and 10 Canadian provinces already participate in the International Fuel Tax Agreement (IFTA) and provide the following information on a quarterly basis:

- ▶ Total miles, taxable and nontaxable, traveled by the licensee's qualified motor vehicles in all jurisdictions, IFTA and non-IFTA, including trip permit miles
- ▶ Total gallons of fuel consumed, taxable and nontaxable, by the licensee's qualified motor vehicles in all jurisdictions, IFTA and non-IFTA
- ▶ Total miles and taxable miles traveled in each member jurisdiction
- ▶ Taxable gallons consumed in each member jurisdiction
- ▶ Tax-paid gallons purchased in each member jurisdiction, and
- ▶ Current tax rates for each member jurisdiction



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Figure 6. Average Annual VMT Per Household



This allows the IFTA clearinghouse to distribute motor fuel taxes to the jurisdiction in which a motor carrier operated. Because interstate motor carriers already have a tax revenue reconciliation process in place, they are not considered in this study.

Further, rental-car fleets are not included as a separate entity when assessing the costs and revenues associated with assessing RUC on visitors. It is assumed that because rental cars are registered in the state where they are based, the bulk of “visitor” driving will be accounted for as part of any in-state process. In instances where drivers rent a car in one jurisdiction and then drive it into another jurisdiction, the vehicle would be treated as any other passenger vehicle driving outside its home jurisdiction.

2.2. Organization

This chapter is organized as follows:

- ▶ Section 3 describes the methodology used to identify the number of vehicles crossing state borders each day, estimate visitor travel, and estimate the revenue implications of that travel.
- ▶ Section 4 describes unique issues in each of the participating states that influence visitor travel, and the impact of that travel on potential road user charge revenues.
- ▶ Section 5 identifies the amount of cross-border travel in each of the participating states, and characterizes that travel.
- ▶ Section 6 discusses the revenue implications of visitor travel for each of the participating states



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- ▶ Section 7 identifies the costs associated with assessing road user charges on visitors under the three policy bases examined in this study, and estimates the costs associated with operating a multilateral clearinghouse for revenue reconciliation
- ▶ Section 8 identifies issues associated with enforcing RUC on visitors, and identifies factors that could influence the effectiveness of enforcement, as well as the cost of enforcement efforts.

2.3. Methodology

To explore the revenue implications of charging, or not charging, visitors for road use, we developed a parametric model of visitor traffic volume in each of the participating states. Traditional travel models typically describe travel as either internal/internal, internal/external (or external/internal), and external-external, as illustrated in Figure 7. For the purposes of this project, internal/internal travel – that is to say travel originating and taking place entirely within the home jurisdiction– is not examined. The model assumes the bulk of interstate travel is external/internal, with only a small percentage of passenger vehicles driving through entire states and thereby creating external/external travel. Further, it assumes most travel is round-trip, meaning that each vehicle that enters a host jurisdiction returns to its home jurisdiction by the same or similar route. As a result, total external VMT is likely over-estimated. However, without significant additional detailed survey data, the model cannot be further calibrated.



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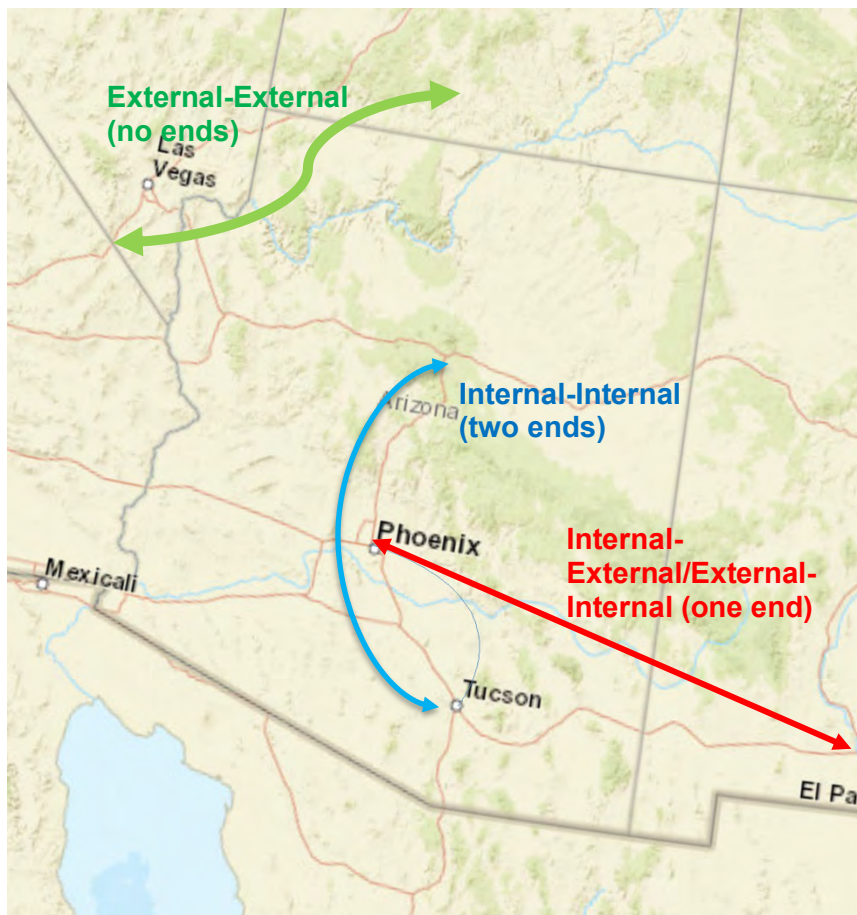


Figure 7. Model Travel Types

The model estimates external/internal travel within each of the participating states – that is to say it estimates the amount of travel that occurs inside a state that originates outside the state. Inputs to the model included the long-distance trip table from the 2001 National Household Travel Survey (NHTS), traffic volumes from the states' 2013 Highway Performance Monitoring System (HPMS) reports, and data about major long-distance trip generators and trip tables produced by statewide models, when available. Because varying data is available for each state, the NHTS and HPMS data form the core of the model, with refinements made to each state based on additional information available for that state. The specific data sources used for each state are discussed later in this chapter.

The analysis of revenue and cost implications for assessing RUC on visitors is limited to passenger vehicles and light trucks. Nearly all long-haul heavy trucks, and certainly those that operate across state lines, already report mileage by jurisdiction to IFTA, which has a revenue reconciliation and audit system in place.



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2.3.1. Estimating Visitor Travel

The model divides external/internal travel into two distinct types – short-distance and long-distance. Short-distance travel is the type encountered when metropolitan areas straddle state boundaries, or when two metropolitan areas are found on either side of the border, in relatively close proximity as illustrated in Figure 8. In these locations, vehicles make frequent, short trips across state lines. This type of interstate travel occurs in the Lake Tahoe area, Portland, Oregon-Vancouver, Washington, and Coeur D'Alene, Idaho-Spokane, Washington, among others. Commuting to work and travel to conduct personal business such as shopping, attending school, and medical appointments are the primary reasons people undertake short-distance interstate travel.

2.3.1.1. Short-Distance External/Internal Travel

Short-distance interstate travel is typically already modeled to some degree by the various Metropolitan Planning Organization (MPO) travel demand models, although they do not generally assign a state of origin to all road use. Most multi-state MPOs have agreements in place for allocating federal construction and maintenance funding from each state to projects in the MPO. Some MPOs have adopted a formula-based method that takes into account population and VMT in each jurisdiction for allocating funding.

The model developed for this analysis assumes that 90-95% of passenger vehicles crossing state borders in one of these short-distance travel zones is local travel. The estimate is on the lower end for the Lake Tahoe region, due to it being a regional tourism and recreation destination and the higher end of that range for the remaining cross-border local traffic.

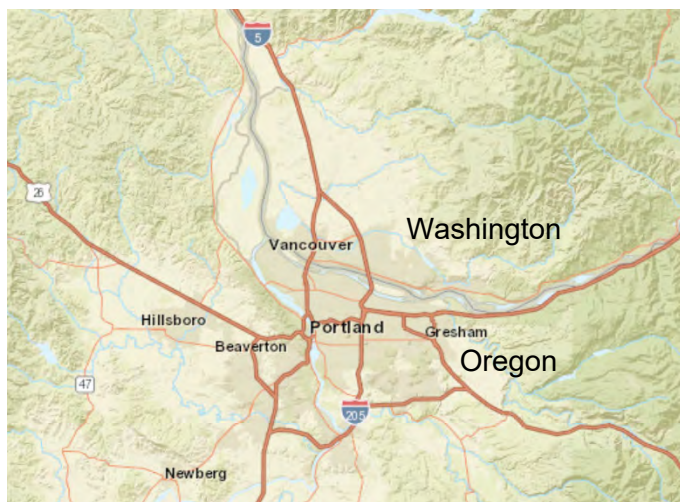


Figure 8. Example of short-distance external/internal travel zone: Portland, Oregon -- Vancouver, Washington



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2.3.1.2. Long-Distance External/Internal Travel

Long-distance travel is also challenging. For this study, “long-distance” is defined as trips originating outside the state visited, and not inside one of the short-distance border zones. Over the years, various distances have been used to define “long-distance” in travel surveys. For instance, the 2001 NHTS defined long-distance travel as a trip of at least 50 miles from home to the farthest destination reached, while the 1995 American Travel Survey (ATS) defined a long-distance trip as a trip of 100 miles or more. For the purposes of this report, long-distance travel is interstate travel with origin or destination points outside one of the border zones defined as “short-distance” interstate regions. Examples of long-distance travel would include Phoenix, Arizona to Los Angeles, California and Portland, Oregon to Seattle, Washington. The main categories of long-distance travel include:

- ▶ Pleasure trips
 - > Visiting friends/relatives
 - > Touring to experience scenic beauty, history and culture
 - > Camping, hunting, fishing, hiking, and boating
 - > Attending special events such as a fair, festival, or sporting event
 - > Casino
 - > Theme park
 - > Resort (ocean beach, inland or mountain resort)
 - > Skiing/snowboarding
 - > Golf
- ▶ Business trips, exclusive of commuting.
- ▶ Personal business
- ▶ Commute to work



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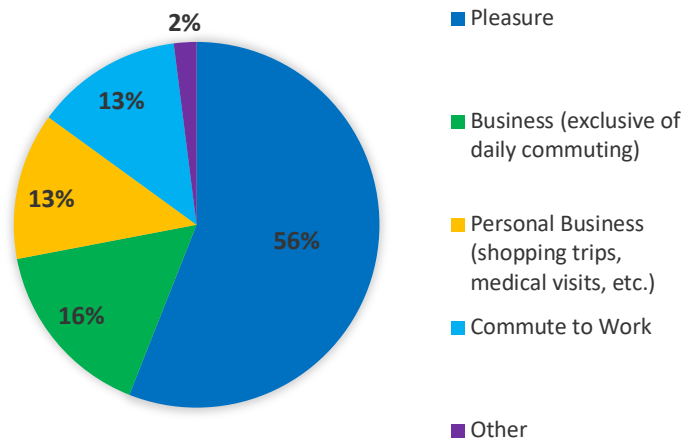


Figure 9. Purpose of Trips Longer than 100 Miles Round-Trip. Source: *The 2001 National Household Travel Survey, preliminary long distance file*, U.S. Department of Transportation.

Nationally, domestic long-distance travel (defined as a trip of more than 50 miles from home) has been increasing at a rate of about 2% per year since 2010. Growth has largely been in the area of leisure trips, while business trips have declined. Data from the 2001 NHTS indicates that for trips of less than 2000 miles (round-trip), people have tended to prefer personal vehicles, and personal vehicles are used for more than 89% of trips with a round-trip distance of at least 100 miles (Table 1). Air travel dominates on trips longer than 1000 miles (one-way).

Table 1. Percent of Long-Distance Travel by Mode and Distance in US

		Round Trip Distance (miles)					Total
		100-299	300-499	500-999	1000-1999	2000+	
Mode	Personal Vehicle	97.2	94.3	85.9	53.9	22.2	89.5%
	Air	0.2	1.5	10.3	42.4	74.8	7.4%
	Bus	1.6	3.4	3.2	2.6	1.4	2.1%
	Train	0.9	0.7	0.6	0.9	0.8	0.8%
	Other	0.2	0.1	0.0	0.1	0.8	0.2%

Source: *The 2001 National Household Travel Survey, preliminary long distance file*, U.S. Department of Transportation.



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At the same time, most long-distance trips (62%) also take place within the home state (Table 2). Figure 10 shows the distribution of long-distance trips by census region.

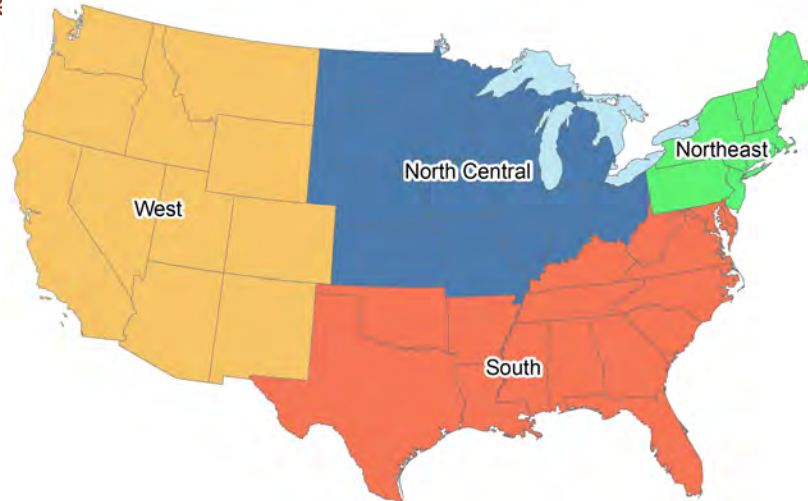


Figure 10). However, while a majority of long-distance trips occur entirely within the same state, they account for only about 27% of miles traveled (by all modes). An additional 24% of miles traveled are to a different state in the same census region. All of the states discussed in this report are located within the West Census Region.

Table 2. Distribution of Long Distance Trips in the Continental United States (all travel modes)

	Trips	Miles Traveled
Same State	62%	27%
Different State, Same Census Region	25%	24%
Different Census Region	11%	33%
International (outbound)	2%	16%
Total	100%	100%

SOURCE: *The 2001 National Household Travel Survey, preliminary long distance file*, U.S. Department of Transportation.



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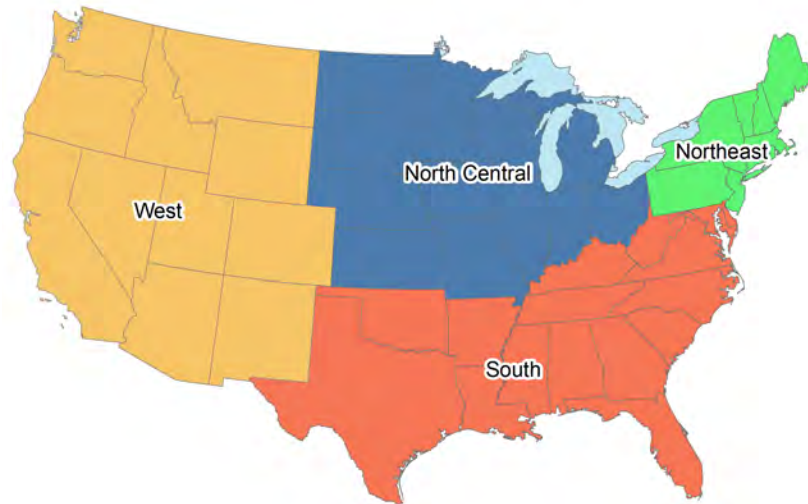


Figure 10. U.S. Census Regions

Altogether, these data suggest that up to one in four long-distance trips originating in the western states will have a destination in another western state, and that personal passenger vehicles are likely to be the primary travel mode in at least 85% of cases.

2.3.1.3. External-External Travel

External-External travel refers to those vehicles that drive through a state without stopping. While passenger vehicles make a significant number of external-external trips through the smaller states in New England, the longer distances involved with traversing states in the western U.S. significantly limits the amount of external-external passenger vehicle traffic in the region.

The model estimated external-internal and internal-external traffic at the state level using traffic volumes at state border crossings and applying a gravity model to assign incoming traffic to various locations along each major route. With a few notable exceptions, it assumes drivers covering the long distances typical of state-to-state travel in the western region of the United States primarily choose access-controlled or dual-carriageway facilities when they are available, for reasons of both safety and convenience. Therefore, routes included in the long-distance portion of this analysis are limited to those defined in the federal aid system as Interstate, Principal Arterial – Other Freeways and Expressways, and Principal Arterial – Other. These three categories of route encompass all Interstate highways, U.S. Highways, and most State Highways and other major thoroughfares.



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2.3.2. Analysis Steps

2.3.2.1. Identify traffic volumes

This step accomplishes the first objective of the study in that it identifies the amount of cross-border traffic in the various jurisdictions. While the amount of cross-border traffic alone does not fully account for all visitor travel, it is a key parameter, since a basic assumption of this analysis is that the visitor-generated traffic of interest is generated by vehicles that drive into the host state from another state. Visitors who arrive in the host-state by a mode other than their personal vehicle (e.g. airplane, train, bus) and then rent a car are assumed to be operating under the same RUC system as residents. Therefore, any travel they undertake is not “visitor travel”.

The primary data source for cross-border traffic counts is each of the states' 2013 HPMS reports. The traffic volumes reported in HPMS include truck volumes. For state-to-state travel where truck volumes are not available from either the Freight Analysis Framework (FAF) or a statewide model, trucks are assumed to be an average of 5% of cross-border travel. Specific exceptions to this assumption are noted in the discussion for each state. For international crossings, the proportion of trucks can be as high as 50% of all vehicles, depending on the point of entry. U.S. Customs and Border Patrol (CBP) reports annual passenger vehicle crossings separate from bus, train, and truck crossings. These figures were used to “true-up” total traffic volumes reported in HPMS. The overall impact of an assumed 5% truck volume in the absence of other data is a slight over-statement of the importance of passenger vehicles.

2.3.2.2. Identify key travel generators

Once the number of vehicles crossing into or out of a state is established, the next step is to identify likely destinations.

Short-distance interstate travel zones feature travel generators such as schools, churches, and workplaces typically found in traditional 4-step travel demand models. However, long-distance external-internal travel is more likely to be destined for special generators such as tourist and recreation destinations (Figure 11).



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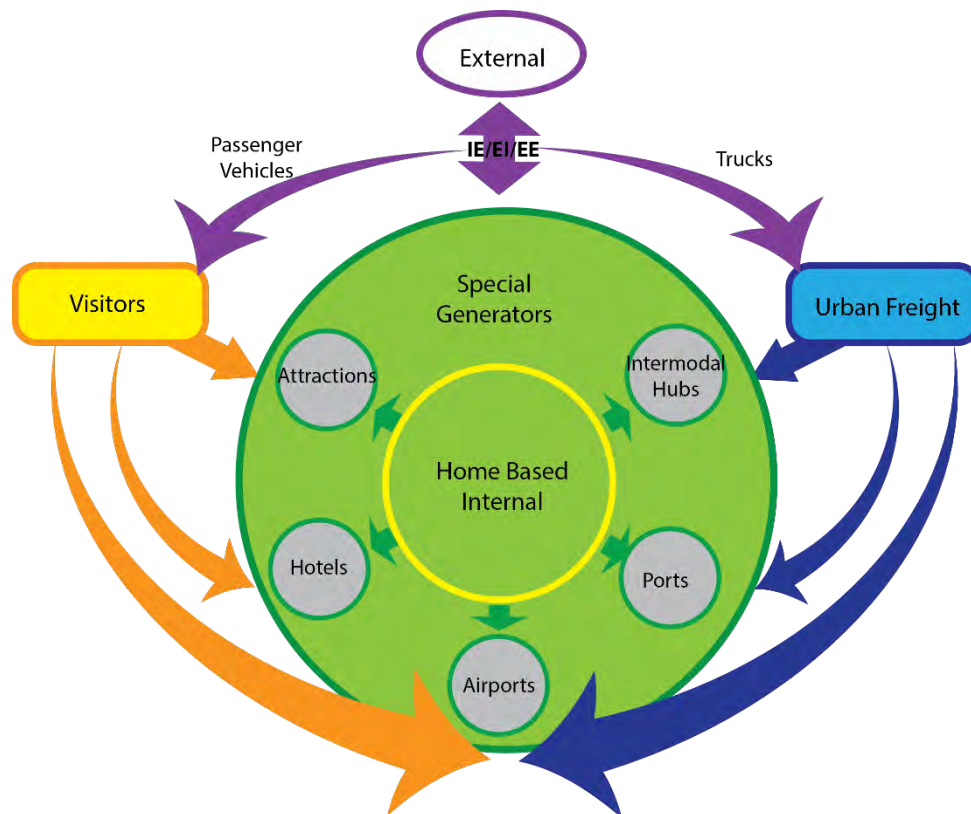


Figure 11. Vehicle Split and Special Generators in and IE/EI Travel Model

2.3.2.3. Gravity Model

A simple gravity model was employed to conduct a parametric estimation of visitor travel within each participating state. Parameters driving the model include:

- ▶ Typology of each gateway
 - > Short-distance
 - > Long-distance
- ▶ AADT at each gateway
- ▶ Distance(s) to major travel generators
- ▶ Relative “pull” of travel generators across state lines
- ▶ Estimated decay rate of passenger vehicle travel

In the absence of detailed data about external/internal travel generated by specific generators (resorts, theme parks, etc.), the model assumes a linear distance decay function between gateways and destinations. Short-distance travel gateways are assumed to have a lower proportion of through-traffic than are long-distance gateways.



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2.3.3. Scenarios for Visitor Travel

While people travel for any number of reasons, there are a limited number of taxation or road charging scenarios under which motorists engage in interstate travel.

- ▶ **Scenario 1:** A visitor whose home state imposes motor fuel taxes, but not RUC, enters and drives in a neighboring RUC state, then returns to their home state
- ▶ **Scenario 2:** A visitor whose home state imposes RUC enters and drives in a neighboring RUC state, then returns to their home state
- ▶ **Scenario 3:** A visitor whose home state imposes motor fuel taxes, but not RUC, drives through multiple states, some of which impose RUC, some which do not
- ▶ **Scenario 4:** A visitor whose home state imposes a RUC drives through multiple states, some of which impose RUC, some which do not
- ▶ **Scenario 5:** A visitor drives into a RUC state from outside the U.S

These scenarios all generate slightly different assumptions about the costs and revenues associated with assessing RUC on visitors. For instance, in scenario 1 if a motorist fuels their vehicle in their home jurisdiction and immediately crosses into the host jurisdiction, drives 200 miles and returns home without paying a distance-based charge, the home jurisdiction receives all the revenue, even though roads in the host jurisdiction take all the wear (Figure 12). If, on the other hand, the visitor enters the host jurisdiction and then purchases fuel, under some RUC policy bases the loss to the host jurisdiction may be less because fuel tax is collected on the visitor in lieu of RUC.

Due to the variety of scenarios for visitor travel and variety of methods of assessing and collecting RUC under each policy basis, potential revenue from a visitor-generated RUC and costs associated with collecting it are estimated as ranges. At the lower-end of costs, and higher-end of revenues would be a situation where a visitor travels from one RUC jurisdiction into another, and has a location-aware mileage reporting device. Under a strictly distance-based charge the home jurisdiction simply issues an invoice on behalf of both itself and the host jurisdiction, and then remits any amount due to the host jurisdiction through one of the reconciliation methods described above. At the higher-end of costs, and lower-end of potential revenues would be a situation where a RUC state establishes a pre-paid distance permit for visitors. Such as system could require significant IT investment to develop a visitor permit database, and would likely have a high evasion rate and carry heavy enforcement costs.



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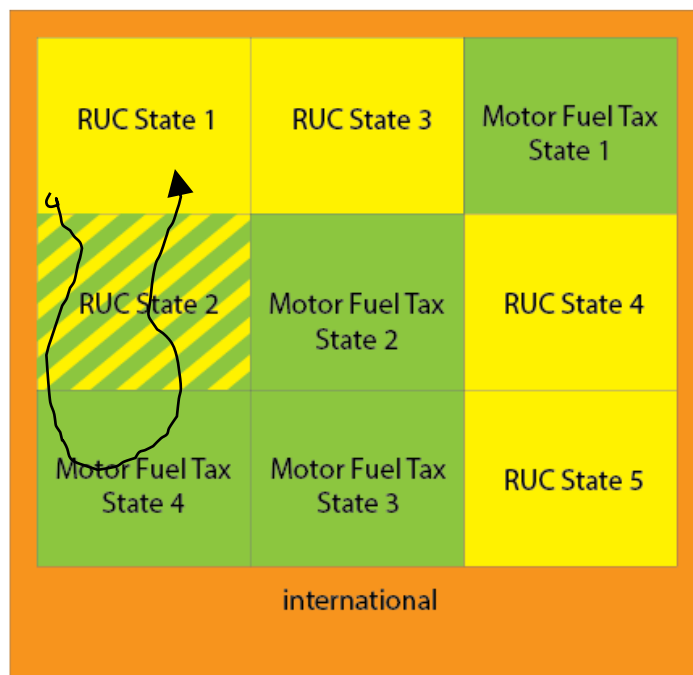


Figure 12. Scenario 1 Worst Case: Fuel Tax Arbitrage

2.3.4. Estimating Revenue Implications

Because none of the states participating in this study have formally established per-mile rates for RUC, the evaluation of revenue implications of charging, or not charging, out-of-state drivers is done in terms of revenue that can be expected to be gained or lost relative to a state's in-state RUC revenue, estimated cost of collection, and estimated cost of enforcement. As such, the outputs of this portion of the model are dimensionless and presented as a range.

Revenue estimates also assume the state has an operational RUC system in place, and any revenue generated from visiting passenger vehicles represents a marginal increase over RUC generated by state residents.

2.3.5. Estimating Costs Associated with Assessing RUC on Visitors

As with estimates of revenue implications, estimates of costs associated with assessing RUC on visitors assume each of the five states has an operational RUC system in place. The estimated costs associated with charging visitors are the marginal costs incurred by states to levy and collect RUC from visitors under various scenarios. Note that costs associated with cash-flow disruptions potentially arising from transition from motor fuel tax to RUC are not considered.



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2.3.6. Estimating Costs Associated with Enforcement

Enforcement of RUC payment by visitors offers many challenges if motor fuel taxes are not in place. For methods that require direct payment of distance-based charges to the host jurisdiction, visitors may need to be required to register their vehicle in the host jurisdiction in order for most automated enforcement methods such as automatic license plate readers to be used. Cost estimates for enforcement efforts are presented as a range for each policy basis examined in this study, in order to account for the variations in reporting methods, account management, and the administration of RUC for visitors.

2.3.7. Data Sources for Long-Distance Travel

2.3.7.1. Traffic Volumes for All Participating States

To ensure consistency, baseline border traffic volumes were determined using Annual Average Daily Traffic volumes (AADT) reported by the states as part of their 2013 HPMS reports to the Federal Highway Administration (FHWA). Because this data item includes trucks, the figure was adjusted using truck volumes reported by the states.

In addition to the baseline traffic volumes for all states, we considered additional data sources such as statewide travel models and travel data collected from mobile phones by companies such as INRIX and AirSage. At this time, statewide travel models for the participating states lack sufficient information about external travel (specifically jurisdiction of origin) to be useful, although California's model was used to validate estimates derived from our model. Further, current services such as INRIX and cellular data aggregators do not typically provide origin-destination data for long-distance travel. To date, their services have evolved to support local or MPO-level travel demand models, which consider "external" to be external to the MPO planning area boundary, not external to the state.

2.3.7.1.1. *Arizona*

At the present time, Arizona's statewide travel model does not provide information about external travel behavior. Arizona is participating in the 2016 NHTS and plans to use the add-on element of the survey to improve information about long-distance trips.

2.3.7.1.2. *California*

This analysis used origin-destination (O-D) matrices for external travel from California's Statewide Travel Demand Model (CSTDV2). While California's statewide model does include travel modes such as Air and Rail, only passenger vehicles and light trucks were used to assess implications of assessing a road user charge on visiting vehicles. Limitations of the model include not capturing external-to-external (E-E) travel for passenger vehicles.

2.3.7.1.3. *Colorado*

Colorado has just begun the process of developing a statewide travel demand model. Data from the FAF was used to refine estimates of truck volumes.



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2.3.7.1.4. Idaho

Idaho is nearing the end of development of a statewide model that uses cell-phone data as a primary data source for developing O-D matrices.

2.3.7.1.5. Washington

Washington does not have a statewide model at this time.

2.3.7.2. General Limitations of the Data

AADT was pulled from the states' HPMS reports because they provide consistency across the region. However, the AADT reported has several limitations. Directionality (D-Factor) is not included in the publicly-available dataset, so, for purposes of modeling interstate passenger travel, all volumes are assumed to have a 50-50 split (50% inbound traffic, 50% outbound). While this assumption may not always hold for local traffic, for interstate traffic, particularly when measuring volumes of visitors to states, it is likely to hold. Every visitor that drives into a jurisdiction eventually drives out of it.

Another general limitation of the data is that the AADT represents *average* daily volumes over the course of a year, so it does not capture seasonal trends. And, the AADT reported in the publicly-available data set includes truck volumes.

Due to variations in the methods states use to collect traffic counts and calculate AADT, there are some (usually minor) inconsistencies in volumes reported along a route as it crosses state boundaries. In most cases the difference is less than 2% of the reported volume, but there are some instances where the traffic volumes reported at essentially the same location by two states is more noticeably different. In cases where there was obviously a data reporting error, the presumptively more correct value was used, as illustrated in Figure 13. The "450" reported by Jurisdiction A near the border with Jurisdiction B is likely an error, given that volumes along the rest of the route are consistent. In this case, the value of 4500 reported by Jurisdiction B is used to estimate traffic in Jurisdiction A.

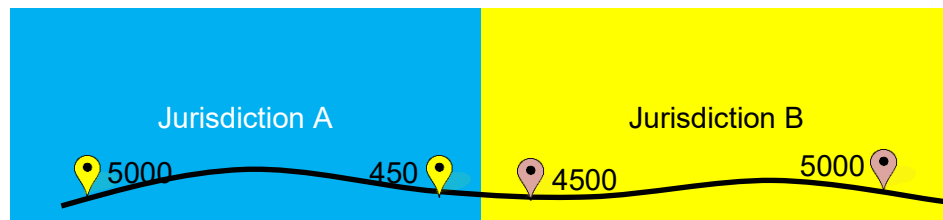


Figure 13. Illustration of AADT Correction

Finally, because external travel survey data and detailed electronic data (such as that supplied by INRIX) do not currently exist at a level of detail sufficient to identify state of origin of external travel, this analysis focuses on miles driven in the destination state but cannot identify jurisdictions of origin or estimate funds due to any external jurisdiction.



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2.4. Unique Issues of Participating States

While common typologies exist, each of the participating states has unique characteristics and issues that influence visitor behavior. The number and nature of international points of entry, tourist destinations that function as travel generators, and presence of commuter-driven interstate travel vary by state and are described below.

2.4.1. Arizona

2.4.1.1. International Land Ports of Entry

- ▶ Douglas
- ▶ Lukeville
- ▶ Naco
- ▶ Nogales
- ▶ San Luis
- ▶ Sasabe

2.4.1.2. Tourist Destinations

- ▶ Grand Canyon
- ▶ Glen Canyon National Recreation Area
- ▶ Monument Valley (Arizona/Utah border)
- ▶ Hoover Dam (Arizona/Nevada border)
- ▶ Sedona

2.4.1.3. Other Unique Issues

Arizona DOT staff report that they are unable to conduct state-sponsored cordon surveys for the purpose of gathering data on travel behavior, including long-distance and interstate travel.

2.4.2. California

2.4.2.1. International Land Ports of Entry

There are six border ports of entry for passenger vehicles to California.

- ▶ San Ysidro
- ▶ Otay Mesa
- ▶ Tecate
- ▶ Calexico West
- ▶ Calexico East
- ▶ Andrade

2.4.2.2. Tourist Destinations

- ▶ Disneyland
- ▶ San Francisco Bay Area



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- ▶ San Diego-Tijuana
- ▶ Lake Tahoe
- ▶ Major Ski Resorts
 - > Squaw Valley, Heavenly Mountain, Mammoth Mountain
- ▶ National Parks

2.4.2.3. Short-Distance I-E zones

- ▶ Lake Tahoe
- ▶ San Diego - Tijuana

2.4.3. Colorado

External passenger vehicle travel to Colorado is driven primarily by tourism, although there is also significant business-related travel to the state.

2.4.3.1. International Land Ports of Entry

Unlike the other states in this study, Colorado does not have any international land ports of entry.

2.4.3.2. Tourist Destinations

- ▶ Denver is the largest tourist destination in the state, although a significant number of visitors arrive by air
- ▶ Pikes Peak region
- ▶ Mountain West resort area, which includes Eagle, Grand, Gunnison, and San Miguel, among others

2.4.3.3. Short-Distance I-E zones

- ▶ Fort Collins, CO – Cheyenne/Laramie, WY

2.4.4. Idaho

External travel to and from Idaho is driven largely by east-west freight movement (which is not considered here because it takes place on heavy vehicles) and tourism.

2.4.4.1. International Land Ports of Entry

- ▶ Eastport (U.S. 95)
- ▶ Porthill (SH 1)



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2.4.4.2. Tourist Destinations

Tourism is the third largest industry in Idaho, behind agriculture and technology¹. As with other states in this study, more overnight passenger trips originate from within Idaho than other states, followed by Washington, California, and Utah.

2.4.4.3. Short-Distance I-E zones

- ▶ Spokane, Washington – Coeur D'Alene, Idaho
- ▶ Lewiston, Idaho – Clarkson, Washington
- ▶ Moscow, Idaho – Pullman, Washington

2.4.5. Washington

2.4.5.1. International Land Ports of Entry

Washington has several border ports of entry, including:

- ▶ Point Roberts
- ▶ Blaine - Peace Arch
- ▶ Blaine - Pacific Highway
- ▶ Lynden
- ▶ Sumas
- ▶ Nighthawk
- ▶ Oroville
- ▶ Ferry
- ▶ Danville
- ▶ Laurier
- ▶ Frontier
- ▶ Boundary
- ▶ Metaline Falls
- ▶ North Cascades National Park

2.4.5.2. Tourist Destinations

Significant tourism destination in Seattle, with a number of both Canadian visitors stopping in Seattle.

- ▶ The I-5 corridor offers city-based touring and whale watching/wildlife tours
- ▶ Cascades
- ▶ Mount Hood
- ▶ Mount Rainier

¹ The Idaho Tourism Effect, <https://visitidaho.org/content/uploads/2016/11/Southwest-tourism-Impact-Infographic.pdf>



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- ▶ Numerous National Forests

2.4.5.3. Short-Distance I-E zones

- ▶ Portland, Oregon – Vancouver, Washington
- ▶ Spokane, Washington – Coeur D'Alene, Idaho
- ▶ Lewiston, Idaho – Clarkson, Washington
- ▶ Moscow, Idaho – Pullman, Washington
- ▶ Blaine-Bellingham, Washington – Surrey, British Columbia

2.5. Estimates of Cross-Border Travel in Various Jurisdictions

Cross-border travel for the five participating states was calculated from the states' 2013 HPMS report, as well as detailed data on incoming passenger vehicles published by U.S. Bureau of Transportation Statistics². Since this study is concerned only with light vehicles, the raw AADT reported in HPMS is downward-adjusted to remove heavy vehicle traffic. In cases where precise counts of passenger vehicles were available, those figures were used. Otherwise, it was assumed trucks account for 5% of total AADT.

2.5.1. Arizona

Approximately 215,000 passenger vehicles enter or leave Arizona each day. Interstate 10 and Interstate 40 carry considerable east-west traffic through Phoenix and Flagstaff, respectively. Interstate 40 also carries a significant number of travelers on their way to visit Grand Canyon National Park.

Based on data from the 2001 NHTS, the states contributing the most long-distance travel to Arizona include Arizona, California, New Mexico, Texas, and Illinois.

In order to estimate VMT by visitors, 4 gateway zones were defined:

- ▶ Z1: Crossings from California to Arizona
- ▶ Z2: Nevada and Utah to Arizona (Grand Canyon routes)
- ▶ Z3: Nogales-area ports of entry
- ▶ Z4: New Mexico to Arizona

² https://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BCQ.html



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Zones 1, 3, and 4 are treated as long-distance external-to-internal crossings while zone 2 is examined as short-distance travel zones.



Figure 14. Traffic Flows, Arizona



Figure 15. Arizona Gateways

2.5.2. California

Nearly 385,000 passenger vehicles each day cross into or out of California each day. While this is a substantial number of crossings, it is a very small fraction (0.5%) when compared to the nearly 100 million daily passenger trips taken by California residents. Even when only long-distance travel is considered, most long-distance (destination greater than 50 miles from home) passenger vehicle travel in California is undertaken by California residents and both originates and terminates in the state. This number includes a significant number of super-commuters. Figure 17 identifies the primary states of origin for long-distance passenger vehicle travel to and in California. While Nevada and Arizona send a fair number of visitors, more than 86% of all long-distance passenger vehicle travel in California originates and ends in California.



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In order to estimate VMT by visitors, 7 gateway zones were defined:

- ▶ Z1: Crossings from Oregon to California
- ▶ Z2: Northern Nevada (to just north of Carson City) to California
- ▶ Z3: Lake Tahoe metropolitan area
- ▶ Z4: Southern Nevada to California
- ▶ Z5: Arizona to California
- ▶ Z6: Mexico to California
- ▶ Z7: Tijuana-San Diego metropolitan area

Zones 1, 2, 4, 5, and 6 are treated as long-distance external-to-internal crossings while zones 3 and 7 are examined as short-distance travel zones. These are illustrated in Figure 16.



Figure 16. California Gateway Zones



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Figure 17. State of Origin for Long-Distance Driving Trips to California. Source: Author's analysis of 2001 NHTS.

Two regions in California have significant amounts of short-distance cross-border travel: the Lake Tahoe and San Diego-Tijuana areas.

2.5.3. Colorado

Approximately 75,000 passenger vehicles enter or leave Colorado each day at one of the 18 border crossings included in this study. Twelve of the crossings are low-volume facilities, with AADT less than 4,000 vehicles per day. Interstate 70 (Colorado-Kansas and Colorado-Utah) and Interstate 25 (Colorado-New Mexico and Colorado-Wyoming) account for 52% of vehicle movements into and out of Colorado. Volume is focused on Denver and Colorado Springs, and on the Interstate 70 and U.S. 40 routes to recreational areas. External-external travel is rare outside of heavy trucks.

In order to estimate VMT by visitors, 5 gateway zones were defined:

- ▶ Z1: Colorado Springs – Cheyenne/Laramie
- ▶ Z2: Utah to Colorado
- ▶ Z3: Northwest New Mexico to Southwest Colorado
- ▶ Z4: Eastern New Mexico to Eastern Colorado
- ▶ Z5: Kansas and Nebraska to Colorado

Zones 2, 3, 4, and 5 in Colorado are treated as long-distance external to internal gateways. Zone 1 is treated as a short-distance commuter region.



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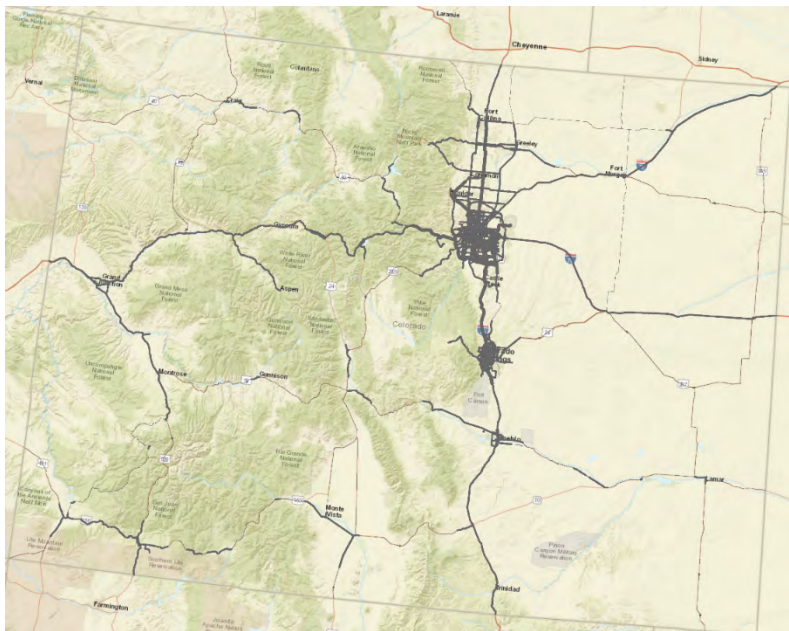


Figure 18. Traffic Flow Map, Colorado

Of overnight trips originating outside Colorado, about 52% of visitors travel in personal vehicles originating in another state.

2.5.4. Idaho

Approximately 179,000 passenger vehicles enter or leave Idaho each day. As described above, a majority of these are bound for recreational facilities. The exception is local travel in the Coeur d'Alene, ID – Spokane, WA and Lewiston, ID – Clarkson, WA areas.

In order to estimate VMT by visitors, 7 gateway zones were defined:

- ▶ Z1: Canada to Idaho
- ▶ Z2: Oregon to Idaho
- ▶ Z3: Nevada and Utah to Idaho
- ▶ Z4: Wyoming and Montana to Idaho
- ▶ Z5: Coeur d'Alene, ID – Spokane, WA
- ▶ Z6: Lewiston, ID – Clarkson, WA
- ▶ Z7: Washington to Idaho (exclusive of Spokane and Clarkson)

Zones 1, 2, 3, 4, and 7 are treated as predominantly long-distance external-to-internal crossings while zones 5 and 6 are examined as short-distance travel zones.



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Figure 19. Traffic Flow Map, Idaho

2.5.5. Washington

Approximately 469,000 passenger vehicles enter or leave Washington each day.



Figure 20. Traffic Flows, Washington



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2.6. Revenue Implications of a Multi-Jurisdictional RUC

This section describes revenue *potential* for assessing RUC on visitors. It is important to note that the true revenue implications of a multi-jurisdictional RUC vary depending on the policy basis adopted and RUC methods used because administration costs and compliance are likely to vary widely.

2.6.1. Distance-Based Charge

If a jurisdiction opts to assess RUC on visitors strictly on a distance basis, the jurisdiction must have a system in place that can capture all visitor travel, or be willing to accept significant leakage. In the absence of a GPS mandate and national RUC program, distance-based charges for visitors are the most likely to lead to uncollected revenue for host jurisdictions, especially those that rely on manual distance methods for visitors.

2.6.2. Shadow Charge

Shadow charges are likely to be an effective method of multijurisdictional RUC assessment, provided sufficient data are available to model both distance driven and home jurisdictions of drivers, and that all jurisdictions participate in a shadow charge system. The effectiveness of the shadow charge as a revenue generation method is highly dependent on the effectiveness of each jurisdiction in collecting RUC on all miles driven by its residents. Jurisdictions with a combination of (1) poor performance in measuring and collecting RUC for residents and (2) small proportion of visitor travel could possibly see net revenue loss compared with not assessing RUC on visitors at all.

2.6.3. Distance-Based and Fuel-Based, with or without Shadow Charges

Jurisdictions adopting a combination of distance-based and fuel-based RUC for visitors have the freedom to assess RUC directly only on those visitors that are already using a location-aware RUC reporting method in their home jurisdiction, while still collecting a RUC proxy for most visitors in the form of a gas tax. A key assumption, of course, is that visitors purchase gas in the host jurisdiction. For long-distance travel, leakage under this policy basis is similar to the current situation – sometimes residents purchase fuel outside the home jurisdiction, but sometimes visitors purchase fuel in the host jurisdiction. However, in cases where there is short-distance interjurisdictional travel and one jurisdiction does not charge a motor fuels tax, this policy basis could lead to all drivers purchasing fuel in the jurisdiction without a gas tax, thereby creating significant revenue leakage for the other jurisdiction. Particularly in this situation, a shadow charge may be necessary to ensure use taxes are ultimately remitted to the appropriate jurisdiction. This form of the shadow charge must take into account the fact that some RUC and gas tax revenue may have already been reconciled for those drivers using approved reporting methods in participating jurisdictions, or be calibrated some agreed methodology to account for those who paid RUC directly.



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For the states examined, potential revenue to be gained by assessing RUC on visitors ranges from about 1% to as high as 11% of RUC generated by residents. These estimates represent potential gross revenues, exclusive of costs of collection and enforcement.

2.6.4. Arizona

As much as 11% of VMT driven in Arizona originates outside the state, with non-resident driving most likely accounting for between 5% and 8% of total annual VMT. Unlike the other states examined in this study, there is very little short-distance interjurisdictional travel in Arizona -- the high percent of externally-originating VMT is driven by a large number of outdoor tourist destinations such as the Grand Canyon, Prescott National Forest, and Lake Havasu.



2.6.5. California

Visitor-generated VMT is estimated to be between 1.2% and 2.6% of statewide VMT on an annual basis.



2.6.5.1. San Diego/Tijuana urban agglomeration

Included in that estimate is the San Diego/Tijuana urban agglomeration, which presents a unique case. Approximately 7.4 million crossings are made each year at the San Ysidro Port of Entry by U.S. citizens and legal residents in order to work, shop, or attend school in San Diego. Assuming they travel on weekdays within the greater San Diego area, this group could contribute as many as 200 million miles to San Diego's annual VMT. It is unknown how many of these daily commuters register their vehicles in California. For those that do, participation in the resident RUC program should ensure they are complying with any state RUC. However, some number of these daily commuters are likely to register their vehicles in Baja California. Because



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Tijuana is outside the US and Mexico does not currently participate in the IFTA Clearinghouse, it is unlikely a shadow charge could be collected by California. In this instance, direct distance charges levied on vehicles crossing the border may be the only mechanism for assessing RUC on residents of Mexico who commute daily. A pre-paid mileage permit could be sufficient to address the issue but would be challenging to enforce.

2.6.6. Colorado

Visitor-generated VMT is likely to be between 1.1% and 4.4% of statewide VMT on an annual basis.



2.6.7. Idaho

As much as 10% of Idaho's VMT may be generated by non-residents. Long-distance travel is estimated to account for approximately 5% to 7% of statewide VMT, while the cross-border short-distance traffic generates 1.5%-2.5% of statewide VMT.



2.6.8. Washington

Visitor-generated VMT is estimated to be between 5% and 8.6% of total VMT in the state. Short-distance local travel could be as much as 4% of all VMT in the state (50-80% of all visitor generated VMT) due to significant local cross-border traffic between Vancouver, BC -- Bellingham, WA, Portland, OR -- Vancouver, WA, and numerous smaller cities and towns along the Washington/Idaho border.



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2.7. Costs Associated with Multi-Jurisdictional RUC Reporting and Reconciliation

2.7.1. General Description of Costs

The cost model used to estimate costs associated with setting up and operating a multi-jurisdictional RUC reporting and reconciliation system considers four broad categories of costs: Operational, Account Management, Enforcement, and Audit. Because several states are included in this study, wage rates, transaction costs, IT costs, and various capital expenses are estimated based on prevailing *national* standards.

Also, operational costs presented here assume a fully-mature RUC system and do not factor in any transition period. Finally, all costs are presented as marginal costs beyond those already incurred by states managing a state-level RUC system for residents.

Operational Costs

Operational costs include items like administrative staffing, IT expenses, facilities maintenance, and communications costs. For the purposes of this study, start-up capital expenses are included in this category but are calculated and presented separately.

Administrative staffing

Administrative staffing encompasses all staffing support necessary to operate a program. Staffing may include program managers, project managers, and other administrative support staff. Administrative staff costs do not include specific staffing costs associated with database/IT maintenance, creation of reports about visitor travel for use by the clearinghouse, audit, or enforcement costs, all of which are covered in other categories. In the analysis of costs associated with assessing RUC on visitors, it is assumed each state already has an operational RUC system in place and administrative staffing costs shown represent only the marginal increase likely to be necessary to extend the program to include non-residents. Clearinghouse operations, on the other hand, are assumed to be independent of any state or provincial RUC program and are estimated as such.



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Database/IT maintenance

Regardless of the policy basis adopted or method of assessing RUC on visitors, RUC states may incur some IT requirements associated with multijurisdictional RUC that are beyond those required for a single-state RUC system. Examples range from storing aggregate mileage by jurisdiction to being able to interface with financial clearinghouse systems. Identifying these IT requirements early in the design of a RUC system is likely to significantly reduce the cost of including them. Modifying existing state or account manager systems to store and transmit multijurisdiction data has a different set of expenses and results in higher overall costs.

A clearinghouse will have separate IT costs, related to accepting, storing, and analyzing data from participating jurisdictions, and transferring funds to jurisdictions.

Facilities costs

Facilities costs include the costs of purchasing, constructing, or renting real property and facilities required to administer a RUC program or clearinghouse.

Electronic communications costs (only under some scenarios)

Electronic communications costs include both cellular communications (OBDII or smartphone mileage reporting technology to an account manager) and fixed network communications (transmittal of data between from account managers to states and between states and clearinghouse). These costs are represented as marginal increases above any costs incurred in the operation of a state-level RUC program.

Account Management Costs

Transaction Costs

Transaction costs include a range of expenses including bank and credit card fees and compensation to third parties that assist in collecting mileage data or reconciling collected funds (this includes transaction costs to states for services provided by a clearinghouse). Transaction costs are relatively static across various RUC policy bases since they are driven largely by external factors (e.g. credit card fees are set by the banking industry).

Collection and Administration Costs

Collection and administration costs include all costs required to collect RUC, exclusive of those captured under the administrative staffing and transaction costs categories. This includes any payments to commercial account managers, the costs of creating and mailing invoices, and expenses related to maintaining state oversight of RUC collection.



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As with other cost categories, the estimated cost of a multi-jurisdictional RUC is presented as the marginal increase of out-of-state RUC over costs incurred by an operational state-only system. Collection costs are relatively static across various RUC policy bases since they are driven largely by external factors (e.g. postage fees, prevailing wage rates).

Enforcement Costs

Enforcement costs include those costs associated with detecting and investigating non-compliance, issuing infraction notices, receiving responses to notices (either payment or dispute), supporting dispute adjudication, as well as collections costs. Costs can include both capital expenses (e.g., purchase and installation of roadside license plate readers) and ongoing operating expenses.

Due to the costs associated with enforcement, many similar programs such as state vehicle registration and toll operators assess various administrative fees and penalties on violators, both to encourage compliance and to recover costs associated with enforcement. Similar fees or penalties are not included here.

Audit Costs

Audit costs include those costs associated with conducting periodic audits of RUC programs, including clearinghouse activities. Costs estimated for state programs are limited to the marginal increase due to inclusion of out-of-state drivers or a financial clearinghouse in assumed program audit costs.

2.7.2. Costs Associated with Assessing a Shadow Charge

Cost categories associated with assessing a shadow charge may include the following, above and beyond existing systems and costs incurred by states:

- ▶ Operational Costs
 - > Creation of both statewide and regional travel models
 - > Regular maintenance of travel models
 - > Administrative support costs within each state
 - > Database/IT costs
- ▶ Audit function costs within each state
- ▶ State-level costs associated with participating in a funds reconciliation clearinghouse (these are detailed in section 6.6 and not included in the totals presented in this section)

The largest cost associated with assessing a shadow charge is likely to be the development of statewide and regional travel models that are capable of determining long-distance passenger travel within each state based on vehicle origin, and regularly conducting the travel surveys



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necessary to generate sufficient data to input into the models. External activity-based travel surveys are relatively expensive to conduct (in recent years per-sample costs for one and two-day surveys have been as high as \$200), and the typical single-day travel diary or survey used for MPO-level analysis is insufficient to gather meaningful data for long-distance out-of-state visitors who may be expected to drive long distances over several days.

Options for long-distance travel modeling for shadow charges

A range of options exists for developing the long-distance travel data required to operate a shadow charge. These included cooperative development of a new regional passenger travel-demand model, modification of the mathematical simulation-based long-distance framework recently developed under FHWA's Exploratory Advanced Research Program, and use of travel patterns from RUC participants with location-aware reporting devices as a sample from which to estimate travel by jurisdiction for the larger population. In addition, alternative sources of travel pattern data, such as cell phone data, were modeled.

Long-distance travel models

1. Traditional statewide or regional travel demand model. These models are typically traditional 4-step travel demand models, but recently there has been interest in the development of activity-based models. It is not uncommon for development costs for statewide models to run into the millions of dollars. Further, technical staff will be required to maintain and run the model. Importantly, these models may have other uses, so the costs would not be allocable strictly and fully to a RUC program.
2. USDOT recently completed a study titled *Foundational Knowledge to Support a Long-Distance Passenger Travel Demand Modeling Framework*³ as part of its Exploratory Advanced Research Program which developed a preliminary mathematical model of long-distance passenger travel, which is essentially a simulation that anticipates travel behavior. For those states that participate in NHTS add-on surveys or already have a mature statewide model, an extension of the model developed in this study may be adequate for assessment of a shadow charge. This option carries significant additional development costs, although they are less than option 1, as well as technical staff to maintain and run the model.
3. Parametric model based on data collected for state-level RUC programs by location-aware mileage metering devices (OBDII dongles and mobile phone apps). Initial model development costs will be significantly less than option 1, however the data output will be suitable only for estimating interstate travel for RUC purposes. Technical staff will be

³ Available at http://www.fhwa.dot.gov/policy/modelframework/model_framework.pdf



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required to maintain and run the model, although fewer than either option 1 or option 2 because far less data are involved.

Long-distance travel data

1. Traditional travel surveys
2. Another option for procuring some of the necessary data on long-distance travel is for states to purchase cell-phone data, either individually or as a collective. Idaho Department of Transportation has actively pursued the use of cell phone data as a source of travel data inside the state as part of its statewide model development. While cell-phone generated trip data lacks several important elements required for detailed travel modeling (such as mode choice, trip purpose, or trip origin (for instance, cell phone data are unlikely to adequately capture a vehicle's home state), it can provide important information about the distances people drive once they cross the border into the host-state. This, used in combination with detailed travel surveys, could support shadow charging.
3. Data obtained from RUC participants using location-aware technologies.

Short-distance travel modeling for shadow charges

The analysis of mileage data collection costs and enforcement costs suggests that the shadow charge is the least costly method of assessing RUC on “visitor” in those metropolitan areas that span state lines and those with significant near-border generators⁴. However, those MPOs may find it necessary to incorporate additional model elements into their existing travel demand models to support shadow charging.

2.7.3. Summary of start-up and operational costs associated with assessing a shadow charge

Due to the wide variety of methods a group of states might adopt in order to assess a shadow charge, the cost of doing so is presented as a range, and start-up costs (assumed to be 1-time costs) are separated from ongoing operations. Start-up costs are estimated to be between \$425,000 and \$2.74 million, depending on the type of model used to assign external travel to both home and host jurisdictions. Start-up costs also include the costs incurred by a state to develop agreed standards and specifications with other states.

Ongoing operational costs are also influenced by the choice of model used to assign external travel since they have varying ongoing data requirements, hardware and software requirements,

⁴ This is true except for the San Diego-Tijuana urban agglomeration. See the more detailed discussion on page 32.



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and staff support requirements. Ongoing operations are estimated to range from \$175,000 to \$544,000 annually.

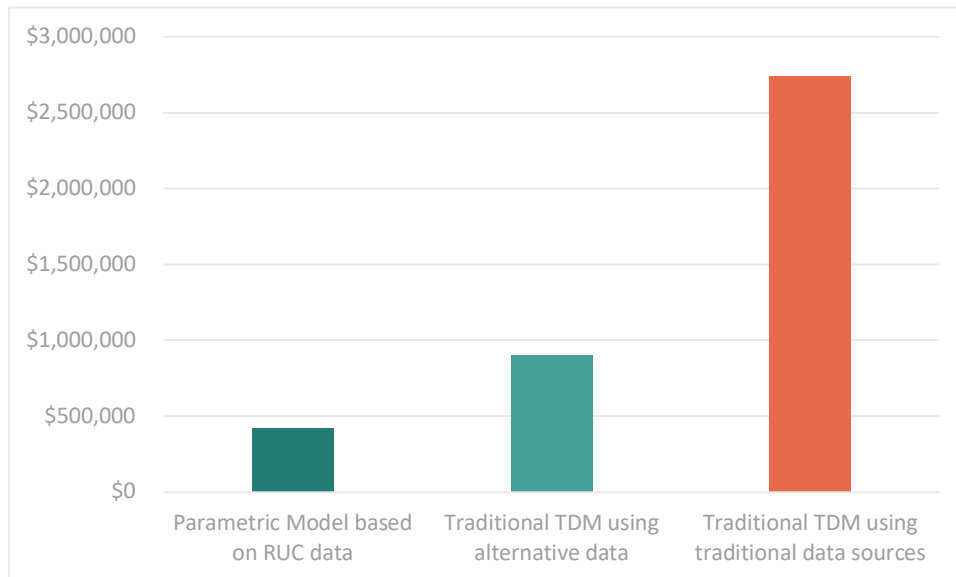


Figure 21. Estimated startup costs for shadow charges

2.7.4. Costs Associated with Assessing a Distance-based Charge

Of the three policy bases examined, a pure distance-based charge on visitors is the most expensive to administer. Every visitor would have to either purchase a pre-paid mileage permit, valid for a set number of miles (for instance, 1,000 or 5,000), be assessed a RUC charge as they leave the state, which requires registration of odometer readings on entry and exit, or have a location-aware device that is known to the host jurisdiction. Cost categories associated with assessing a distance-based charge on visitors include the following:

- ▶ Operational costs
 - > Administrative staffing
 - > Database/IT maintenance
 - > Transactional costs
 - > Facilities costs (only under some scenarios)
 - > Electronic communications costs (only under some scenarios)
- ▶ Account management costs
 - > Transaction Costs
 - > Collection and Administration Costs
- ▶ Enforcement costs
- ▶ Audit costs



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Scenario 1: No location-aware technology in vehicles and distance-based charges are assessed in real time directly by the state.

Under this scenario, it is necessary for the state to collect odometer readings for non-resident vehicles as they enter and leave the state, and to maintain these data in a database for some period of time. This would require states to establish physical facilities at gateways, staff those facilities, maintain a database of non-resident license-plate (or VIN) numbers and odometer readings, and maintain resources to collect either cash or credit-card payment. Cost estimates for a single facility could range into millions of dollars annually if several are required for each jurisdiction, so this scenario is considered cost prohibitive, to say nothing of the political challenges it could encounter.

Scenario 2: No location-aware technology in vehicles and distance-based charges are administered through a pre-paid mileage permit.

In this scenario, visitors to the state purchase a block of miles to “spend” while in the host-jurisdiction. This analysis assumes permits are purchased on-line and that the bulk of enforcement is performed via automated license plate readers. Fifty-five camera sites with 416 cameras were modeled; California will likely require more, Idaho fewer. The costs associated with this policy basis depend in large part on whether a state already offers a pre-paid distance permit to its residents. If it does, IT startup costs will be significantly lower.

Table 3. Multijurisdictional RUC using Mileage Permits

CATEGORY	START-UP COSTS (CAPEX)	OPERATIONAL EXPENSES (ANNUALIZED)
IT	\$ 2,000,000 to \$25,750,000	\$ 5,266,000
Administrative Staffing		\$ 1,400,000
Account Management		\$ 8,075,000
Enforcement	\$ 9,984,000	\$ 220,520
Audit		\$ 450,000
Totals	\$ 35,734,000	\$ 15,411,520

Scenario 3: Some drivers have a location-aware mileage reporting method and report mileage in host-jurisdiction to their home-jurisdiction while visitors without a location-aware mileage reporting method purchase a pre-paid mileage permit.



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Costs are the same as Scenario 2.

Scenario 4: All drivers have a location-aware mileage reporting method in their vehicles are reporting mileage by jurisdiction to their home state or account manager.

Under this scenario, the only costs are those related to membership in a financial clearinghouse. However, this option requires a GPS mandate for all states, so is very unlikely to be implemented.

2.7.5. Costs Associated with Assessing a Combination of Distance-based and Fuel-based Charges

Under this policy basis, we assume the only motorists being assessed a distance-based charge are those already participating in their home state's RUC program with location-aware mileage meters and all other pay the motor fuel tax.

The cost model developed for this policy basis has the following assumptions:

1. All states continue to assess a motor-fuel tax that is paid when motorists fuel their vehicles.
2. States and account managers are already differentiating mileage by jurisdiction for those motorists with location-aware reporting technologies like OBDII dongles and mobile phone apps.
3. Visitors without a location-aware RUC reporting device pay the gas tax. Visitors with a location-aware RUC reporting device pay the gas tax but have that amount deducted from the RUC-due calculated by their account manager or home state. This does require each state and account manager maintain current tax rates for all jurisdictions in order to calculate out-of-state RUC.
4. All states report aggregate mileage by jurisdiction to the clearinghouse.

If these assumptions hold true and the state is a member of the financial clearinghouse, there are minimal additional costs other than those costs associated with participating in the clearinghouse (discussed in Section 6.6).

2.7.6. Costs Associated with Operating a Clearinghouse

Costs associated with operating a revenue clearinghouse include:

- ▶ Operational costs for the clearinghouse (external to state costs)
 - > Office rent or mortgage costs
 - > Transactional costs
 - > Database/IT maintenance
 - > Administrative staffing



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- ▶ Audit costs for the clearinghouse (external to state costs)
- ▶ Administrative support costs within each state
- ▶ Audit function costs within each state

Assumptions about the operations of the clearinghouse drove values input into the cost model. For instance, the assumed data and funds flow is:

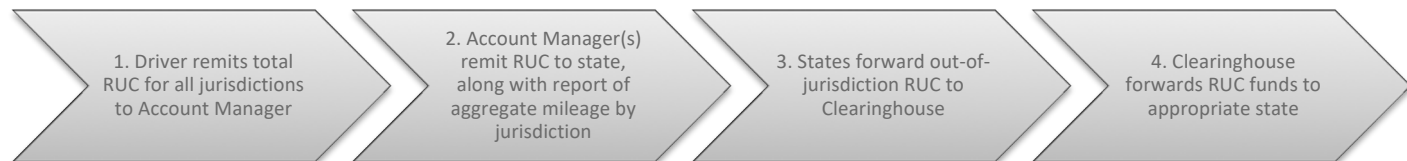


Figure 22. Generalized Clearinghouse Process

A second model was also considered, and produced similar costs:

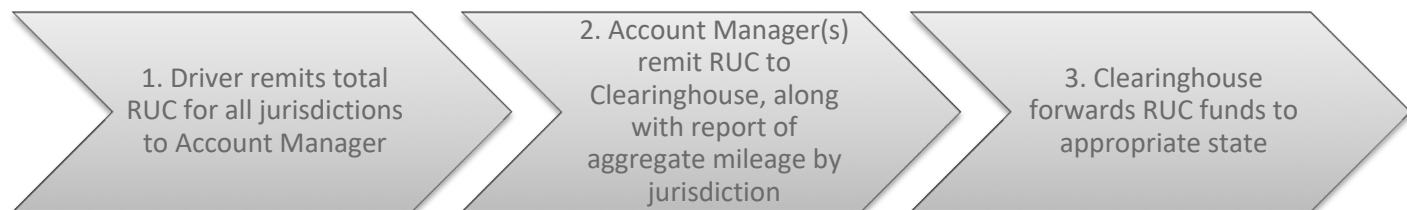


Figure 23. Alternative Clearinghouse Process

Reduced transaction costs at the state level (caused by removing step 3 in the generalized process) were offset by an assumed increase in state-level audit costs.

It was also assumed the clearinghouse will operate independently from any state or provincial government. As such, it will require office space, staff, and will incur standard overhead expenses.



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Table 4. Costs Associated with Operating a Clearinghouse

Category	Startup Expenses	Ongoing Operating Expenses (annualized)
	Clearinghouse Expenses	
Office Rent or Mortgage costs	\$45,000	\$62,000
Transactional costs		\$139 per transaction per state ⁵
Database/IT maintenance	\$ 8,000,000 ⁶	\$148,000
Administrative staffing		\$700,000
Audit costs for the clearinghouse (external to state costs)		\$10,000
Participating State Expenses (expenses apply to each participating jurisdiction)		
Administrative support costs within each state		\$59,317.79
Database/IT maintenance within each state	\$500,000 - \$1,500,000	\$8,400
Audit function costs within each state		\$11,863.56

2.8. Enforcement of Multi-Jurisdictional RUC

Promotion of compliance should be a priority for any road usage charge system, as perceptions of ease in avoiding or defrauding the RUC will undermine revenue and be more expensive to address after a system has been introduced. Enforcement can be carried out with a mix of roadside infrastructure (identify chargeable vehicles and checking through communications and license plate recognition technology if such vehicles have active accounts or have registered or paid for road use) and mobile enforcement units (identifying on the charged network vehicles that may have not paid, and stopping them).

Enforcement should carefully segregate the issuing and pursuit of fine payment from the pursuit of charge debt. Typically, fines or other penalties for violations of the charging system become

⁵ Assumes financial transactions occur via EFT on a quarterly basis.

⁶ Includes hardware and software procurement.



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part of general government revenue from fines. However, unpaid charge debt remains essentially a civil debt, which must be pursued separately (and once recovered forms part of the revenue of the RUC system). In toll systems in many states, administrative charges may be levied as part of unpaid toll debts. Road usage charge systems in other countries vary in their approach to levying additional charges for non-payment, such as “administrative charges”, that *do not* comprise fines. Best practice would indicate having distinct systems and responsibilities for pursuing unpaid charge debts from the pursuit of penalty fines for offenders.

Likely methods of RUC evasion fall into four prominent categories:

- ▶ Failure to report miles driven
- ▶ Reporting false information
- ▶ Claiming improper exemptions, credits, or refunds
- ▶ Failing to pay assessed RUC

Multi-state cooperation in RUC collection is likely to improve the effectiveness of collection and enforcement efforts. The enforcement process is illustrated in Figure 24 and begins with violation detection (discussed above). Beyond the usual challenges of enforcing paying of a tax, in a multi-jurisdictional RUC context states (or provinces) must be able to collect that tax from non-residents.

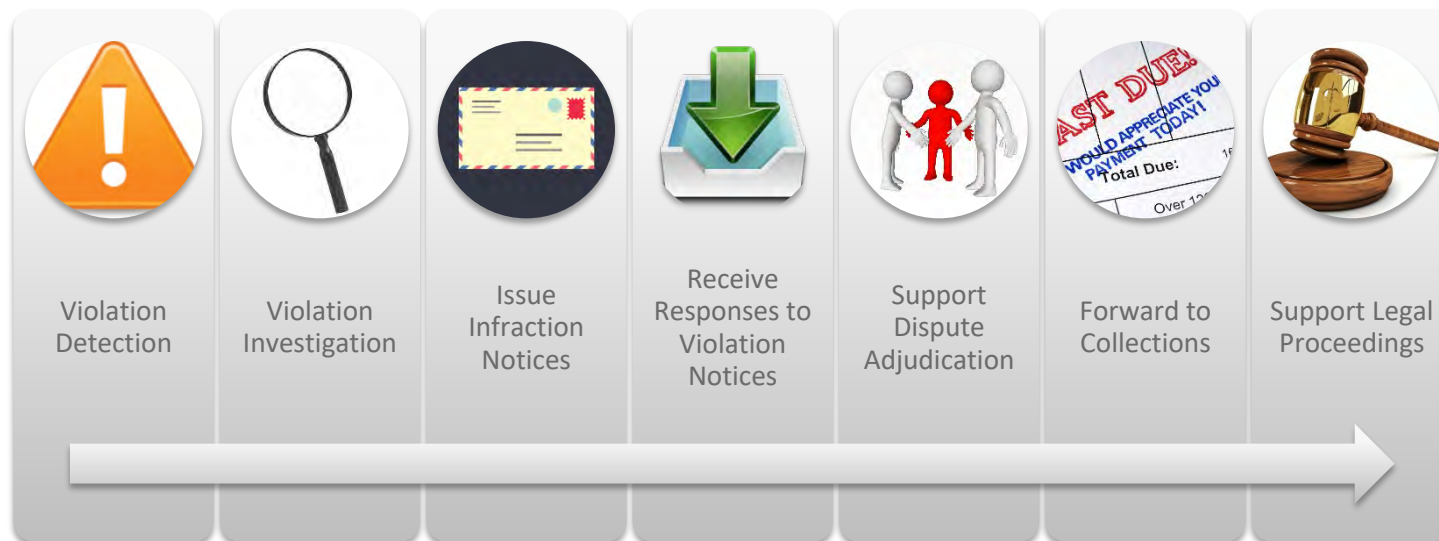


Figure 24. Simplified Enforcement Process



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2.8.1. Enforcement Scenarios

There is a tremendous range of enforcement methods and activities jurisdictions can undertake to maximize visitor RUC collection. But regardless of the tools used, multi-jurisdictional enforcement efforts will fall into one of three categories.

2.8.1.1. Universal retention of motor fuels taxes

By far the simplest method of “enforcement” is for all jurisdictions to continue to levy motor fuels taxes. This acts as a sort of deposit against future RUC due. When a driver reports and pays their RUC, they can be reimbursed for gas taxes paid. This scenario is not without some complications and in situations where jurisdictions charge significantly different motor fuel tax rates there is some potential for individuals to evade full payment (for instance, by purchasing all fuel in the low-tax state even when the bulk of their driving is in the high-tax state). It does, however, ensure all drivers (except PEVs) are paying something.

2.8.1.2. State by state enforcement

Under this enforcement scenario, each state has responsibility for detecting violations, issuing infraction notices, and collecting RUC due, plus any administrative fees, fines, or other charges. A benefit of this scenario is that states’ existing enforcement mechanisms are applied to visitors, likely with little or no additional cost. A major weakness of this approach, though, is that violators can only be engaged when they are physically present in the host jurisdiction. Demand letters can certainly be mailed to the violator’s home address, but other penalties such as suspension of driver license, blocks on vehicle registration, and administrative penalties or fines are likely not enforceable.

2.8.1.3. Multi-jurisdiction compact

State by state enforcement is only effective when the violator is present in the jurisdiction where RUC is due. Since multi-jurisdictional RUC systems, by definition, levy RUC on visitors (non-residents), pursuing payment outside the host-state could be problematic. The RUC administrative body in State A likely has no authority to take action against residents of State B, beyond straightforward collection of a debt. Other penalties, such as inability to renew driver licenses or motor vehicle registration would not be available. So, it is likely desirable that states engaging in multi-jurisdictional RUC form a multi-jurisdiction enforcement compact. The U.S. Driver License Compact provides one model.

In the past, states struggled with state-by-state enforcement of traffic fines and developed a system for sharing violation information so that violations by non-residents can be enforced in the home state.

According to the National Center for Interstate Compacts, the Driver License Compact “is an interstate compact used by States of the United States to exchange information concerning license suspensions and traffic violations of non-residents and forward them to the state where they are licensed known as the home state. Its theme is One Driver, One License, One Record.



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The home state would treat the offense as if it had been committed at home, applying home state laws to the out-of-state offense. The action taken would include, but not be limited to, points assessed on a minor offense such as speeding and suspension of license or a major violation such as DWI/DUI. It is not supposed to include non-moving violations like parking tickets, tinted windows, loud exhaust, etc.”⁷

Within the U.S., this model is likely to be more effective than state by state enforcement, with only marginal additional cost to pre-existing enforcement activities to support a secure database of offenders. It should be noted, however, that such an agreement with either Canada or Mexico would likely require action by all involved national governments, and depending on the amount and type of information shared between jurisdictions, action by the U.S. Congress.

⁷ <http://apps.csg.org/ncic/Compact.aspx?id=56>



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Chapter 3: Special Considerations for International RUC

3.1. Introduction

RUC-West and some of its member states have already begun to explore some of the issues related to assessing a RUC on international visitors through Interjurisdictional Study Phase 1 and Task 2 of this study, as well as its initial planning for a multistate regional RUC pilot project. This chapter expands the discussion in Chapter 2 to more closely examine RUC concepts at international borders. Because motorists from other countries are not likely to have any account-based relationships with either a US state or federal government agency (for example, property taxes, a US drivers' license or vehicle registration, a public utility connection, etc.), requiring these visitors to pay a RUC will likely require special mechanisms to facilitate proper payment. Providing these mechanisms will likely add additional start-up and operational costs to any RUC program. However, as was shown in Chapter 2, in some states there is significant travel by international visitors, who cause wear on roadways.

3.2. Objectives of this Chapter

The objective of this chapter is to identify issues that states in the US should consider in designing and implementing a RUC program capable of collecting revenue from motorists visiting from Canada or Mexico. This chapter is intended to inform the design of a future operational RUC system, rather than the design or operations of a pilot system.

3.3. Background

In Chapter 2 of this study, potential RUC revenues and costs were estimated for three different RUC policy bases:

- ▶ **Distance-based Charge.** Under a distance-based charge, motorists are assessed a charge based on the number of miles driven in a given jurisdiction. This requires direct measurement of miles driven in each jurisdiction and reporting of those mileage to either a state-managed RUC agency or a RUC account manager. Methods of measurement are wide-ranging and include (but are not necessarily limited to):
 - > automated methods such as a location-enabled OBDII dongle or smartphone app,
 - > manual methods such as:
 - requiring motorists to report their vehicle information and odometer reading upon entering and leaving a jurisdiction, with subsequent invoicing and RUC collection
 - manual inspection of odometers at border crossing stations, with subsequent invoicing and RUC collection
 - sale of mileage permits



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Under a distance-based charge, jurisdictions could assess RUC directly on visitors; that is to say an Oregon resident traveling in Washington would receive an invoice from and make payment to Washington. Alternatively, all mileage driven by a motorist could be invoiced by the home jurisdiction, and the various states could reconcile RUC amongst themselves.

The costs of these options varies widely, as does the reporting burden placed on the individual motorist.

- ▶ **Shadow Charge.** Under a shadow charge, states would not directly levy road usage charges on visitors. Rather, states would reconcile funds based on some estimate of the amount of visitor-generated vehicle miles traveled. The shadow charge can reduce costs associated with assessing and enforcing the RUC itself because each jurisdiction is concerned only with managing a RUC program for its own residents. However, the data required to adequately estimate not just VMT but also state of origin of visiting vehicles can be quite costly to collect. Over time and if an adequate number of jurisdictions implement location-aware mileage meters, data collected from RUC programs may be sufficient to calculate shadow charges.
- ▶ **Distance-based and fuel-based, with or without shadow charges.** Under this policy scenario, jurisdictions retain their motor fuel tax and, assuming a revenue-neutral RUC environment, refund fuel taxes paid to motorists.

Further, the chapter examined the costs associated with establishing a centralized clearinghouse model for interjurisdictional funds reconciliation.

While the basic policy scenarios described in Chapter 2 are valid for a variety of jurisdictional definitions (cities, counties, states, countries), there are some special characteristics of international RUC that deserve further consideration. Among these are questions about point of collection, enforceability of fines and penalties, currency conversion, and international acceptance of RUC measurement technologies.

3.3.1. International RUC Systems Elsewhere in the World

Though studied extensively, both by academics and by practitioners, implementation of international multi-jurisdictional road usage charging has thus far been limited to Europe, and primarily to heavy vehicle (HV) charging.



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RUC systems in Europe can be described as either time-based (vignette systems, which allow foreign motorists access to motorways for a designated period of time) and distance based. Those jurisdictions with heavy vehicle charging/tax systems in Europe, based on distance, are⁸:

- ▶ Austria
- ▶ Czech Republic
- ▶ Germany
- ▶ Hungary
- ▶ Iceland
- ▶ Poland
- ▶ Russia
- ▶ Slovakia
- ▶ Switzerland

Systems in Austria, the Czech Republic and Poland use Dedicated Short Range Communication (DSRC, also known as tag and beacon) technology to measure distance by zone on major motorways. Germany, Hungary, Russia and Slovakia use location-aware technologies (such as GPS-like systems) to measure distance (Switzerland uses such technology to support its primary measurement of distance by the electronic tachograph).

Some of these RUC systems charge heavy vehicles on all roads, but others only charge on motorways/expressways and other major national roads. All systems charge heavy vehicles with a Gross Vehicle Weight of 12 tonnes and above, but many also charge vehicles 3.5-12 tonnes. Figure 25 provides an overview of the current HV charge systems in the European Union (EU).

While some elements of EU RUC systems are instructive (such as permit distribution and enforcement activities) in a US context, most EU states have a shared currency and a common set of regulations. This is not the case with Canada, Mexico, and the US. Further, EU RUC systems are based either on time or use GNSS or DSRC technology to measure distance. Since GPS (the American GNSS system) is unlikely to be mandated in US RUC systems, experiences of distance-based methods in Europe are not directly transferrable to the North American context.

⁸ This does not include countries that charge all vehicles by distance on a conventional tolled network such as in Belarus and Portugal.



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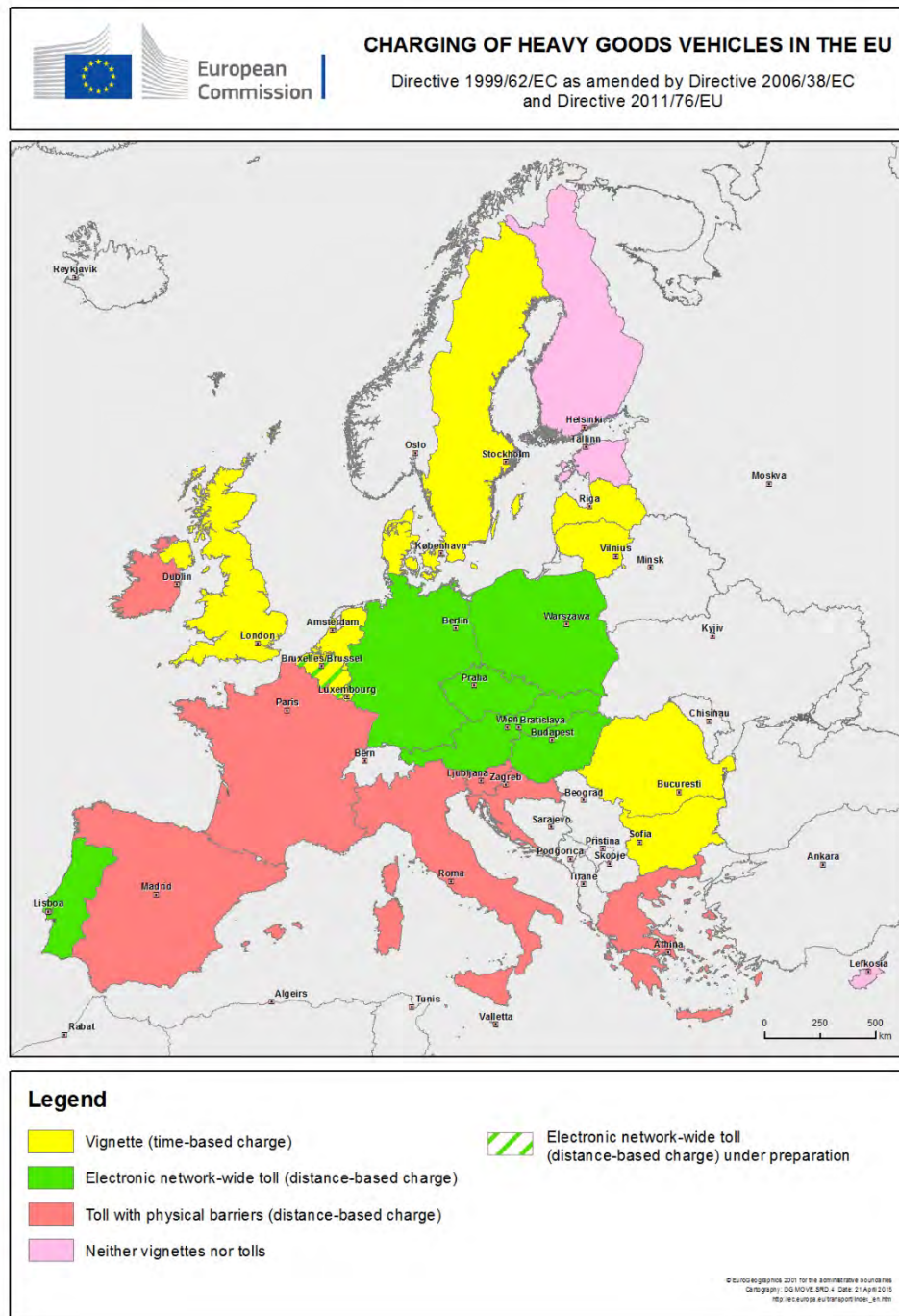


Figure 25: Heavy Vehicle Charging Systems in the European Union⁹

3.4. US Legal and Regulatory Issues Related to International Charging of RUC

The policy alternatives previously presented for charging out-of-state motorists included:



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- ▶ Assess a shadow-charge
- ▶ Charge based on **distance**
- ▶ Charge using a **combination of fuel-based and distance-based methods**

Regardless of the policy basis adopted, it is likely US states that adopt RUC will need to form relationships with several other jurisdictions that may or may not have adopted a RUC – each of which will have its own operational concepts, rates, charging methods, and administrative structures – to facilitate revenue collection and create a rational tax environment for motorists. In pursuing and establishing these capabilities, foundational legal principles, existing statutes and regulations must be observed when creating this future tax system. This section attempts to highlight the most salient of these issues for consideration.

3.4.1. Characteristics of multijurisdictional travel

In simplest terms, three possible scenarios exist for international motorists traveling into a US state. First, a visitor entering from a country that imposes the gas tax (but not a RUC) drives on US roadways before returning home. Second, a visitor entering from a province or state that imposes a RUC drives on US roadways then returns home. And third, an international visitor travels through multiple states, some that impose RUC, some that have a combination RUC/fuel tax, and others that collect only fuel taxes.

3.4.2. Complications Arising from Interjurisdictional Travel Scenarios

For the purposes of this chapter, the long-range operational scenario is that a RUC would entirely replace the state's gasoline tax at least for passenger and light-duty vehicles. However, during a transitional phase of RUC implementation, it may be necessary or desirable to continue collecting the state's gas tax, crediting those taxes paid against a motorist's RUC invoice. In other words, for a period of time, the existing state gas tax acts as a pre-payment mechanism for the RUC. This approach is taken in Oregon's current RUC program, and is planned in Washington state's RUC pilot. In this transitional situation, the RUC collection agents or agencies need to know not only the miles traveled, but also the fuel consumed so that gas taxes paid can be calculated and credited back against the motorists' RUC account, thereby avoiding double-taxation for roadway use. In practical terms this means that under any sort of distance-based RUC, visitor vehicles would have to be "registered" with the US state or states they drive through. Sufficient vehicle information needs to be available (make/model/year) for fuel consumption estimates to be calculated as an offset to gas taxes paid.

3.4.3. Standards for Assessing a RUC on International Visitors

3.4.3.1. Existing Authority for Collection of Transportation-Related Taxes and Fees from International Motorists

New laws, policies and operations are probably required to assess RUCs on motorists from outside the US. As a starting point for understanding the legal concept of tax nexus, below is a summary of current requirements for payment of transportation-related taxes and fees:



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Table 5. Existing Authority for Collecting Transportation-Related Taxes and Fees

Transportation Tax or Fee	Description	Basis of Taxation
State Gasoline Tax	Per-gallon tax collected at the fuel terminal rack (wholesale level). The tax is passed on to consumers by increasing the retail price of gasoline by an equivalent amount.	Actual purchase in-state: For motorists: purchase of gasoline within a US state, regardless of motorists' state or province of residency or where gasoline is used.
Toll Roads	<p>Flat or variable-rate charge for motorists' travel on a specific lane, road or bridge. Toll exemptions vary by facility. Some toll bridges between the US and Canada are interoperable with US toll systems such as EZPass, and tolls may be paid in either US or Canadian dollars on either side of the border. Typically, however, tolls on either end of the bridges are collected by different companies. Some bridges have enacted a "currency parity policy", which allows for Canadian rates to be reviewed and adjusted twice each year to keep them in line with prevailing currency exchange rates.</p> <p>While many bridges on the US-Mexico border charge tolls (particularly on the Mexico side), there are no interoperable toll bridges between the two companies, and toll operations are completely separate.</p>	Actual use in-state: All non-exempt vehicles using the tolled facility must pay, including international vehicles.
Vehicle Registration Fee	Flat annual fee for all vehicles required to be registered in a state. Typically this requirement extends to residents of a state, although some states require additional categories of vehicles to be registered.	Presumptive use in state: Generally, registration fees are owed if the vehicle is based in the state (i.e. the owner/lessee is a resident).

For RUC, the most analogous use case is toll roads: the tax basis for both a RUC and toll roads is actual use of a road facility by a non-exempt vehicle (international vehicles are not exempt). However, a key difference is that when an out-of-state motorist uses a toll facility, the amount of usage (and thus the amount owed) is easily determined, because the price is based on the vehicle's presence traveling on a precisely defined segment of roadway. By contrast, the amount of roadway used by an international vehicle traveling on a US state's roads is not easily discoverable without a pre-existing mileage-recording device and a RUC account. A further complication is that the state's RUC agency has no established taxpayer relationship or account with international drivers. Therefore, it is unlikely pre-existing toll crossings could be leveraged to support any of the three RUC policy bases being examined here. They could, possible,



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support a concept similar to a time permit, or generic use permit, if an additional fee were charged at the toll bridge/tunnel for road use beyond the border. However, because it would be assessed with no indication of actual miles driven, it would not be a mileage permit.

One other vehicle-related “fee” that all motorists pay is for car insurance. Canadian passenger vehicle insurance, including liability, is in full effect in the US – no additional coverage is required for vehicles entering the country. Mexican liability insurance, however, is not effective in the US. Mexican vehicles with Mexican license plates must purchase special liability policies in order to have required coverage in the US. That said, proof of liability insurance is not typically required when crossing the border.

3.4.4. Legal Authorizations Required for Interjurisdictional Revenue Collection and Reconciliation

3.4.5. Authorizations and Agreements for Multilateral RUC Collection

In a future scenario where there are multiple states that impose RUCs, the most efficient (and legally advantageous) structure is for a single, uniform agreement to be entered into by and between all states. Whether that agreement takes the form of an interstate compact (which confers greater legal power in the administration and enforcement of the agreement) or a multistate agreement (similar to a cooperative or association agreement) depends upon the powers conferred (for example, if enforcement actions are included), and any state-specific restrictions on entering into agreements with other states. If the RUC agencies from each state are comfortable having an agreement that spells out specific roles and duties, without any legal enforceability between the states, an interagency memorandum of understanding (MOU) may be sufficient. An MOU is typically non-binding, cancellable at the will of the parties, and usually entered into in an open-book, full cooperation manner. However, if a more durable agreement that allocates responsibilities, costs and obligations – including the obligation for unpaid accounts – is desired, a more formal agreement such as a bi-state compact may be required. Under the U.S. Constitution, bi-state (or interstate) compacts are subject to the approval or consent of Congress under Article I, Section 10, if the scope of the compact would result in any encroachment or diminution of federal authority. In the context of a RUC system, no impact on federal authority is envisioned, so Congressional approval of the compact would not be required. However, each state has its own requirements for state-level approval of bi-state or interstate compacts. Many states require compacts first to be approved by the state legislature before the compact can be forwarded for Congressional approval or, if Congressional approval is not required, before the compact can become effective.

This separation between state authority and federal authority is important. US states that adopt RUC cannot directly leverage US customs or immigration facilities to assess state RUC. They can, however, modify the activities of any state agents at or near those facilities (such as state agricultural inspectors) to collect additional information about incoming or outgoing visitors at international borders.



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Often one of the primary aims of multistate compacts is to create a legally empowered agency to administer the agreement for the benefit of all members collectively. This purpose is probably of greater interest when the number of states participating in a RUC system grows large.

The process for approval of multistate compacts is identical for bi-state compacts: Congressional consent is required if the compact in any way diminishes federal authority or power; and state legislative approval is required for all interstate compacts, with or without the Congressional consent requirement.

3.5. Distance-based charges

Distance-based charges can take several forms for international visitors.

3.5.1. Mileage Permit

Visitors entering the US from Canada and Mexico could be required to purchase a mileage permit – a block of miles they can consume on US roadways. In this case, RUC would be pre-paid directly to a host jurisdiction, with no financial reconciliation.

Enforcement of such a system would be challenging. In order to determine whether a permit is valid at any given time, there must be a record of the vehicles' odometer reading at the time it enters the US. There is also the question of whether a visitor must purchase a separate permit for each state it visits, which only increases both the visitor's reporting burden and the states' data management and enforcement burden. It is conceivable odometers could be read at entry and exit at state-run border inspection facilities at international points of entry, such as agricultural inspection points, but this added inspection burden could dramatically increase border wait times and RUC administration costs, and so is not likely to be palatable. Further, even if this proved feasible it does not address the problem of international visitors passing from one US state into another.

This options for assessing distance-based charges is likely to have very low compliance rates, particularly if the permitting system is seen by visitors as overly complex. Even when non-compliant visitors are caught and cited, collecting fines, penalties, and unpaid fees from another country may be quite difficult.

3.5.2. Location-aware automated reporting

A second option for distance-based RUC can be used by international visitors whose home state or province has a RUC program and who has installed a location-aware automated reporting system in their vehicle. If the home jurisdiction has entered into a RUC clearinghouse agreement with the US state(s) where the visitor travels, then mileage can be apportioned in a straightforward manner. This option has an advantage over the mileage permit in that RUC can be assessed for all miles driven by the home jurisdiction and distributed through a clearinghouse to the appropriate host jurisdiction(s). Evasion is still possible (simply not paying



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the RUC), but collections would occur in the evader's home jurisdiction. Still, this option is not without complications:

- (1) All jurisdictions where travel took place must participate in the clearinghouse for full reconciliation of tax funds to occur
- (2) there must be some agreement in place about how to handle currency conversions. For instance, does the clearinghouse use the prevailing exchange rate on the date travel took place, or the date reconciliation occurs? Or is an exchange rate set periodically (say, twice each year)?
- (3) For enforcement purposes, host states must have some way of identifying "reporting" vehicles without stopping the vehicle on the road. In effect, this means developing an international database of RUC-enrolled vehicles, and differentiating them by mileage measurement method. There would likely be significant privacy concerns associated with this.

3.6. Shadow Charge

More than any other RUC policy basis described in either Phase 1 or Phase 2 of this study, the shadow charge requires clear and detailed formal agreements between jurisdictions to describe the manner of calculating travel (and therefore RUC due) and the manner of reconciliation among jurisdictions. In an international context, at minimum an international MOU or multistate compact is necessary, with Congressional approval likely. The benefit of the shadow charge is that RUC is not collected on a location-specific basis; indeed, shadow charge scenarios can successfully include jurisdictions that do not charge any RUC at all. In this model, RUC for all miles driven is paid to the home jurisdiction, and the states or provinces reconcile funds due amongst themselves using an agreed-upon method of estimating visitor travel.

Numerous Canadian provinces and US states have been party to both International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) for several decades, so there is precedent for using a clearinghouse model for funds reconciliation. However, IFTA relies on detailed reporting by truck drivers to determine the distance driven in each jurisdiction, along with fuel tax paid. Such reporting would not be required by drivers under a passenger vehicle shadow charge. So, then, additional agreements would be required to detail how the shadow charge is assessed. And, as with distance charges, an agreement for handling currency conversions must be in place.

International agreements with Mexico have proven difficult to implement and sustain. For example, IFTA and IRP do not include Mexico, and neither has near- or medium-term plans to include Mexico. Likewise, programs to allow Mexican trucks to circulate in limited volumes in limited areas within the U.S. have likewise been controversial and slow to develop, and there are currently no cross-border interoperable tolling schemes. Given this background and other



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border issues, it is highly uncertain whether interoperable RUC based on a shadow charge with Mexico could be realistically achieved in the near future.

3.7. Distance-based and fuel-based, with or without shadow charges.

In the near term, adopting a combination of distance-based and fuel-based user fees is likely to be the most straightforward option for charging international visitors for their use of US roadways. Visitors that cross the border and purchase fuel will pay the motor fuel tax. If they are already participants of a RUC program that (1) uses location-aware technology and (2) has an agreement with US states to reconcile RUC, they can have the fuel tax credited against any RUC due. If they do not pay a RUC, they will not be eligible for the fuel tax rebate.

This option not only captures revenue via a user fee proxy (albeit an increasingly poor proxy), it provides an environment that allows time for international agreements and revenue reconciliation systems to be developed while still generating revenues for host jurisdictions. Some interjurisdictional revenue reconciliation is necessary to account for those visitors with location-aware RUC reporting systems, but retaining the motor fuel tax means that all others pay their user fee directly to the host jurisdiction.

Once concern with this option is that motorists could choose to fuel in their home country and then drive in US states. However, fuel prices along the US/Mexico border tend to be similar, while those in Canada are significantly higher than in the US. This being the case, there is little incentive for people to show preference to their home jurisdictions. And, for long-distance travel, it is very likely visitors will have to refuel in at least one host jurisdiction.

3.8. Special Considerations for an Operational International RUC Program

Any large-scale international RUC scheme is very likely to require the US to enter into either international compacts or treaties with Canada and Mexico. Looking ahead to potential policy and design decisions that must be made in order to implement an effective RUC system where international motorists are required to pay their fair share for use of US roadways, the following parameters are suggested:

- ▶ **There should be no discriminatory intent or design in collecting RUCs from international drivers.** For example, any charge must be levied for in-state, out-of-state, and international motorists traveling a jurisdiction's roadways. There should not be a special tax or fee that is applied only to international motorists ("tax exportation"). *An open question that requires additional legal research is the extent to which local tax preferences or similar accommodations are allowable.* In some instances, discounts for certain toll payers has been upheld, while in other cases exemptions for state residents have been found to be discriminatory. In Europe, the EU recently filed suit against Germany for allowing German residents to claim local fees paid against the national road usage charge, effectively lowering the rate for German residents compared to other road users.



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- ▶ A RUC should reflect a fair approximation of the use of the facilities.
- ▶ The amount of a RUC should not be excessive in relation to the benefits conferred.
- ▶ Methods of reporting and fee collection should not unduly burden international drivers.
- ▶ Standards for precision and accuracy of mileage measurement methods should be agreed.

In addition, there will need to be agreement on any regulations or specifications related to mileage measurement devices. How precise must they be, which types of devices are valid for measuring mileage, etc.

3.8.1. Regulations related to mileage measurement

Based on experiences in previous RUC pilots, vehicle owners seem most familiar and comfortable with the mileage totals displayed on their odometer. In other per-mile fee tests, participants have questioned the accuracy of the automated mileage metering devices, including those with GPS-enabled mapping for mileage calculation, because the GPS calculated mileage doesn't always match what is displayed on the vehicle's odometer. These discrepancies, no matter how small, may raise questions in the minds of the public about whether they are being "overcharged" for miles driven. There appears to be a built-in bias that the public is more likely to believe and accept the mileage shown on their odometers as most accurate than they are the mileage recorded by a new, unfamiliar device.

3.8.2. Global Positioning System (GPS) and Accuracy Standards

The regulation, standards and accuracy of the Global Positioning System (GPS) itself is within the domain of the U.S. federal government. The U.S. Department of Defense originally developed the GPS system in the 1970's to aid in military navigation. Although the system is maintained by the U.S., it is freely accessible to anyone with a GPS receiver.

The GPS system's accuracy for civilian uses (including mapping applications) is governed by the GPS Standard Positioning Service (SPS) Performance Standard, which is set by the Department of Defense. The current standard specifies that the lowest level of accuracy ("worst case" accuracy) is 7.8 meters at a 95% confidence level. Even higher levels of accuracy can be achieved when GPS is used in combination with other systems, enabling real-time positioning to within a few centimeters¹⁰. The accuracy of the GPS system itself is undisputed, certainly for purposes of measuring vehicle distances traveled on public roadways. In fact, GPS devices have been certified as revenue-grade use for measuring distances for truck fees in Oregon, and

¹⁰ See *Augmentation Systems*, internet based article provided by GPS.gov. Accessed June 27, 2016 at <http://www.gps.gov/systems/augmentations/>



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similar systems have been certified for revenue calculation purposes in New Zealand, Germany, and elsewhere.

The actual accuracy that users attain as measured on their GPS-enabled receivers, such as vehicle navigation devices, smart phones, etc., depends on factors outside of the GPS itself. Atmospheric effects, sky blockage (such as from tall trees or buildings), and quality of the receiver unit itself (in particular, the size, quality and location of the antenna) can affect accuracy. However, analysis conducted by the FAA shows that high-quality GPS receivers generally provide accuracy better than 3.5 meters.

A key difference between GPS mileage recording versus odometer mileage recording: to the extent there are minor discrepancies in actual versus recorded movement, with GPS those differences are only momentary, until the next signal plots the location along the roadway map. In this manner, any minor misreadings (for example, showing a vehicle traveling off the public roadway) are only momentary, until the next signal is received. By contrast, with odometer readings, very small variations in mileage are cumulative; if an odometer records very slightly more miles than actually traveled, these minor miscalculations are cumulative, continually recorded in the odometer reading, without the ability for correction. Such errors cause typical vehicle odometers to have inaccuracies ranging approximately +/- 2.5% or more; industry-developed targets for odometer accuracy are set at 4% margin of error.

3.9. Conclusions

International multijurisdictional RUC has similar challenges to multi-state RUC. These include:

- ▶ Being able to identify whether a “visiting” vehicle is registered for a valid RUC method in the host jurisdiction.
- ▶ Enforcing RUC on visitors
- ▶ Developing multi-jurisdiction frameworks for revenue collection and distribution

In addition, international RUC reconciliation requires agreement about how to manage currency conversion.

While RUC remains a state-level tax, states are unlikely to be able to leverage federal facilities at land ports of entry to collect data such as license plate numbers or odometer readings of RUC vehicles. Those states that maintain their own international border presence, such as agricultural inspection stations, could expand the functions of those facilities, but at a cost that is very likely to be prohibitive and have a negative impact on border wait times.

In the near term, for international visitors it seems the most cost effective and enforceable RUC policy is a combination of fuel-based and distance-based user fees. This scenario allows jurisdictions time to develop international partnerships and a robust financial clearinghouse model, and will be able to shift, over time, away from fuel-based fees to distance-based fees as the number of RUC states and provinces grows.



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Chapter 4: Developing a Successful Interjurisdictional RUC Pilot

4.1. Objectives of this chapter

The primary objectives of this chapter are the following:

- ▶ Identify characteristics of a successful regional, interjurisdictional RUC pilot related to interoperable travel reporting, RUC collection, and reconciliation across state boundaries
- ▶ Distinguish core activities of a regional interoperability test from activities common across individual state RUC pilots.
- ▶ Discuss steps for planning and executing an interjurisdictional RUC pilot

4.2. Organization

This chapter begins with a brief review of key points from Phase 1 of this study. Next, it discusses the characteristics a successful interjurisdictional RUC pilot is likely to have. Then it proposes at a high level three different approaches to configuring a multi-state demonstration, each designed to support distinct pilot objectives, followed by key issues to consider for international participation in a multi-jurisdiction pilot. Finally, the chapter lays out a path to a pilot.

4.3. Review of Relevant Discussion from Phase 1

Reconciliation methods and policy bases described in Phase 1 of this study are important background to many of the decisions described later in this chapter. That report is located at [URL] reference.

4.3.1. Recap of Policy Bases Developed in Phase 1

The eight policy bases developed in Phase 1 are summarized in Appendix A. Each of these has different implications for an interjurisdictional pilot. All but the “no charge” option can be tested in an interjurisdictional pilot, but the choice must be harmonized with participating states’ own policy goals. Another point to consider is that more than one of these policy bases can be tested in a single pilot; each state may adopt the basis that best supports its internal goals. Any arrangement with shadow charges requires consensus among participating states, but all other bases can be adopted by a state unilaterally (although not imposed on other states).

4.4. Motivating Factors and Success Factors for an Interjurisdictional RUC Pilot

This section describes motivating factors and characteristics a regional, interoperability pilot should have to give it the best possible chance for success.

There are three primary motivating factors for undertaking a regional or multi-state pilot that set it apart from pilots already conducted or planned by individual states:



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- ▶ The first reason is to assess the feasibility and performance of interoperable RUC reporting, payment, and reconciliation methods for charges assessed on miles driven across jurisdictional boundaries, from the perspective of motorists and participating agencies. This has not been fully evaluated in any U.S. pilot to date. States are free to adopt a unilateral approach to charging out-of-state drivers (e.g., using time permits in which visitors pay RUC directly to the host state). However, in a mature RUC system where automated mileage reporting methods with location-aware devices are widespread, it is quite probable that a motorist will remit their full RUC to either their account manager or home state, regardless of where miles were driven. In this future, it will be necessary for jurisdictions to reconcile RUC collected among themselves.
- ▶ The second reason is to develop the governance model, standards (for products and services that are used across borders), procurement, and other operational issues of common or shared RUC systems versus individual state RUC systems. WRUCC has already begun some of this work through development of its charter and bylaws, launch of a communications task force, and initial design of a certification framework. However, these activities could be extended and enhanced as part of a multi-state pilot complementary to the participant-facing activities of an interoperable RUC pilot.
- ▶ A third potential reason to test interjurisdictional RUC is economies of scale. States can share developmental costs and reduce their marginal costs of participation in a pilot. However, this reason is secondary to the core reasons mentioned above (to offer a metaphor, a Baskin-Robbins Groupon is of little use if you are lactose intolerant). Moreover, meaningful economies of scale for RUC operations do not materialize until participation reaches the hundreds of thousands, well beyond the scope of most RUC pilots.¹¹ It is doubtful that even a large multi-state pilot would have enough volunteers to see evidence of economies of scale, and as such conducting a pilot to assess costs is not an effective use of limited pilot opportunities available to states.

Other goals, such as increasing public awareness of RUC, testing RUC technology and operations, and building in-state institutional RUC capabilities, can be part of a multistate pilot, but these goals do not differentiate a multi-state effort from those already conducted by individual states.

The next section enumerates fundamental characteristics necessary for successful pilot testing interoperability of RUC.

¹¹ Although empirical data from U.S. RUC pilots are lacking, experience from light-vehicle RUC in New Zealand, weight-mile tax schemes in the U.S. and Europe, and IFTA suggest that the cost of collecting and reconciling RUC in a multi-jurisdictional environment can be competitive with fuel taxes at very large volumes



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4.5. Success Factors for an Interjurisdictional RUC Pilot

4.5.1. Ability to identify shared policy questions across participating states and funding agencies

The first key to success is to begin the process of designing an interjurisdictional pilot by articulating policy questions. Policy aims should be clearly established by legislative policy or a committee of stakeholders who provide legitimacy before any detailed pilot design or concept of operations is undertaken. Without policy-level questions and guidance, pilots are unlikely to produce information of value to decision makers. Moreover, if the goals for an interjurisdictional pilot conflict with the internal policy goals of participating states, the resulting tension could compromise the success of the pilot or set back a state's efforts for many years. For instance, if a state has adopted a policy stance stating that all RUC will be assessed using manual methods such as odometer readings, that state may not be a good fit for a multi-state pilot testing the ability of account managers to direct revenue to the correct jurisdiction using location-based operational concepts.

Clearly, not all states will have total alignment of RUC policy goals. However, a pilot can emerge from the policy questions that are held in common. Among WRUCC states actively studying RUC, the policy question of how to address visitors has arisen in Washington and Oregon, to a lesser extent in California, and hardly at all in Hawaii.

4.5.2. Ability to clearly translate policy objectives into pilot objectives shared by all participants

Common policy questions and objectives should drive pilot objectives, and the objectives should be driven by the questions the participating states wish to answer, along with activities that will further the goals of WRUCC over the mid- to long-term. Examples of objectives for an interjurisdictional pilot include the following:

- ▶ Work across state borders to highlight key issues not already resolved in single-state pilots, such as:
 - > Interoperability of RUC collection methods across state boundaries, including improved functionality (reliability and ease of use) of multijurisdictional operational concepts such as automated mileage reporting with location-aware technologies and public acceptance of such options
 - > Reconciliation of funds among jurisdictions, including assessment of feasibility of different methods of financial clearing or reconciliation and development of business rules that govern the exchange of funds
 - > Establishing standards for common technology or operational elements, possibly to support shared procurement or certification of account managers.
 - > Test the application of common specifications and standards for hardware, software, and account management in an operational environment
 - > Test the flexibility of pre-existing “open” platforms and their ability to address local design preferences



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- > Test the use and functionality of interoperable RUC in the presence of varied jurisdictional rate structures
- > Test application of RUC to various population segments across participating jurisdiction at once
- ▶ Amplify issues already being address in single-state pilots such as:
 - > Jointly conduct outreach with key stakeholders and policy makers to raise awareness about the need to study and test RUC
 - > Increase public awareness of the challenges that surround declining gas tax revenues
 - > Clearly position the gas tax as a user fee for road funding

Clearly, no single pilot can have all these objectives, and WRUCC may decide to adopt a different set of pilot objectives. However, those listed above are examples of objectives that can be evaluated.

4.5.3. Ability to define pilot scope that address policy questions and meets pilot objectives

Once policy questions have been identified and pilot objectives articulated, it is critical to resolve issues surrounding what to include and what to leave out of the pilot, as an early step the design process. The number of states to involve, the ability of states to enter over time, number of pilot participants to include, number and description of operational concepts and technologies to offer, description of interoperability features across various mixes of operational concepts (including fuel taxes), types of account management services to offer, types of public engagement activities to feature, length of the pilot, and type of reconciliation method (including business rules) to test should be decided, based on the policy objectives and questions that the pilot aims to address.

To the extent possible, attention should be paid to selecting an optimal combination of the policy bases and operational concepts developed in Phase 1 of this study on interjurisdictional RUC issues and to ensuring that test design and implementation options are developed that work for each individual state as well as the collective.

4.5.4. Ability to define organizational structure with clearly defined roles and responsibilities

The structure of an interjurisdictional pilot is heavily dependent on the overall scope, objectives, participating states, and technical, operational and administrative parameters for the project. It should be recognized that each participating state may have different organizational structures in place to report and reconcile RUC. In fact, many states may have different organizations or specially-designed organizational structures in place. As such, a multi-state or regional pilot may have a suite of organizations that may need to collaborate in agreeing to a set of defined roles and responsibilities as well as the business rules that govern them.



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- ▶ **Stakeholders.** As part of the pilot design process, participating jurisdictions should identify possible participants, stakeholders, and other interested parties and determine whether or not their interests can or should be incorporated in the pilot. To the extent stakeholders are included in the pilot, their role should be made clear early in the planning process (advisory, observational, etc.).
- ▶ **Administrative parameters.** A multi-state, interjurisdictional pilot is bound to be a complex undertaking. Each participating state is likely to have different procurement rules, budgetary processes, relationships with stakeholders, and groupings of agencies involved with assessing, collecting, and distributing RUC. As such, it is critical that the pilot project have a well-defined organizational structure. The importance of establishing and formalizing this structure is discussed in Section 6.2.

4.6. Interjurisdictional Pilot Configuration

There are several different forms a multistate RUC pilot might take. The examples provided in this section are not exhaustive. WRUCC may identify and desire to pursue something altogether different, but this list provides a starting framework for configuring a pilot that incorporates several states:

1. Extend current RUC systems and pilots to additional states
2. Extend the specification of the current “open architecture” used by some WRUCC states to develop a pilot that uses commercial account managers to manage revenue reconciliation activities
3. Layer the collection of federal motor fuel tax to test reconciliation models that correctly allocate state and federal taxes to the correct jurisdiction, based on federal funding allocation formulas for the federal portion of the taxes collected.

4.6.1. Extension of current state-level RUC systems and pilots

Among the RUC-West states, Oregon currently has an operational RUC program, and California is undertaking a pilot. Other states are addressing possible pilot tests. Thus far, Oregon and California have adopted open system architectures for their RUC systems, and Washington’s RUC Steering Committee has endorsed the concept, to encourage continuous innovation in mileage reporting technologies. Extending this open system architecture to additional states provides opportunities for:

- ▶ Additional public engagement and outreach to increase public awareness of declining gas tax revenues
- ▶ Testing a variety of methods of assessing RUC on out-of-state drivers, including time permits and shadow charges



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- ▶ Testing any of the three methods of reconciling RUC fees collected among the participating states
- ▶ Demonstrating to participating states the freedom of selecting RUC measurement and reporting methods that best support the state's policy objectives and political climate

4.6.2. Create an account manager-based reconciliation system

Another option for an interjurisdictional pilot is for a group of jurisdictions (cities, states, provinces, etc.) to adopt a common specification that allows the jurisdiction(s) to enter into an arrangement with one or more commercial account managers to provide the full range of RUC account services, including mileage measurement, reporting, invoicing, transaction processing, funds transfers, and distribution of RUC to the relevant jurisdiction(s). Under this model, account managers calculate the RUC due to each state and remit the funds directly to the states on a periodic basis. This option provides opportunities for:

- ▶ Additional public engagement and outreach to increase public awareness of declining gas tax revenues,
- ▶ Use of independent and third-party vendors to collect fees, operate the system, and reconcile revenues,
- ▶ Ability of audit functions to effectively monitor the revenue reconciliation process,
- ▶ Testing the feasibility of assessing shadow charges on motorists that do not choose a location-based mileage reporting method

4.6.3. Integration with federal gas tax

A third path to a pilot is for a group of states to band together to investigate the feasibility of states collecting, reconciling, and redistributing a federal RUC in addition to the state's road charge. Under the current model, federal taxes are assessed "at the rack" – upon removal from bulk storage terminals – and paid to the Internal Revenue Service (IRS). The revenue is deposited into the Highway Trust Fund. Most (83-87%) of the revenue is deposited into the Highway Account for redistribution back to states for road construction and maintenance. Under this pilot configuration, states could test the feasibility of collecting a "federal RUC" in addition to the state charge and redistributing it to participating state accounts using existing federal apportionment formulas, but without sending it to the IRS. States would still be subject to federal program approval to spend the funds, and would still be subject to audit by the IRS, but such a model, if it proves feasible, could eliminate much of the federal cost of collection and redistribution. Under this model, a block chain accounting model is likely to be most efficient. This option provides opportunities for:

- ▶ Additional public engagement and outreach to increase public awareness of declining gas tax revenues,
- ▶ Testing methods of streamlining the federal gas tax collection/dispersal process under a RUC
- ▶ Determining the feasibility of block-chain accounting for multi-jurisdictional RUC



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4.6.4. Considerations for an International Demonstration Project

Expansion of a regional pilot to include jurisdictions in either Canada or Mexico requires special consideration. While some metropolitan areas in Washington, California, Arizona, and Texas see significant amounts of daily cross-border passenger vehicle traffic, in most areas the amount of passenger traffic generated by vehicles originating outside the U.S. is quite small. The potential revenue to be gained by assessing RUC on these vehicles should be balanced against the challenges of the following:

- ▶ Informing international visitors of RUC rules and requirements
- ▶ Gaining compliance with each state's RUC
- ▶ Enforcing RUC across international borders

A detailed analysis of the costs and revenues associated with levying RUC on international visitors is presented in Chapter 3.

4.7. Steps for Developing an Interjurisdictional RUC Pilot

The sections above describe considerations and possible starting points for an interjurisdictional pilot. This section walks through the concrete steps WRUCC states can follow to develop an interjurisdictional RUC pilot. While these “steps” are listed sequentially, in reality some may be addressed concurrently.

4.7.1. Ascertain State Interest in and Readiness for Participating in a Pilot

Given that the states comprising WRUCC are all at different stages of RUC policy development and operational readiness, not all may be willing or able to participate in a multi-state pilot. In the context of developing a pilot, the concept of “interest” includes political openness to state participation, likely availability of funding, and willingness to allocate knowledgeable staff to participate in pilot project development and management. “Readiness” suggests that the state has formulated a basic policy objective for RUC (typically it is to create a sustainable transportation revenue source) and can articulate specific objectives for a pilot. It is not necessary for a state that wishes to participate to have already undertaken its own RUC pilot, but it is critical to have some direction, even if just questions, from engaged policy makers.

4.7.2. Formalize an Organizational Structure to Oversee Pilot Planning and Development

The planning and development of a pilot project requires significant organization and dedication of resources. One strategy the WRUCC can adopt is to create a committee charged with leading pilot planning and development efforts. Members of the committee would be charged with overseeing pilot development, keeping the WRUCC Board of Directors informed of pilot progress, and serving as liaisons between various agencies within their states (DOTs, Commissions, DMVs, etc.) and WRUCC. An alternate strategy is for WRUCC, or a WRUCC pilot management committee, to hire a project manager specifically for the project, who would



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be charged with updating the WRUCC membership and Board and managing the relationships with vendors and state agencies.

Regardless of the model WRUCC chooses for overseeing pilot planning and development, there are several key questions that must be answered at this point:

- ▶ Who leads the discussions and the project? A key element of any collection of states or organizations requires a single point of management or focus to harmonize the efforts and manage the group to a consensus. As discussed above, the project could be managed by a WRUCC committee, a project manager hired by WRUCC specifically for this project, or an employee of one of the participating DOTs.
- ▶ Which state manages or administers the project and ensures that any state or federal reporting requirements are met? Is this the responsibility of the WRUCC Administrator or another state to take the lead?
- ▶ Who contracts necessary services? Will each state enter into separate contracts for services to be provided in that state, or will WRUCC contract vendors for the project as a whole? Do the participating states have the ability to enter into a compact or contractual agreement with one another to facilitate procurement activities?
- ▶ Is the contracting entity the same entity that serves as the project's primary point of contact with contractors?
- ▶ How are agreements between states executed and documented? Who has the authority to enter into such agreements? It is very likely that the need to pool funds or share procurements will require some formal agreements between states. These can take several forms, including Memorandums of Understanding, contracts, and Letters of Commitment.

4.7.3. Establish pilot goals and objectives

Regardless of the funding source, pilot goals and objectives should be established that respect the context and policy objectives of the funding agencies, and deliver value to longer-term RUC development. That said, chances of securing funding increase if WRUCC is able to identify objectives that align with those of funding entities.

A number of possible objectives are listed in Section 3.3 above. As a starting point for narrowing that list or developing new pilot goals and objectives, the following questions may be helpful:

- ▶ What still-untested element(s) of RUC can be demonstrated and evaluated that will generate the most useful results for WRUCC?
- ▶ What still-untested element(s) of RUC can be demonstrated and evaluated that will generate the most useful results for funding agencies (state legislatures, FHWA, USDOT, Congress, etc.)?
- ▶ What are the key policy objectives of participating WRUCC states? What is the key policy objective of WRUCC as a collective?



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- ▶ How do WRUCC's policy objectives align with those of the funding agencies? How can a regional pilot further those objectives?

4.7.4. Define project scope

Once the pilot's goals and objectives are defined, the next step is to create an initial definition of the project scope. The scope may be revised based on feedback from stakeholders, participating agencies outside WRUCC (for instance, a participating state's DMV or equivalent), and funding entities. However, a clear scope definition is necessary before the next steps can occur.

The scope should contain a list of all activities necessary to deliver on a regional pilot, including design and initiation activities as well as volunteer recruitment, vendor procurement, communications and media activities, pilot operations, and evaluation of outcomes.

4.7.5. Identify key issues and risks

As the pilot's scope takes shape and objectives are established, it is a good practice to begin to identify issues that the states are likely to encounter during the pilot lifecycle (planning, developing, implementing, operating, and evaluating) and develop initial mitigation measures. Issues and risks may be administrative (for example, different procurement rules in participating states make it difficult to procure required services, state treasury rules prohibit use of a clearing house for revenue reconciliation), operational (state IT rules may make it difficult to connect to a 3rd party clearinghouse), budgetary (limitations on the use of funds allocated to a state DOT might make it difficult for a group of states to meet funding match requirements), or schedule-related (a state that wishes to participate cannot guarantee funding until its legislature meets in 2017). Early identification of possible issues and risks may impact the pilot project's ultimate scope – it may be that the most effective mitigation measure for some issues is to adjust the project scope to avoid the issue entirely.

Risk identification and management are activities that should be conducted throughout the pilot project.

4.7.6. Develop cost estimates for an interjurisdictional pilot

Once the project scope is defined, the next step is to develop a high-level cost estimate for the pilot, and indicate each participating state's share of the costs. All elements of the project should be included in this estimate, including any costs associated with project management, public engagement, recruiting, vendor procurement, evaluation, financial reconciliation, and stakeholder management. These cost estimates will be important when seeking funding for the project.

4.7.7. Identify funding sources

Funding is obviously a critical element of any pilot, and sources of funding must be identified early in the pilot development process. RUC pilots in the U.S. have been funded through direct



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state legislative appropriation, under research programs funded by USDOT, or some combination of the two. In Fixing America's Surface Transportation (FAST) Act (Pub.L. No. 114-94), Congress made available \$95 million to provide grants to states to demonstrate user-based alternative revenue mechanisms that utilize a user-fee structure. This grant program requires a fifty-percent, non-federal match from participating states, and so in most cases will require an appropriation from state legislatures or state generated soft match contributions.

While funding is typically not actively sought until after a general project scope is defined, understanding the objectives of the various funding entities will aid in aligning the pilot's goals with those of the funding sources, thereby increasing the likelihood of the pilot being funded.

4.7.8. Create and Implement an Action Plan to Deliver an Interjurisdictional Pilot

Finally, the organization (WRUCC subcommittee) or project manager overseeing pilot planning and development should create and implement an action plan to deliver the pilot. It should also determine which activities in the action plan should be conducted by state staff versus consultant staff. Elements of this action plan include but are not limited to:

- ▶ Request funding from state legislatures
- ▶ Seek any necessary legislative authorization to conduct the pilot
- ▶ Seek any available federal funding
- ▶ Procure any required support to finalize project planning and begin pilot delivery, including but not limited to:
 - > Creation of communications plans
 - > Creation of participant recruitment plans
 - > Stakeholder management
 - > Creation of any necessary technical documents, including Concept of Operations and system specifications
 - > Support for vendor procurement (commercial account managers, technology providers, and revenue reconciliation services)
- ▶ Establish pilot evaluation criteria
- ▶ Procure required vendors
- ▶ Recruit pilot participants
- ▶ Risk analysis to identify impediments to implementation and potential issues and mitigation measures in the overall approach

4.8. Summary

This chapter outlines key steps to consider in planning an interjurisdictional RUC demonstration, and suggests objectives for such a pilot. It also suggests three starting points for pilot planning and development (extend the Oregon and California system, test a multi-state system based on



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common specifications, and test a system that reconciles both federal and state RUC using block chain ledgers), and describes the characteristics of a successful interjurisdictional pilot.



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Chapter 5: Summary and Conclusions

This report extends the work undertaken in Phase 1 of “Assessing Out-of-State Drivers in A Road Charge Usage System” by estimating possible revenue impacts of charging or not charging RUC on visitors to a state with a RUC system under three different RUC policy bases: distance-based charge, shadow charge, and combination distance-based/fuel-based charging. The estimates of revenue implications included costs associated with assessing and enforcing RUC on visitors, as well as costs associated with participating in a revenue reconciliation clearinghouse. In a situation where all jurisdictions charge a RUC and all jurisdictions continue to assess a motor fuel tax at the pump, a combination distance-based/fuel-based charge is the least costly in the short-term. However, as the proportion of plug-in electric vehicles increases over time, the effectiveness of the fuel-tax as a user fee for visitors will decline. In the longer term, shadow charges are likely to be more efficient to collect than attempting to identify all visitors and enforce RUC payment, but there is a significant amount of work to do to develop models of visitor travel to support such as system.

This report also identified special considerations related to assessing RUC on international visitors, with special attention to legal and regulatory issues and a discussion of the types of agreements that may be used to establish international RUC relationships with jurisdictions outside the U.S.

Finally, the report lays out considerations for developing a successful interjurisdictional RUC pilot, including considerations for an international demonstration.



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Appendix A. Recap of Policy Bases Developed in Phase 1

The eight policy bases developed in Phase 1 are summarized in Table 6. Each of these has different implications for an interjurisdictional pilot. All but the “no charge” option can be tested in an interjurisdictional pilot, but the choice must be harmonized with participating states’ own policy goals. Another point to consider is that more than one of these policy bases can be tested in a single pilot; each state may adopt the basis that best supports its internal goals. Any arrangement with shadow charges requires consensus among participating states, but all other bases can be adopted by a state (although not imposed on other states) unilaterally.

Table 6. Summary of Policy Bases Developed in Phase 1

Policy Basis	Description of Policy Basis
1. No charge	The host jurisdiction does not charge visitors for road usage.
2. Shadow charge	The host jurisdiction does not charge visitors for road usage, but measures or estimates their usage as the basis for a reconciliation of funds collected by the visitor’s home jurisdiction. For example, this could apply for visitors with a manual (e.g., odometer-based) RUC reporting option in their home jurisdiction. It could also work in conjunction with a fuel-based charge.
3. Charge based on fuel consumption	The host jurisdiction imposes a tax on fuel purchased by visitors. The tax may or may not also apply to residents.
4. Charge based on time	The host jurisdiction imposes a charge on visitors based on the amount of time they access the host roadway network.
5. Charge based on distance	The host jurisdiction imposes a charge on visitors based on the distance they travel on the host roadway network.
6. Distance-based, with shadow charges	The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets), but uses shadow charging for vehicles that opted for manual or non-location-based distance reporting in their home jurisdictions.
7. Distance-based and fuel-based, with or without shadow charges	The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets), but uses fuel taxes for all other visitors.



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8. Distance-based and time-based	The host jurisdiction imposes a distance-based charge on vehicles equipped with electronic distance- and location-reporting capabilities (including fuel tax offsets) and time-based charging for all other visitors.
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Appendix B. The Great Chain of Being Sure About Things

Source: The Economist.com,

<http://www.economist.com/news/briefing/21677228-technology-behind-bitcoin-lets-people-who-do-not-know-or-trust-each-other-build-dependable>

Blockchains

The great chain of being sure about things

The technology behind bitcoin lets people who do not know or trust each other build a dependable ledger. This has implications far beyond the cryptocurrency

Oct 31st 2015



WHEN the Honduran police came to evict her in 2009 Mariana Catalina Izaguirre had lived in her lowly house for three decades. Unlike many of her neighbours in Tegucigalpa, the country's capital, she even had an official title to the land on which it stood. But the records at the country's Property Institute showed another person registered as its owner, too—and that person convinced a judge to sign an eviction order. By the time the legal confusion was finally sorted out, Ms Izaguirre's house had been demolished.

It is the sort of thing that happens every day in places where land registries are badly kept, mismanaged and/or



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corrupt—which is to say across much of the world. This lack of secure property rights is an endemic source of insecurity and injustice. It also makes it harder to use a house or a piece of land as collateral, stymying investment and job creation.

Such problems seem worlds away from bitcoin, a currency based on clever cryptography which has a devoted following among mostly well-off, often anti-government and sometimes criminal geeks. But the cryptographic technology that underlies bitcoin, called the “blockchain”, has applications well beyond cash and currency. It offers a way for people who do not know or trust each other to create a record of who owns what that will compel the assent of everyone concerned. It is a way of making and preserving truths.

That is why politicians seeking to clean up the Property Institute in Honduras have asked Factom, an American startup, to provide a prototype of a blockchain-based land registry. Interest in the idea has also been expressed in Greece, which has no proper land registry and where only 7% of the territory is adequately mapped.

A place in the past

Other applications for blockchain and similar “distributed ledgers” range from thwarting diamond thieves to streamlining stockmarkets: the NASDAQ exchange will soon start using a blockchain-based system to record trades in privately held companies. The Bank of England, not known for technological flights of fancy, seems electrified: distributed ledgers, it concluded in a research note late last year, are a “significant innovation” that could have “far-reaching implications” in the financial industry.

The politically minded see the blockchain reaching further than that. When co-operatives and left-wingers gathered for this year’s OuiShare Fest in Paris to discuss ways that grass-roots organisations could undermine giant repositories of data like Facebook, the blockchain made it into almost every speech. Libertarians dream of a world where more and more state regulations are replaced with private contracts between individuals—contracts which blockchain-based programming would make self-enforcing.

The blockchain began life in the mind of Satoshi Nakamoto, the brilliant, pseudonymous and so far unidentified creator of bitcoin—a “purely peer-to-peer version of electronic cash”, as he put it in a paper published in 2008. To work as cash, bitcoin had to be able to change hands without being diverted into the wrong account and to be incapable of being spent twice by the same person. To fulfil Mr Nakamoto’s dream of a decentralised system the avoidance of such abuses had to be achieved without recourse to any trusted third party, such as the banks which stand behind conventional payment systems.

It is the blockchain that replaces this trusted third party. A database that contains the payment history of every bitcoin in circulation, the blockchain provides proof of who owns what at any given juncture. This distributed ledger is replicated on thousands of computers—bitcoin’s “nodes”—around the world and is publicly available. But for all its openness it is also trustworthy and secure. This is guaranteed by the mixture of mathematical subtlety and computational brute force built into its “consensus mechanism”—the process by which the nodes agree on how to update the blockchain in the light of bitcoin transfers from one person to another.

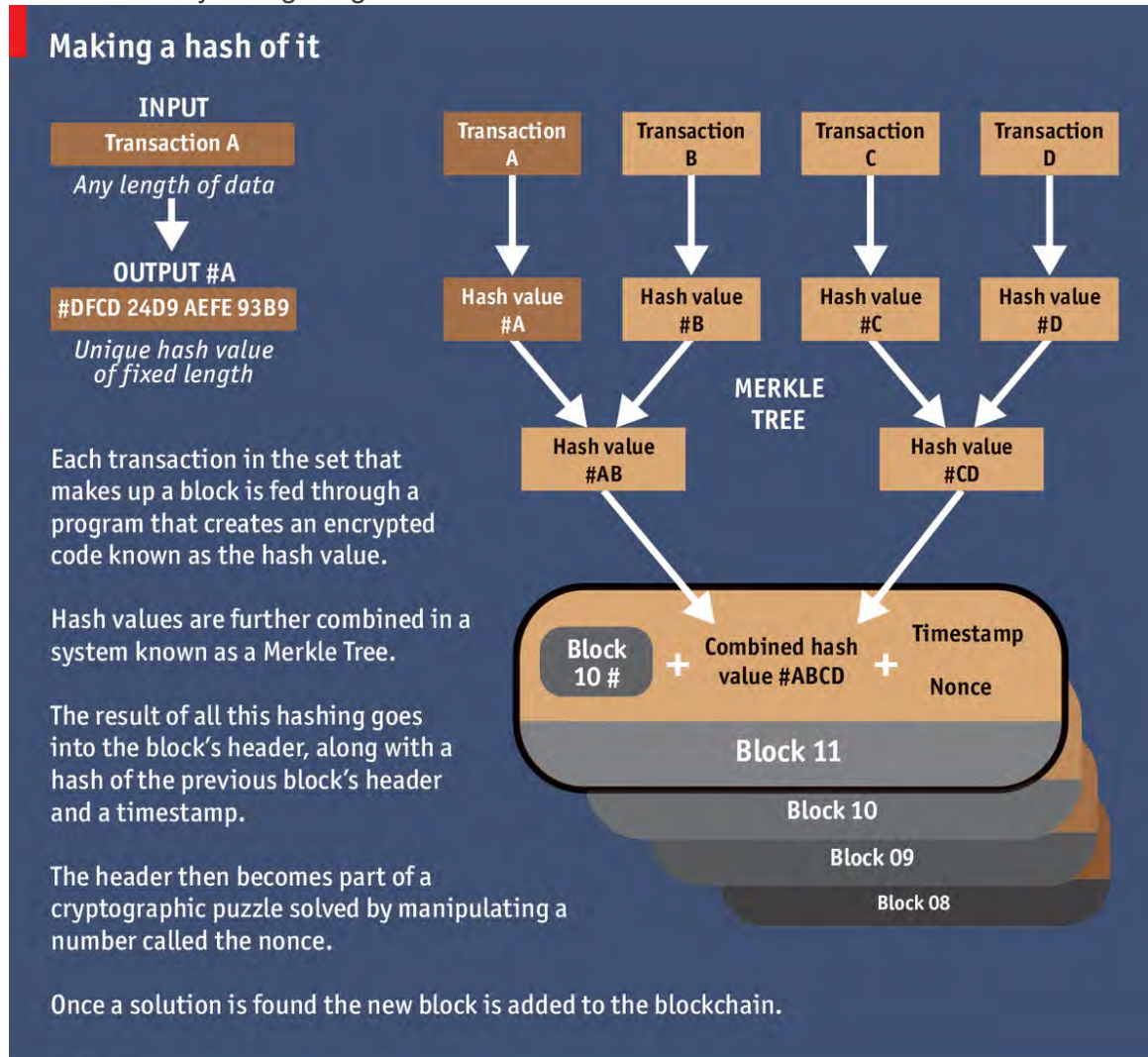
Let us say that Alice wants to pay Bob for services rendered. Both have bitcoin “wallets”—software which accesses the blockchain rather as a browser accesses the web, but does not identify the user to the system. The transaction starts with Alice’s wallet proposing that the blockchain be changed so as to show Alice’s wallet a little emptier and Bob’s a little fuller.

The network goes through a number of steps to confirm this change. As the proposal propagates over the network the various nodes check, by inspecting the ledger, whether Alice actually has the bitcoin she now wants to spend. If everything looks kosher, specialised nodes called miners will bundle Alice’s proposal with other similarly reputable transactions to create a new block for the blockchain.



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This entails repeatedly feeding the data through a cryptographic “hash” function which boils the block down into a string of digits of a given length (see diagram). Like a lot of cryptography, this hashing is a one-way street. It is easy to go from the data to their hash; impossible to go from the hash back to the data. But though the hash does not contain the data, it is still unique to them. Change what goes into the block in any way—alter a transaction by a single digit—and the hash would be different.



Economist.com

Running in the shadows

That hash is put, along with some other data, into the header of the proposed block. This header then becomes the basis for an exacting mathematical puzzle which involves using the hash function yet again. This puzzle can only be solved by trial and error. Across the network, miners grind through trillions and trillions of possibilities looking for the answer. When a miner finally comes up with a solution other nodes quickly check it (that's the one-way street again: solving is hard but checking is easy), and each node that confirms the solution updates the blockchain accordingly. The hash of the header becomes the new block's identifying string, and that block is now part of the ledger. Alice's payment to Bob, and all the other transactions the block contains, are confirmed.



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This puzzle stage introduces three things that add hugely to bitcoin's security. One is chance. You cannot predict which miner will solve a puzzle, and so you cannot predict who will get to update the blockchain at any given time, except in so far as it has to be one of the hard working miners, not some random interloper. This makes cheating hard.

The second addition is history. Each new header contains a hash of the previous block's header, which in turn contains a hash of the header before that, and so on and so on all the way back to the beginning. It is this concatenation that makes the blocks into a chain. Starting from all the data in the ledger it is trivial to reproduce the header for the latest block. Make a change anywhere, though—even back in one of the earliest blocks—and that changed block's header will come out different. This means that so will the next block's, and all the subsequent ones. The ledger will no longer match the latest block's identifier, and will be rejected.

Is there a way round this? Imagine that Alice changes her mind about paying Bob and tries to rewrite history so that her bitcoin stays in her wallet. If she were a competent miner she could solve the requisite puzzle and produce a new version of the blockchain. But in the time it took her to do so, the rest of the network would have lengthened the original blockchain. And nodes always work on the longest version of the blockchain there is. This rule stops the occasions when two miners find the solution almost simultaneously from causing anything more than a temporary fork in the chain. It also stops cheating. To force the system to accept her new version Alice would need to lengthen it faster than the rest of the system was lengthening the original. Short of controlling more than half the computers—known in the jargon as a “51% attack”—that should not be possible.

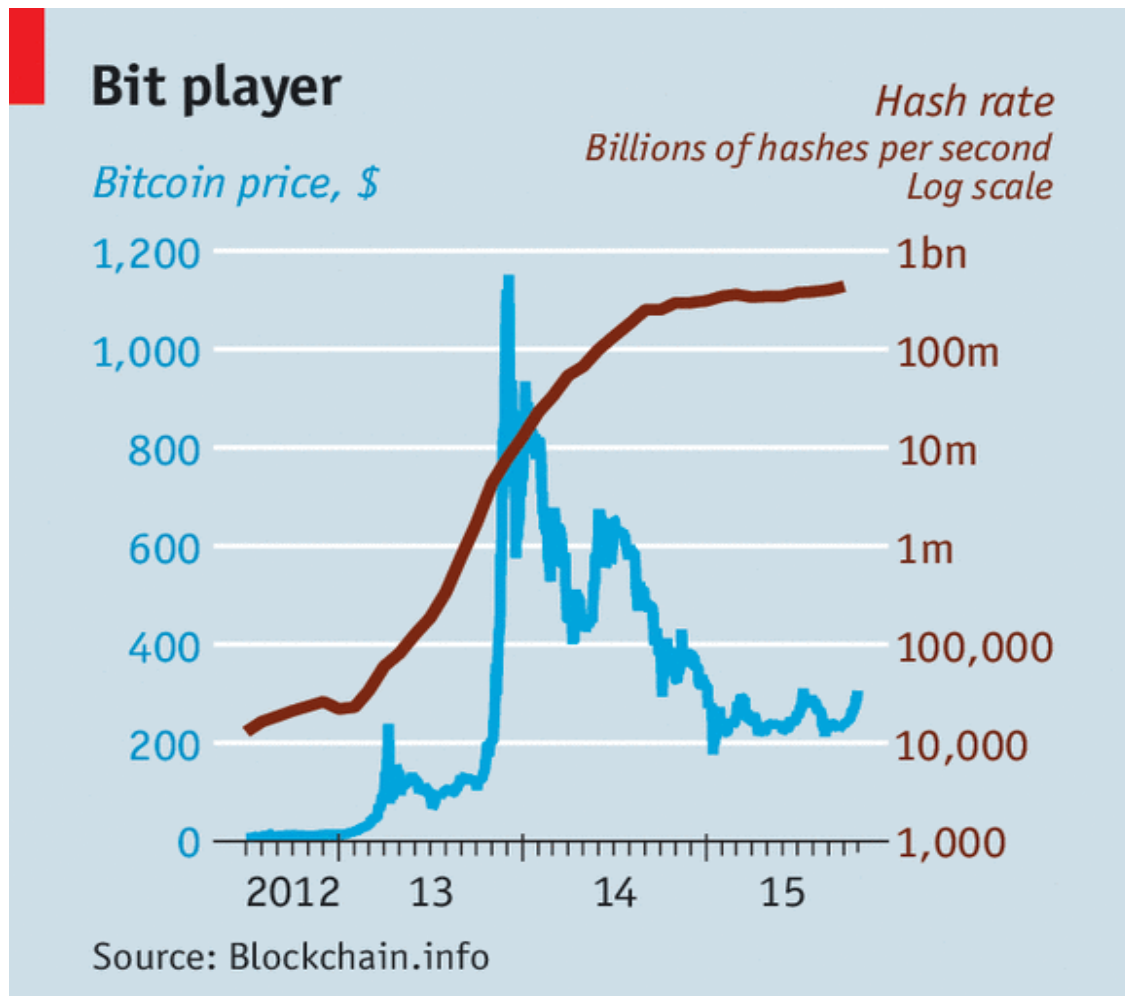
Dreams are sometimes catching

Leaving aside the difficulties of trying to subvert the network, there is a deeper question: why bother to be part of it at all? Because the third thing the puzzle-solving step adds is an incentive. Forging a new block creates new bitcoin. The winning miner earns 25 bitcoin, worth about \$7,500 at current prices.

All this cleverness does not, in itself, make bitcoin a particularly attractive currency. Its value is unstable and unpredictable (see chart), and the total amount in circulation is deliberately limited. But the blockchain mechanism works very well. According to blockchain.info, a website that tracks such things, on an average day more than 120,000 transactions are added to the blockchain, representing about \$75m exchanged. There are now 380,000 blocks; the ledger weighs in at nearly 45 gigabytes.



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Economist.com

Most of the data in the blockchain are about bitcoin. But they do not have to be. Mr Nakamoto has built what geeks call an “open platform”—a distributed system the workings of which are open to examination and elaboration. The paragon of such platforms is the internet itself; other examples include operating systems like Android or Windows. Applications that depend on basic features of the blockchain can thus be developed without asking anybody for permission or paying anyone for the privilege. “The internet finally has a public data base,” says Chris Dixon of Andreessen Horowitz, a venture-capital firm which has financed several bitcoin start-ups, including Coinbase, which provides wallets, and 21, which makes bitcoin-mining hardware for the masses.

For now blockchain-based offerings fall in three buckets. The first takes advantage of the fact that any type of asset can be transferred using the blockchain. One of the startups betting on this idea is Colu. It has developed a mechanism to “dye” very small bitcoin transactions (called “bitcoin dust”) by adding extra data to them so that they can represent bonds, shares or units of precious metals.

Protecting land titles is an example of the second bucket: applications that use the blockchain as a truth machine. Bitcoin transactions can be combined with snippets of additional information which then also become embedded in the ledger. It can thus be a registry of anything worth tracking closely. Everledger uses the blockchain to protect luxury goods; for example it will stick on to the blockchain data about a stone’s



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distinguishing attributes, providing unchallengeable proof of its identity should it be stolen. Onename stores personal information in a way that is meant to do away with the need for passwords; CoinSpark acts as a notary. Note, though, that for these applications, unlike for pure bitcoin transactions, a certain amount of trust is required; you have to believe the intermediary will store the data accurately.

It is the third bucket that contains the most ambitious applications: “smart contracts” that execute themselves automatically under the right circumstances. Bitcoin can be “programmed” so that it only becomes available under certain conditions. One use of this ability is to defer the payment miners get for solving a puzzle until 99 more blocks have been added—which provides another incentive to keep the blockchain in good shape. Lighthouse, a project started by Mike Hearn, one of bitcoin’s leading programmers, is a decentralised crowdfunding service that uses these principles. If enough money is pledged to a project it all goes through; if the target is never reached, none does. Mr Hearn says his scheme will both be cheaper than non-bitcoin competitors and also more independent, as governments will be unable to pull the plug on a project they don’t like.

Energy is contagious

The advent of distributed ledgers opens up an “entirely new quadrant of possibilities”, in the words of Albert Wenger of USV, a New York venture firm that has invested in startups such as OpenBazaar, a middleman-free peer-to-peer marketplace. But for all that the blockchain is open and exciting, sceptics argue that its security may yet be fallible and its procedures may not scale. What works for bitcoin and a few niche applications may be unable to support thousands of different services with millions of users.

Though Mr Nakamoto’s subtle design has so far proved impregnable, academic researchers have identified tactics that might allow a sneaky and well financed miner to compromise the block chain without direct control of 51% of it. And getting control of an appreciable fraction of the network’s resources looks less unlikely than it used to. Once the purview of hobbyists, bitcoin mining is now dominated by large “pools”, in which small miners share their efforts and rewards, and the operators of big data centres, many based in areas of China, such as Inner Mongolia, where electricity is cheap.

Another worry is the impact on the environment. With no other way to establish the bona fides of miners, the bitcoin architecture forces them to do a lot of hard computing; this “proof of work”, without which there can be no reward, insures that all concerned have skin in the game. But it adds up to a lot of otherwise pointless computing. According to blockchain.info the network’s miners are now trying 450 thousand trillion solutions per second. And every calculation takes energy.

Because miners keep details of their hardware secret, nobody really knows how much power the network consumes. If everyone were using the most efficient hardware, its annual electricity usage might be about two terawatt-hours—a bit more than the amount used by the 150,000 inhabitants of King’s County in California’s Central Valley. Make really pessimistic assumptions about the miners’ efficiency, though, and you can get the figure up to 40 terawatt-hours, almost two-thirds of what the 10m people in Los Angeles County get through. That surely overstates the problem; still, the more widely people use bitcoin, the worse the waste could get.

Yet for all this profligacy bitcoin remains limited. Because Mr Nakamoto decided to cap the size of a block at one megabyte, or about 1,400 transactions, it can handle only around seven transactions per second, compared to the 1,736 a second Visa handles in America. Blocks could be made bigger; but bigger blocks would take longer to propagate through the network, worsening the risks of forking.

Earlier platforms have surmounted similar problems. When millions went online after the invention of the web browser in the 1990s pundits predicted the internet would grind to a standstill: *eppur si muove*. Similarly, the bitcoin system is not standing still. Specialised mining computers can be very energy efficient, and less energy-hungry alternatives to the proof-of-work mechanism have been proposed. Developers are also working on an



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add-on called “Lightning” which would handle large numbers of smaller transactions outside the blockchain. Faster connections will let bigger blocks propagate as quickly as small ones used to.

The problem is not so much a lack of fixes. It is that the network’s “bitcoin improvement process” makes it hard to choose one. Change requires community-wide agreement, and these are not people to whom consensus comes easily. Consider the civil war being waged over the size of blocks. One camp frets that quickly increasing the block size will lead to further concentration in the mining industry and turn bitcoin into more of a conventional payment processor. The other side argues that the system could crash as early as next year if nothing is done, with transactions taking hours.

A break in the battle

Mr Hearn and Gavin Andresen, another bitcoin grandee, are leaders of the big-block camp. They have called on mining firms to install a new version of bitcoin which supports a much bigger block size. Some miners who do, though, appear to be suffering cyber-attacks. And in what seems a concerted effort to show the need for, or the dangers of, such an upgrade, the system is being driven to its limits by vast numbers of tiny transactions. This has all given new momentum to efforts to build an alternative to the bitcoin blockchain, one that might be optimised for the storing of distributed ledgers rather than for the running of a cryptocurrency. MultiChain, a build-your-own-blockchain platform offered by Coin Sciences, another startup, demonstrates what is possible. As well as offering the wherewithal to build a public blockchain like bitcoin’s, it can also be used to build private chains open only to vetted users. If all the users start off trusted the need for mining and proof-of-work is reduced or eliminated, and a currency attached to the ledger becomes an optional extra.

The first industry to adopt such sons of blockchain may well be the one whose failings originally inspired Mr Nakamoto: finance. In recent months there has been a rush of bankerly enthusiasm for private blockchains as a way of keeping tamper-proof ledgers. One of the reasons, irony of ironies, is that this technology born of anti-government libertarianism could make it easier for the banks to comply with regulatory requirements on knowing their customers and anti-money-laundering rules. But there is a deeper appeal.

Industrial historians point out that new powers often become available long before the processes that best use them are developed. When electric motors were first developed they were deployed like the big hulking steam engines that came before them. It took decades for manufacturers to see that lots of decentralised electric motors could reorganise every aspect of the way they made things. In its report on digital currencies, the Bank of England sees something similar afoot in the financial sector. Thanks to cheap computing financial firms have digitised their inner workings; but they have not yet changed their organisations to match. Payment systems are mostly still centralised: transfers are cleared through the central bank. When financial firms do business with each other, the hard work of synchronising their internal ledgers can take several days, which ties up capital and increases risk.

Distributed ledgers that settle transactions in minutes or seconds could go a long way to solving such problems and fulfilling the greater promise of digitised banking. They could also save banks a lot of money: according to Santander, a bank, by 2022 such ledgers could cut the industry’s bills by up to \$20 billion a year. Vendors still need to prove that they could deal with the far-higher-than-bitcoin transaction rates that would be involved; but big banks are already pushing for standards to shape the emerging technology. One of them, UBS, has proposed the creation of a standard “settlement coin”. The first order of business for R3 CEV, a blockchain startup in which UBS has invested alongside Goldman Sachs, JPMorgan and 22 other banks, is to develop a standardised architecture for private ledgers.

The banks’ problems are not unique. All sorts of companies and public bodies suffer from hard-to-maintain and often incompatible databases and the high transaction costs of getting them to talk to each other. This is the



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problem Ethereum, arguably the most ambitious distributed-ledger project, wants to solve. The brainchild of Vitalik Buterin, a 21-year-old Canadian programming prodigy, Ethereum's distributed ledger can deal with more data than bitcoin's can. And it comes with a programming language that allows users to write more sophisticated smart contracts, thus creating invoices that pay themselves when a shipment arrives or share certificates which automatically send their owners dividends if profits reach a certain level. Such cleverness, Mr Buterin hopes, will allow the formation of "decentralised autonomous organisations"—virtual companies that are basically just sets of rules running on Ethereum's blockchain.



One of the areas where such ideas could have radical effects is in the "internet of things"—a network of billions of previously mute everyday objects such as fridges, doorstops and lawn sprinklers. A recent report from IBM entitled "Device Democracy" argues that it would be impossible to keep track of and manage these billions of devices centrally, and unwise to to try; such attempts would make them vulnerable to hacking attacks and government surveillance. Distributed registers seem a good alternative.

The sort of programmability Ethereum offers does not just allow people's property to be tracked and registered. It allows it to be used in new sorts of ways. Thus a car-key embedded in the Ethereum blockchain could be sold or rented out in all manner of rule-based ways, enabling new peer-to-peer schemes for renting or sharing cars. Further out, some talk of using the technology to make by-then-self-driving cars self-owning, to boot. Such vehicles could stash away some of the digital money they make from renting out their keys to pay for fuel, repairs and parking spaces, all according to preprogrammed rules.

What would Rousseau have said?

Unsurprisingly, some think such schemes overly ambitious. Ethereum's first ("genesis") block was only mined in August and, though there is a little ecosystem of start-ups clustered around it, Mr Buterin admitted in a recent blog post that it is somewhat short of cash. But the details of which particular blockchains end up flourishing matter much less than the broad enthusiasm for distributed ledgers that is leading both start-ups and giant incumbents to examine their potential. Despite society's inexhaustible ability to laugh at accountants, the workings of ledgers really do matter.

Today's world is deeply dependent on double-entry book-keeping. Its standardised system of recording debits and credits is central to any attempt to understand a company's financial position. Whether modern capitalism absolutely required such book-keeping in order to develop, as Werner Sombart, a German sociologist, claimed



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in the early 20th century, is open to question. Though the system began among the merchants of renaissance Italy, which offers an interesting coincidence of timing, it spread round the world much more slowly than capitalism did, becoming widely used only in the late 19th century. But there is no question that the technique is of fundamental importance not just as a record of what a company does, but as a way of defining what one can be.

Ledgers that no longer need to be maintained by a company—or a government—may in time spur new changes in how companies and governments work, in what is expected of them and in what can be done without them. A realisation that systems without centralised record-keeping can be just as trustworthy as those that have them may bring radical change.

Such ideas can expect some eye-rolling—blockchains are still a novelty applicable only in a few niches, and the doubts as to how far they can spread and scale up may prove well founded. They can also expect resistance. Some of bitcoin's critics have always seen it as the latest techy attempt to spread a "Californian ideology" which promises salvation through technology-induced decentralisation while ignoring and obfuscating the realities of power—and happily concentrating vast wealth in the hands of an elite. The idea of making trust a matter of coding, rather than of democratic politics, legitimacy and accountability, is not necessarily an appealing or empowering one.

At the same time, a world with record-keeping mathematically immune to manipulation would have many benefits. Evicted Ms Izaguirre would be better off; so would many others in many other settings. If blockchains have a fundamental paradox, it is this: by offering a way of setting the past and present in cryptographic stone, they could make the future a very different place.



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WA RUC PILOT PROJECT OPERATIONAL FINDINGS

January 8, 2020

 **WA RUC**

WA RUC Operational Findings

Milestone Solutions, LLP (formerly D'Artagnan Consulting, LLP)

January 8, 2020

This paper provides operational findings from the WA RUC Pilot Project that are not included in other sections of the Pilot Project report. For example, lessons learned about Department of Licensing Subagents, Interoperability, and other topics, are covered in specific sections or appendices of the report. This paper includes Operational Findings from the WA RUC pilot on the following three topics.

- I. Invoices
- II. Odometer Reporting
- III. Participant Management, RUC Data Collection and Reconciliation

I. Invoice Operational Findings and Recommendations

Monthly RUC Invoices were the primary means by which Road Usage Information was regularly communicated to participants.

The testing team noted the following challenges with invoices during WA RUC pilot operations. A potential solution for each challenge is included in the discussion.

1. **Service Providers interpreted Business Rules differently.** Business Rules were used as specifications of invoice content and appearance, so the different interpretations by Service Providers resulted in different appearing invoices. For example, service providers interpreted rounding rules, charts, time stamps, cut-off dates, and the means of reporting mileage reporting methods differently. To fix these differing interpretations by service providers, any element of an invoice should be specified very precisely.
2. **No single invoice layout satisfied all user categories.** Each mileage reporting methods had different invoice requirements, as did users who had multiple vehicles and users who switched mileage reporting methods. One service provider, DriveSync, observed during pilot operations that the majority of participants preferred to have summary of their invoice on the first page and detailed information on the next pages. To deal with this situation, it is advisable to start each Invoice with a summary, and then have sections on each vehicle, customized to its current mileage reporting method.
3. **Service providers did not precisely comprehend chart specifications** included in the business rules. That resulted in several chart corrections after implementation. To prevent this from recurring, chart specifications should be written more precisely, and invoice designs should be thoroughly tested early in the project.

To fix these challenges and more, the testing team learned a number of important lessons relevant for invoicing in future RUC systems

1. **Plan invoice specifications earlier and more formally**, by doing the following:

- Hold detailed discussions or a workshop on invoices to discuss business rules and lay-out for invoices. Include user-centric design principles and hire a design firm to help with invoice layout.
- Start invoice design review earlier. First, work with state agencies on a low fidelity design to test with end-user acceptance. Then iterate, i.e., based on the end user feedback on each version of the invoice, build complexity and then refine invoices with end user feedback over a period of months, before the system is in live revenue operations.
- Employ invoice layouts designed specifically for the primary user types. User types/invoices vary by mileage reporting method, number of vehicles, and whether a vehicle is electric or not. Include variable message boxes, so each invoice can include a customized message. These templates should be included from the start of the project. It was difficult to change the template once the project was launched as everything was designed with one template in mind.
- Clearly define business rules for charts. Define them so precisely that they cannot be subject to misinterpretation, though not so prescriptively as to limit Service Provider creativity.

2. Improve invoice data processing through more comprehensive specifications, by doing the following:

- Define rules for vehicle enrollment date and mileage report capture date precisely. Define reference date to start accepting mileage reports. Account management system and mileage reporting system should have same time reference so service provider systems do not have to manage exceptions due to conflicting time/date information (For example, reception of first mileage report before account creation date, and vehicle cancellation and vehicle enrollment on the same day).
- Define invoicing period and cut-off dates precisely. Clarify which transactions to include in the monthly and quarterly invoices (e.g. participants who begin at the middle of an invoicing period, or participants who switch mileage reporting methods and move from monthly to quarterly cycle. These participants receive a single quarterly invoice covering the monthly mileage reporting method transactions and quarterly mileage reporting methods transactions. A single invoicing period is indicated on the invoice header). Also, clarify cut-off dates and time (UTC dates vs Local Pacific Time difference) especially for mileage reporting methods based on odometer readings. Invoices had to be corrected to consider odometer readings submitted before 12 am PT (local time) and not UTC.

3. Increase invoice standardization across Service Providers. In the WA RUC Pilot, service providers applied different rules based on different interpretations and system capabilities, specifically on when to issue invoices and on mileage and dollar rounding. Emovis issued one invoice per vehicle, and only issued invoices when there was driving activity in a given period. Also, emovis only issued single receipts for mileage permits and no subsequent periodic invoices. By contrast, DriveSync issued a single (combined) invoice per participant showing multiple vehicles and issued invoices for all mileage

reporting methods even if there was no driving activity. Further, the two service providers applied different rounding rules—DriveSync rounded at the transaction level, and emovis rounded at the invoicing level. Thus:

- Specify when and how invoices should be issued. Ideally, issue invoices every period, regardless of activity, and require combined (multi-vehicle) invoices be issued to multi-vehicle accounts.
- Cover all exceptional cases for which invoices should be generated and specify exact timing (e.g. final invoices after vehicle change, mileage reporting method change, account closure)
- Specify rounding rules. Ideally, leave all transactions unrounded, and require rounding only at the invoice level.

4. Improve invoicing dry runs. The testing team held invoicing dry runs each month, in which the testing team reviewed invoices of both service providers to catch any potential errors. These dry runs were vital to ensuring quality invoices. The following two new requirements would have made the Dry Run process smoother, but would have required significant development effort by service providers, so were not implemented during the WA RUC pilot:

- Require invoice generation and invoice delivery to be separate processes on service provider systems in order to ensure smooth dry runs. This would allow the testing team to see the actual invoices that would be received by participants, and prevent dry runs from leading to transmittal of erroneous email notifications.
- Require service providers to support invoice transmittal email contents that vary based on user profile. Having different transmittal email contents (instead of the same content for all participants) would have allowed payment demonstration participants to know that they actually had to pay their invoices, and allow an extra reminder message for participants who were noncompliant for a given reporting period.

5. Ensure closed vehicles are not included on invoices. Once a vehicle is removed from the pilot, one final invoice should be issued for the vehicle and then all information on that vehicle should be removed from future invoices.

Finally, the tested team determined a recommendation that should be implemented when scaling up to a large-scale operational system—one that includes 100,000 or more participants. In that case, the system should use rolling invoicing (not tied to calendar month, with different participants receiving invoices on different days. Doing so will ease load management (DS team had activity peaks focused on 1-2 days), and eliminate issues resulting from cut-off time/day and invoicing periods.

II. Odometer Reporting Operational Findings and Recommendations

Issues with odometer reporting were the most frequent participant-reported issues in the pilot. These issues included both the image capture process and the notifications to participants to

complete the image capture process. Thus, improving the odometer reporting process would bring a significant improvement to the overall user experience of any RUC program that includes odometer reporting.

Participant complaints about odometer reporting during the WA RUC pilot included the following:

- Erroneous reminders
- Glitches with photo submission
- Reminders being too frequent
- Reminders coming too early
- Stress of having to report before travel away from vehicle
- Lack of acknowledgement that odometer picture was received
- Difficulty finding odometer readings submitted on online account
- Confusion on odometer reporting after a change of mileage reporting method

Beyond these complaints, the following sources of error / issues with odometer reading were observed during the pilot:

1. **Lack of strict separation between testing and production environments.** Lack of strict separation between test and live environments caused erroneous reminders to be sent. To fix this source of error, there should be strict separation between test and live environments.
2. **Imperfect operational processes.** Specifically, there were inconsistent manual overrides of odometer reading notifications (e.g., manual suppression of notifications), and there were coordination issues between notification sources (service provider, smartphone app vendor) and channels (emails, texts, service provider app, app used by DOL subagents, smartphone app). To fix these processes, manual overrides should be fully tested; and all notifications should be fully coordinated between notifier sources.
3. **Technical issues with odometer processing system.** Specifically, there were communication issues between odometer photo capture software (including app used by DOL subagents) and odometer photo processing system, leading to some odometer photos not being received and processed.
4. **Technical issues between vendor systems.** There was a relatively long processing time of odometer photos causing some odometer readings to be stuck between the odometer photo processing system and the service provider system.

To fix these challenges and more, the testing team learned a number of important lessons relevant for odometer reporting in future RUC systems:

1. **The first notification to send in an odometer image should be made as soon as the account is created.** The request that the user send in the initial odometer image should be made as soon as the user completes account creation, instead of 24 hours or more later.

2. **Odometer readings should be included on invoices and the web portal.** Display at least two odometer readings on invoices (first and last). Make submitted odometer images available on the web portal.
3. **Always send an acknowledgement email or text following odometer image submission.** The acknowledgement should include a link to the odometer image on the online account, if possible.
4. **Optimize timing/frequency of notifications.** Adjust frequencies and chose a reporting window for odometer readings based on user feedback. Not all users will be satisfied—some will want more, and some fewer reminders. If possible, allow users to customize timing/frequency of notifications. Note that in an operational system, the threat of penalties will encourage compliance in a way that cannot be achieved in pilots.
5. **Allow participants to report their readings anytime.** Encourage reporting within every quarter. Specifically, this should allow participants who are travelling to report any time before and/or after their travel.
6. **Check any manual override of the notification system carefully.** Ensure that when a manual override to the automated reminder system is implemented, it is triple checked, or checked at a higher level, to ensure that the manual override is correct.
7. **Ensure users who change mileage reporting methods fully understand what will change.** Specifically, explain change of invoicing cycle and odometer reporting obligations better, including any change in invoicing cycle frequency, new odometer-reporting obligations, and new date of next invoice. This could be done by voice from a customer service representative, by email, or ideally, both.
8. **Plan for sufficient time to test integration between vendor systems.** Extensively, test integration and workflows between different vendor systems that support mileage reporting methods using odometer photo capture.

III. RUC Participant Management and Data Collection Operational Findings and Recommendations

RUC Participant Management and RUC Data Collection are the two functions of the state information technology system that would be needed in an operational RUC program. This section discusses lessons learned on these two functions.

RUC Participant management is the function of state IT software that provides real-time data on RUC Participants (which service provider and which mileage reporting method they are registered with) and ensures all participants registered only once. It involves service providers reporting participant registration and de-registration to the state. The testing team learned two main lessons about RUC Participant Management Functionality.

1. **Service providers should be required to support this functionality in near real time.** In other words, as soon as a participant registers with a Service Provider, the Service Provider should provide that participant's information to the state IT system via an Application Programming Interface (API). During the pilot, one service provider could

not support a near real-time interface, which caused a number of issues, including the inability to get accurate real-time information, and

- 2. RUC Program Indicators should be defined before the system is built.** The RUC Participant Management functionality should provide information like the number of participants on each mileage reporting method, on each service provider, and their level of compliance. The precise indicators should be fully developed before the system is built.

RUC Data Collection or RUC Accounting (RUCA) is the function of state IT software that collects travel and revenue data on RUC Participants from service providers—miles traveled in state on public roads, in state off public roads and in other states, as well as the RUC charges associated with these miles, and associated data, such as whether devices were unplugged and for how long. It involves service providers reporting data to the state periodically, i.e., monthly. The testing team learned three main lessons about RUC Data Collection or Accounting Functionality.

- 1. RUC Data Collection should be thoroughly tested before system is taken live.** Not just that numbers communicate, but that they mean the same thing across all vendor systems.
- 2. Fixing data retroactively is challenging but feasible.** When data was found to be incorrect in the database, it was possible to send new data. However, older data is typically not deleted, so it is vital to ensure that the new/correct data is always used when appropriate. It is best to avoid sending incorrect data, but if and when issues are discovered, it is feasible to correct them.
- 3. Fixed period data reporting is feasible and desirable for small programs; larger programs will require rolling reporting.** In the pilot, monthly reporting was used and found to be feasible and desirable. With a large program (100,000+ participants) it will likely be necessary to implement rolling reporting that does not coincide with a reporting period.
- 4. Prepare for reconciliation of invoices with Road Usage Charge Accounting (RUCA), the state data collection mechanism, by doing the following:**
 - Establish consistent RUCA rules and invoicing rules. Establish the rules at the same time to ensure consistency.
 - Specifically, ensure that the RUCA reporting period and invoicing periods are identical. In case of rolling invoicing periods, this is not possible, so use appropriate rolling period accounting techniques to establish RUCA reporting periods.
 - Further, ensure that the transactions contained in invoices and RUCA reports are the same. For example, in the WA RUC pilot, questionable or quarantined transactions were included in the RUCA report, but were not necessarily included in the corresponding invoicing period.



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RECORD OF DECISIONS, WA RUC
RECOMMENDATIONS, WASHINGTON STATE
TRANSPORTATION COMMISSION MEETING

December 17, 2019

 **WA RUC**

WSTC RECOMMENDATIONS

Presented for Adoption at WSTC Regular Meeting,
December 17, 2019

Jeff Doyle
D'Artagnan Consulting

PROPOSED ADOPTION BY CONSENSUS (single vote of WSTC) (1 of 3)

- R1** Recommend implementation options that allow RUC to gradually scale up, offering drivers an opportunity to try the system and recommend further improvements while RUC is still in an early-implementation stage.
- R2** Recommend that additional research be conducted (alone or in collaboration with other states) on differential RUC rates based on driver, vehicle, or infrastructure characteristics.
- R3** Recommend research be conducted in collaboration with other states that are implementing RUC to better understand compliance gaps and potential enforcement measures.
- R4** Recommend additional time and appropriate testing grounds (i.e., limited number of vehicles) to improve RUC before pursuing any wider statewide implementation.
- R5** Recommend that in an Initial start-up stage of RUC, compliance and enforcement mechanisms must be tested and developed.
- R6** Recommend that existing delivery mechanisms (e.g., public-private partnerships) be considered to most efficiently develop a RUC system that reduces the cost of collections.

PROPOSED ADOPTION BY CONSENSUS (single vote of WSTC) (2 of 3)

- R7** Recommend that cost reduction strategies be tested on a limited set of vehicles in an Initial start-up stage of RUC.
- R8** Recommend that border-area testing be conducted in an Initial start-up stage of RUC.
- R9** Recommend that ODOT's OReGO program be engaged to further explore bi-state RUC solutions for frequent WA-OR travelers.
- R10** Recommend specific changes in Washington statutes that protect personal privacy in a RUC program.
- R11** Recommend testing of new personal privacy protections during an Initial start-up stage of RUC.
- R12** Recommend that state agency vehicles be utilized as test subjects for privacy protection testing.
- R13** Recommend that during a transitional period while the gas tax remains in place, the same policy-setting and oversight roles between the Legislature, WSTC, and other agencies and the private sector should be retained.

PROPOSED ADOPTION BY CONSENSUS (single vote of WSTC) (3 of 3)

- R14** Recommend alternative RUC transition scenarios for legislative consideration in 2020 that specifically consider:
- Participants' preferences for implementation time frame and vehicles subject to RUC;
 - Advent of electric and high MPG vehicles, their effects on revenue, and current programs to incentivize adoption;
 - The need for continued development and testing of a RUC system before any wide-scale implementation;
 - *Forward Drive* project timing, which is aimed at reducing the cost of collections for RUC; and
 - The availability of state fleet vehicles as part of an Initial start-up stage for RUC.
- R15** Expenditures of RUC revenue should be made subject to Amendment 18 (restricted to highway purposes).
- R16** Current programs that receive gas tax refunds attributable to non-highway activities should continue receiving their same share of funding during the transitional period to RUC (expected to be at least 10 to 25 years), since the state gas tax will remain in place during this transition.

WSTC Final Report for the Washington
State Road Usage Charge Assessment

January 2020

Volume 3 // Appendices

