WASHINGTON STATE ROAD USAGE CHARGE

STEERING COMMITTEE MEETING

Mercer Island Community & Event Center,

8236 SE 24th Street, Mercer Island

July 27, 2017

Washington State
Transportation Commission

Washington State
Department of Transportation

Consultant support provided by:

WA RUC

Contents

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Briefing Book in Support of July 27, 2017 Meeting

Introduction

Briefing Book in Support of July 27, 2017 Meeting

Purpose of this briefing book

This briefing book is provided to RUC Steering Committee members as background reading in preparation for the July 27, 2017 meeting. The materials within this document provide details on corresponding topics to be reviewed and discussed at the meeting. During the meeting, slide presentations will provide a summary of each topic (but not repeat all details), so it will be helpful for members to have read the content of the briefing book prior to the meeting. The project team is happy to answer any questions that arise prior to or during the meeting.

Overview of briefing book contents

Section 1 is a comprehensive status report on the Washington Road Usage Charge Pilot Project Stage 1 work plan. Stage 1 comprises final design, contracting, testing and setup activities. Stages 2 and 3 include the 12-month live pilot and final evaluation and reporting.

Section 2 provides details regarding the Washington RUC Smartphone Innovation Challenge held from January to June 2017.

Section 3 provides summary information on the statewide public survey results conducted as part of the Baseline Public Attitude Assessment task.

Section 4 provides information on the statewide focus group sessions currently underway.

Section 5 provides a recap of the numerous policy issues that have been flagged by the Steering Committee for analysis. This information will form the basis for a moderated discussion at the July 27 meeting.

Appendix A is a summary of the adopted Concept of Operations for the Washington RUC Pilot Project. The project team recently updated this material to reflect small adjustments made to the proposed pilot operations. Steering Committee members have reviewed this several times before; we include it only as an update, not as an agenda item for the upcoming Steering Committee meeting.

Briefing Book in Support of July 27, 2017 Meeting

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Briefing Book in Support of July 27, 2017 Meeting

Section 1: Status of RUC Pilot Project Preparations

Prepared by D'Artagnan Consulting

July 27, 2017

Stage 1 of the pilot project includes all preparatory activities up to the live pilot launch, grouped into four major task

This section of the Briefing Book provides a progress report on the major tasks involved in preparing to launch 12-month statewide live pilot test with over 2,000 volunteer vehicles from Washington, plus additional participants from Oregon, Idaho, and British Columbia.

This section summarizes the work to date across the four major tasks:

- ► Task 1: Pilot Design and Set-up
- ► Task 2: Comprehensive Public Attitude Assessment
- ► Task 3: Public Communications and Participant Engagement
- ► Task 4: Project Management, Oversight and Policy Development

✓ = Activities or materials that have been completed.

► = Activities or materials that are scheduled but not yet complete.

Task 1: Technical documentation and procurement of RUC service providers is complete

Task 1, Pilot Design & Set-up, is the largest task and constitutes most of the technical activities required to operate a large-scale public demonstration project. Below is a status report for several sub-tasks:

✓ **Technical documents updated**: The project team finalized the System Requirements Specification (SRS), the Interface Control Document (ICD) and the final Concept of Operations (ConOps) for the pilot project to reflect development of the RUC Hub concept (described on next page), as well as to reflect the Steering Committee's recommended changes to the Washington pilot operational concepts (notably, the replacement of the Time Permit with the Mileage Permit for the pilot test).

✓ **Procurement of service providers (account managers and technology firms) to support the pilot:** The Commissions' prime contractor is procuring two service providers responsible for supplying mileage reporting technologies, managing pilot participant RUC accounts, and providing simulated RUC invoices for Washington, British Columbia, and Idaho drivers. Oregon drivers participating in the Washington pilot project will continue to use their own account managers for these same services.

D'Artagnan drafted and issued all procurement-related documents on June 1 and selected three semi-finalist firms in mid-June. All three firms have experience in RUC. Importantly, all three firms have undergone prior government testing and certification to provide RUC revenue collection services for the State of Oregon, which is the only state that has an operational RUC revenue collection program. D'Artagnan will announced the two firms selected once contracts have been signed, potentially in time for announcement at the July 27, 2017 Steering Committee meeting.

Washington's RUC "Hub" is under construction to test multi-jurisdictional payment reconciliation between Oregon and Washington

✓ **Design of the RUC Hub is complete; set-up underway**: The final design of the multijurisdictional RUC clearinghouse function (the "Hub", for short) was completed in May. The Hub is the manifestation of the Washington pilot project's effort to test interstate and international interoperability of RUC. The project team is developing the software and operational system which will be built and tested during Stage 1 and readied for operation and maintenance during the live pilot test period.
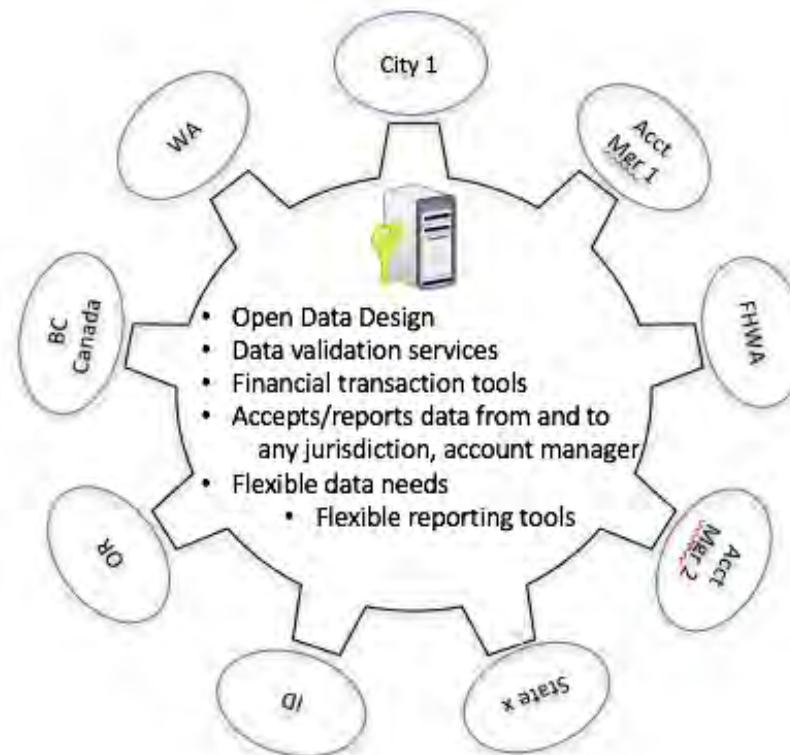
The project team must complete other pilot design and set-up activities prior to launch of the live pilot test (page 1 of 2)

► **Pilot project help desk set-up**
The bulk of the work for this task will occur after selection of RUC service providers and once recruitment is underway. In June, the project team established telephone numbers for the Help Desk. These team will also use these numbers as general project information lines prior to the volunteer enrollment and live pilot phases.

► **Partnerships with DOL agents/subagents for providing support for in-person odometer mileage verification**
In June, the Department of Licensing (DOL) received a question regarding the role of their licensing agents and subagents in the live pilot test. The project team provided a description of the pilot project and the potential role that subagents (private businesses that provide licensing services on behalf of the state) might play during the live pilot test. DOL distributed this information to their network of vehicle licensing agents and subagents.

The project team will reach out to subagent offices once participant recruitment is underway. It is important to target subagent support in areas near large concentrations of RUC participants who choose to test the in-person verified odometer reading method. The project team will coordinate initial outreach to subagents with DOL.

Other pilot design and set-up activities must be completed prior to launch of the live pilot test (page 2 of 2)

► **Organizational Design:** The objective of this task is to develop a notional organizational structure for a future live RUC program, if one is adopted by the legislature. A high-level organizational assessment was conducted in Phase 0 (2016 WSTC RUC work plan) for the limited purpose of identifying potential roles in the current pilot project. Initial scoping of the organizational design for a future RUC program will not begin until after the July 1 start of the new fiscal year, since this activity is not required to proceed with the statewide RUC live pilot test.

► **Finalize the Pilot Evaluation Plan:** The project team is currently reviewing factors that might affect the evaluation plan. Factors that might affect the final plan include: the results from the Public Attitude Assessment work (Task 2); public comments and media portrayals of the WA RUC pilot; further direction from policymakers; demographic composition of the selected pilot participants (Task 3); and capabilities of the selected vendors to provide data from the pilot test. Given these outstanding factors (as well as the fiscal year 2017 appropriations cap of $550,000), the policy & evaluation team will not ramp up this work until August 2017.

Task 2: Comprehensive public attitude assessment is nearing completion

Task 2 covers all of the public attitude assessment activities leading up to the launch of the live pilot test. There are three primary deliverables: the statewide telephone survey; regional focus groups; and a comprehensive report of public attitudes regarding RUC prior to a statewide demonstration project.

✓ **Baseline public attitude survey completed:** The project team conducted a statewide telephone survey between June 2-7, 2017. The survey recorded 602 complete responses. Section 3 of this Briefing Book offers a top-level summary of general public attitudes toward transportation funding (RUC in particular).

► **Focus group sessions are underway:** Focus group sessions are underway, with the last session scheduled for July 25, 2017 in Vancouver, WA. Initial results of the statewide telephone survey were used by the project team to develop the plan, selection process and script for the focus Ggroup sessions. See Section 4 of this Briefing Book for more detail.

► **Final Baseline Public Attitudes report must wait until focus group sessions are complete:** This deliverable will analyze the results from the general public baseline survey responses and the focus group sessions and provide findings in a comprehensive report. The final report cannot begin until the results of all five focus groups are complete.

Task 3: Public communications materials are available and ready for use

Foundational communications materials delivered: The project team has developed materials to provide clear, consistent communications throughout the project, including several items available for Steering Committee review at the July 27 meeting. Materials completed include:

- ✓ **Basic PowerPoint presentation** for use during public outreach meetings. This basic deck is oriented for general public audiences (as opposed to the more detailed presentation deck intended for transportation policymakers and other highly-informed audiences). This basic version is concise, presentable in 10 minutes or less.
- ✓ **WA RUC Project Style Guide** ensures clear, consistent communications, including use of logos, photos, color schemes, etc.
- ✓ **Project Fact Sheet (one-pager)** supports multiple types of speaking engagements and public outreach, intended as a leave-behind. It contains information on how to sign up to follow the project or volunteer for the pilot.
- ✓ **Shared folder (library) of high-resolution images and videos:** A library of project-related photos, icons, images, and (forthcoming) video has been initiated. As the communications team acquires or develops new material, they will upload materials to the shared folder for use by the entire project team, including additional high-resolution images and videos.
- ✓ **Media response protocols,** which includes a detailed flow-chart delineating responsibilities among the project team and WSTC for responding to media inquiries. This information has already been shared with WSTC staff and WSTC Commissioners to help them quickly identify who on the project team can provide immediate assistance and response to media inquiries.

Additional communications materials and activities include stakeholder listening sessions, and a detailed plan for participant recruitment

✓ **Recruitment plan** has been drafted with strategies and actions intended to attract and retain 2,000+ participating vehicles in the Washington pilot project. July and August will be peak planning and preparation months leading to full-scale recruitment launch in late August through Fall 2017.

► **1:1 listening sessions** to help inform project communications strategies. The project team is meeting separately with groups not represented on the Steering Committee but who nonetheless have an interest in RUC. These meetings are intended as "listening sessions" that allow stakeholder groups to express their initial reactions, concerns, opinions, and interests.

Task 4: Policy development, project management, oversight and reporting

While most of the activities required under Task 4 relate to project management, administration and reporting, this task also requires detailed analysis of policy issues raised over the last few years by the Steering Committee.

► **Policy issue research topics ("parking lot" issues) to be prioritized for technical memo development:** Using the list of policy issues identified during the Steering Committee meetings over the past four years, the project team will propose research and analysis of those issues. The Steering Committee will review the proposed policy issue research plan at the July 27, 2017 meeting and help refine and prioritize the research plan.

Schedule-at-a-Glance: important milestones for pilot project set-up

The schedule on the following page shows expected delivery dates for key project milestones in Stage 1, including all preparations and set-up prior to launch of the 12-month live pilot test in January 2018.

WA RUC Pilot Schedule Steering Committee Meeting

Task Name	Q1			Q2			Q3			Q4			Q1		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1 ⊟ Washington RUC Pilot Project Stage I															
2 Project NTP			◆												
3 Project Kick-Off Meeting			◆												
4 ⊟ Task 1: Pilot Test Design and Set-up Activities															
5 Pilot Concept of Operations, System Requirements, and Interface Control Document					◆										
6 Design of clearinghouse (HUB)					◆										
7 Conduct privacy impact assessment							◆								
8 NTP for Service Providers							◆								
9 ⊟ Integrate and Oversee Development & Testing															
10 Integrate Smartphone Challenge Concepts									◆						
11 Unit Test Results Due									◆						
12 Integration Test										◆					
13 End-to-End Test											◆				
14 Begin Pilot Organizational Design								◆							
15 Procurement: Negotiate & Sign Agreements with Subagents											◆				
16 Customer Support: Help Desk Setup and Training													◆		
17 ⊟ Task 2: Comprehensive Public Attitude Assessment regarding RUC in Washington															
18 General Public Surveys - Baseline					◆										
19 General Public Focus Groups - Baseline							◆								
20 Baseline Public Attitude Assessment Report								◆							
21 Pre-Pilot Participant Surveys													◆		
22 ⊟ Task 3: Project Communications and Participant Engagement															
23 Recruitment Materials Development								◆							
24 Website Management															
25 Participant Recruitment Phase											◆				
26 ⊟ Task 4: Project Management, Oversight and Policy Development															
27 FAST Act Submittal					◆										
28 Development of Work Plan for Policy Papers								◆							
29 Washington RUC Steering Committee Meeting (Summer)								◆							
30 Washington RUC Steering Committee Meetings (Fall)													◆		
31 ⊟ Project Reporting (State, Legislative and Federal)															
32 Project Reporting (State, Legislative and Federal)								◆							
33 Project Reporting (State, Legislative and Federal)											◆				
34 Project Reporting (State, Legislative and Federal)													◆		

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Briefing Book in Support of July 27, 2017 Meeting

Section 2: Smartphone Innovation Challenge

Prepared by D'Artagnan Consulting

July 27, 2017

The Smartphone Innovation Challenge, a sponsored competition, sought to improve smartphone approaches for mileage reporting

Original concept for an all-day "hackathon" or "developer codefest" evolved into something bigger. The original Washington 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, not controlled by the government or a private company.

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 need for the forthcoming live pilot test. Instead, the team began collaborating with **CoMotion**, the organization within the University of Washington that helps public agencies and private firms partner with UW researchers to develop new ideas, services and products.

With help from CoMotion, the project team assembled and mentored four teams of student researchers that expressed interest in working on road usage charge design, software, and technology.

18

The project team presented the primary challenges with using a smartphone for RUC 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 use additional equipment just for mileage reporting.

There are many software apps already available that record trips. However, RUC presents unique challenges that must be addressed. Some of these challenges include:

► 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 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 application 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 from the UW **Electrical Engineering** (EE) Department participated. They designed a Washington RUC smartphone app for the Android smartphone operating system. They prepared 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 an IOS (iPhone) operating system. 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

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 representatives from CoMotion, UW Faculty Advisory Board, Challenge Seattle, Mobility Innovation Center, WSTC, WSDOT, 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).

A local Public Broadcasting Station affiliate, KCTS Channel 9, is exploring the possibility of running a feature on the unique collaboration between these UW student research teams and government (WSTC, FHWA) as they try to solve a transportation funding problem. The associate producer has asked for basic information and may be contacting the project sponsors and the students for follow-up information and potential interviews.
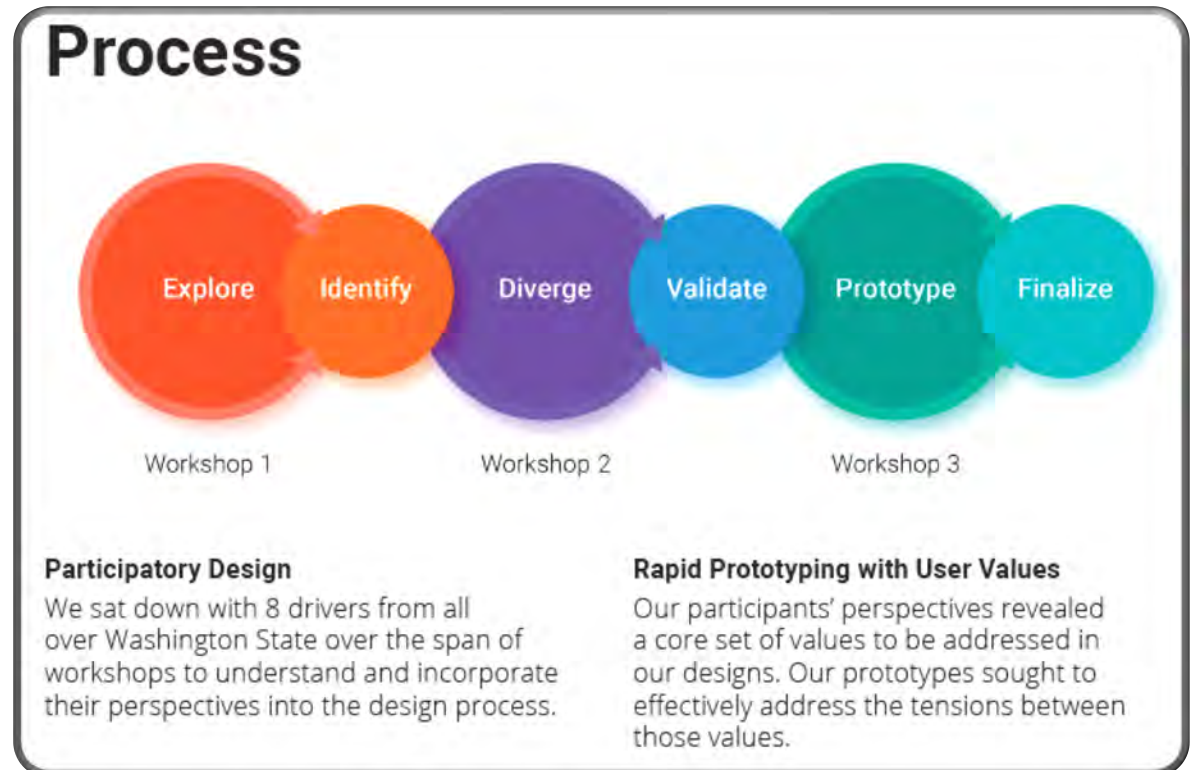
Excellence Award Spotlight: HCDE Team's "*Participatory Design*" process allows drivers to design a smartphone app for RUC

Human Centered Design & Engineering (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 employed by the HCDE team first assembled a group of volunteers from the general 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.
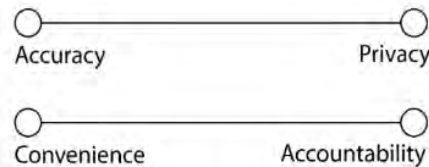

Process

Explore · Identify · Diverge · Validate · Prototype · Finalize

Workshop 1 · Workshop 2 · Workshop 3

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.

"*Participatory Design*" process allows drivers themselves to design a smartphone app for RUC (continued…)

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. **Workshop 2** began to explore these contrasts, with the volunteers conducting the balancing between drivers' preferences and legitimate government interests.

Workshop 2 *diverge and validate*

Accuracy — Privacy

Convenience — Accountability

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 then 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.

Explored the values of 8 participants through a series of interactive activities.
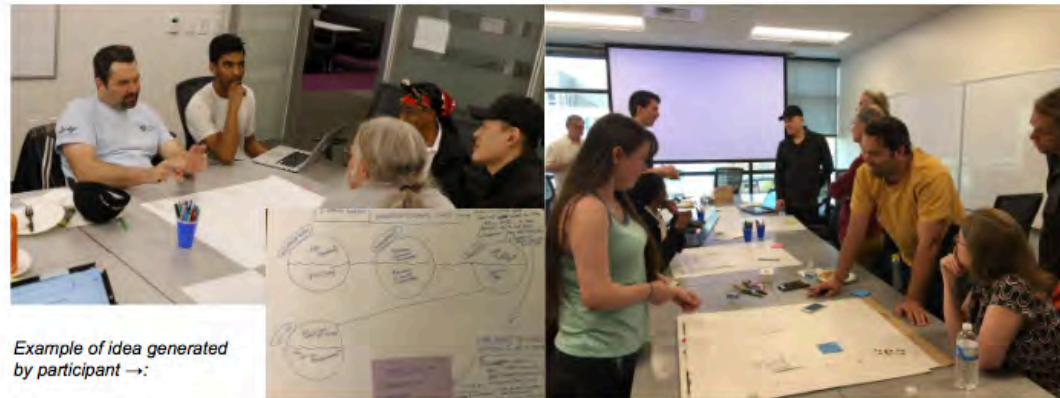
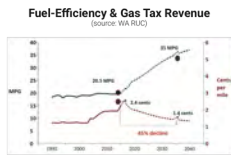Example of idea generated by participant →:

Snapshots of Smartphone Innovation Challenge from select teams

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
(source: WA RUC)

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
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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.

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) Choi
Molly Fallen
Michael Fernandes
Alex Gilbert

Sponsored by
Washington State Transportation Commission with support from
· D'Artagnan Consulting
· The Mobility Innovation Center

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 ODB-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

Some results can be incorporated into the Washington RUC pilot project

The following approaches and features developed through the Smartphone Innovation Challenge will be forwarded to the RUC Service Providers for possible integration and testing in the live pilot:

1. Application of *Participatory Design* principles in the development of a user interface for a RUC smartphone application (HCDE Team/Glibert-Choi-Fernandes-Fallen)

2. Simple, "no-look" swipe on the smartphone screen to activate or deactivate mileage recording (iSchool Team/Babbs-Brown-Fox-Nordale-Saksena)

3. Toggle on/off location-based mileage recording to ensure out-of-state miles are deducted from a drivers' RUC account (all teams)

4. Border Proximity Detection, where audible sounds remind drivers to activate the out-of-state mileage detection feature as the vehicle approaches a state border (Electrical Engineering Team/Tran-Nguyen-Lu-Yu)

5. "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") (HCDE Team/ Glibert-Choi-Fernandes-Fallen)

6. User-friendly "explainer" video with simple animation to help explain RUC, and possibly reduce driver apprehension regarding smartphone apps (HCDE Team/Chiang/Jean/Lou/Luo)

7. 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. (HCDE Team/Chiang/Jean/Lou/Luo)

Section 3: Baseline Public Attitude Assessment: Statewide Survey Results

Prepared by D'Artagnan Consulting

July 27, 2017

A statewide public opinion survey provides a baseline snapshot of Washingtonian views and understanding of transportation funding

The project team conducted a telephone survey of Washingtonians from June 1 to June 7, 2017 to assess public perceptions of transportation funding, views of the gas tax, and familiarity with RUC. The research serves as a baseline measurement of general public opinion prior to launching pilot project recruitment. Results from the telephone survey were used to guide development of topics for five focus groups, which were conducted in July 2017, as well as to inform the development of communications efforts for RUC volunteer recruitment and pilot testing.

Research Methodology: The telephone survey consisted of 602 Washington residents and took approximately 17 minutes to complete. Quotas were established for multiple subgroups, including age, gender, level of education, and region of the state to ensure the sample was representative of Washington's population. The survey results have a margin of error of +/- 4% at a 95% confidence interval.

Respondents were contacted by a live interviewer. Both landlines and cell phones were dialed. A variety of quality control measures were employed, including questionnaire pre-testing and validation.

The survey sample reflects Washington as a whole

Respondents were asked to self-identify whether they live in a rural, suburban, or urban area:

Response Category	n=602
Rural	36%
Urban	22%
Suburban	39%
Don't know	2%

Respondents were asked to self-identify their race and ethnicity.

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%
Refused	4%

In addition, information about household income, educational attainment, gender, age, and political orientation was collected for analysis.

Key results confirm that although residents identify transportation as a statewide issue, they are skeptical of new revenue to pay to address challenges

Below is a summary of the key survey results.

► **Transportation issues were on the minds of Washington residents**. When asked what is the most important issue in Washington that they would like elected official to address, residents identified transportation (17%) and education (16%) as top priorities. Roads and infrastructure were the most common transportation concern, followed by traffic.

► **There will be some challenges in educating the public about the transportation funding outlook.** The majority (64%) felt that state highways in their area were excellent or good, suggesting that they will not necessarily see a strong need for additional funding to maintain the roads. Nonetheless, Washington residents prioritized spending transportation funds to maintain existing roads (50%), followed by investing in public transportation (22%) and building new roads (15%).

► **Traffic congestion is seen as a problem**, with 68% indicating it was a very big or moderate problem. 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.

Key results confirm that although residents identify transportation as a statewide issue, they are skeptical of new revenue to pay to address challenges (continued)

► **Overall, residents seemed predisposed to skepticism about new transportation taxes**. Nearly six in ten (59%) disagreed that the government does a good job managing transportation spending in Washington. A recent gas tax increase and a large public transit package underway in the Puget Sound area may be coloring residents' attitudes. Half of residents (52%) thought the current gas tax (49 cents per gallon) was too much.

► **Education will be needed to help increase understanding of road usage charging**. About half of residents (53%) were familiar with the concept of road usage charging. Residents were essentially split as to whether a road charge was less fair than a gas tax (41%) or about the same/more fair (44% combined). Sixteen percent were unsure, again supporting the need for education about road usage charging.

► **Residents had reservations about switching to a road usage charging program**. 58% opposed this type of transportation funding in Washington, with 40% strongly opposed. 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%).

Observations from telephone survey results

Communication efforts will be important to inform public perceptions about road usage charging. Low familiarity with road usage charging shows need for education; it is also an opportunity to pivot to a more encouraging message about the RUC pilot as a policy research opportunity involving the public.

Six in ten (61%) thought a road usage charge was just another way for Washington government to tax people. To avoid negative overall sentiments toward taxation coloring the participant experience in the pilot, it will be important to communicate facts about how transportation is funded and the contemplated uses of RUC funding, but government agencies may not be the most effective messengers on this issue.

As seen elsewhere, **having all drivers share in paying for roads** is a concern to Washington residents. This may be the most resonant message to start with when recruiting volunteers.

Opposition messages resonated with respondents more strongly than messages supporting road usage charging. The **most effective message** in support of road usage charging research was that it is fairer because all drivers share equally in paying for roads and transportation.

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Selected Survey Highlights

The telephone survey contained thirty-seven questions. Selected questions are highlighted in this section.

Respondents were asked:

▶ What is the most important issue in Washington that you would like your elected officials to address?

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%

Briefing Book in Support of July 27, 2017 Meeting

Affordable housing	4%
Resist Trump	4%
Jobs/Economy	3%
Crime	3%
Environment/Clean energy	3%
Budget/Spending	3%
All other responses	2% or less
Nothing	2%
Don't know/No answer	5%

Briefing Book in Support of July 27, 2017 Meeting

▶ 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 that my fair share	3%
About the right amount	50%
Don't know	5%

▶ 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%

Briefing Book in Support of July 27, 2017 Meeting

► 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 know	1%

► Thinking about paying a road usage charge based on the number of miles driven instead of the gas tax, tell me which is the **most** important issue to you?

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 know	11%

► Please tell me if you feel each statement is a very good reason, good, poor, or very poor reason to **support** road usage charge?

Response Category	Very Good	Good	Poor	Very Poor	Don't know
1. 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%
2. 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%
3. 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%
4. 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%

Section 4: Statewide Focus Group Sessions

Prepared by D'Artagnan Consulting

July 27, 2017

Baseline Focus Groups

The project team conducted a series of focus groups in Washington during July 2017. Focus group participants were selected from a wide range of backgrounds and not for any particular expertise or knowledge of transportation issues.

There were several objectives for the focus groups, which include but are not limited to the following:

- ► Baseline to assess values, priorities and awareness of transportation issues and funding
- ► Determine perceptions and attitudes towards road charging
- ► Identify communications needs and sensitivities for effective public and stakeholder outreach
- ► Gain a better understanding of reasons someone might agree to participate in the pilot

Research Methodology: DHM Research conducted five focus groups among residents of Washington during July 2017. Locations for the focus groups were selected to ensure geographic diversity and correspond with the pilot project's targeted recruitment areas.

Ten participants were recruited for each group with the goal that at least eight participants would appear. The format and guide used for each focus group was very similar, and all five groups were led by the same professional moderator. The dates and locations of the five focus groups are listed below.

Briefing Book in Support of July 27, 2017 Meeting

Focus Group Location, Times, and Sample Parameters	
Group 1: Tri-Cities **Thursday, July 6, 6-8pm**	**Red Lion Richland Hanford House** 802 George Washington Way Richland, WA 99352
Group 2: Spokane **Saturday, July 8, 10am-noon**	**Strategic Research Associates** Spokane Office 25 W Cataldo Avenue, Suite D Spokane, WA 99201
Group 3: Bellingham **Monday, July 17, 6-8pm**	**Towneplace Suites Bellingham** 4050 Northwest Avenue Bellingham, WA 98226
Group 4: Seattle **Tuesday, July 18, 6-8pm**	**Consumer Opinion Services** Seattle Downtown Focus—US Bank Centre 1420 Fifth Avenue, Suite #525 Seattle, WA 98101
Group 5: Vancouver **Tuesday, July 25, 6-8pm**	**Hilton Vancouver Washington** 301 W 6th Street Vancouver, WA 98660

The general approach to the focus groups is to gather unbiased input about concepts that are too complex for brief telephone surveys

► Recruitment targeted 10 participants per focus group, including different driving behaviors (e.g. low and high-mileage drivers, public transit users) and vehicle types (e.g. gasoline, hybrid, and electric vehicles). Recruitment efforts also tried to achieve groups with diverse age, gender, and other demographics.

► For consistency, each two-hour focus group discussion was led by the same moderator from DHM Research.

► Written exercises and other techniques were used to gather responses.

► The focus groups were at neutral locations with easy access to public transit and parking.

Statement of Limitations

This type of research is *not* designed to measure with statistical reliability the attitudes of a particular group. Rather, its value lies in the depth of insight it provides into the attitudes and opinions of the population from which the sample is drawn.

The final focus group has not been completed as of the deadline for this document. An update on focus group status will be provided during the July 2017 Steering Committee meeting, and the final report on public attitude baseline research, which combines insights from the telephone survey and focus groups, will be available in the Fall.

Section 5: Policy Issues Work Plan

Prepared by D'Artagnan Consulting

July 27, 2017

Briefing Book in Support of July 27, 2017 Meeting

The Steering Committee has an opportunity to study the remaining topics in the policy issues registry ("parking lot")

The Steering Committee has maintained an issues registry since 2012 and provided analysis of these issues over the past five years. Throughout the Steering Committee meetings, WSTC meetings, and legislative meetings in 2016, legislators, commissioners, and other stakeholders repeatedly articulated the need to address remaining policy issues on the registry not just through the pilot but through a parallel analysis during the pilot and at the conclusion of the pilot.

The table below shows all the policy issues grouped by priority into three tiers. Analysis of the first four issues in Tier 1 are currently underway as part of Stage 1. The remaining issues will be studied in Stages 2 and 3, but the project teams seeks the Steering Committee's validation of the list and prioritization of issues during the July 27 meeting, starting from the lists in the table below.

Tier 1 Policy Issue: address prior to the launch of the pilot (Fall 2017)	Tier 2: address as an element of the pilot test (2018)	Tier 3: to address separate and apart from the live pilot test (2018-2019)
• **How to operationalize the four RUC operational concepts** ✔	• Driver reaction to the proposed RUC system – will be assessed in pilot	• Interoperability with *GoodToGo* Toll System
• **Whether and how to charge out-of-state drivers** ✔	• Public understanding and acceptance of the proposed system – will be assessed in pilot	• Legal issues (e.g., interstate commerce clause, tax vs. fee, etc.)
• **Exemptions from road usage charges for demonstration** ✔	• State Information Technology needs – will be assessed in pilot	• Per-mile rate setting process and roles
• **Refunds** ✔	• Institutional roles in implementing any future RUC system – will be assessed in pilot	• Motor fuel tax bond requirements
• **Use of private sector account managers**		• Permanent exemptions
		• Use or dedication of RUC revenue
		• Rate setting basis for time-based permit
		• Transition strategy - vehicles subject to paying RUC
		• Interoperability with other states

Briefing Book in Support of July 27, 2017 Meeting

Appendix A: Summary of the Revised Pilot Project Concept of Operations

Prepared by D'Artagnan Consulting

July 27, 2017

Introduction: What is a ConOps?

This Appendix contains a condensed version of the Washington State Road Usage Charge (RUC) Pilot Concept of Operations ("ConOps"). Technical analysis should be based on the complete version of the Concept of Operations. This briefing book provides a higher-level summary only.

The Concept of Operations is a description of how Washington's RUC will operate during the pilot project. The document is nontechnical and presented from the viewpoints of the various stakeholders. This document provides a bridge between the sometimes vague policy goals that motivated the pilot project, and the specific technical requirements that are important at the operational level. There are several reasons for developing a Concept of Operations.
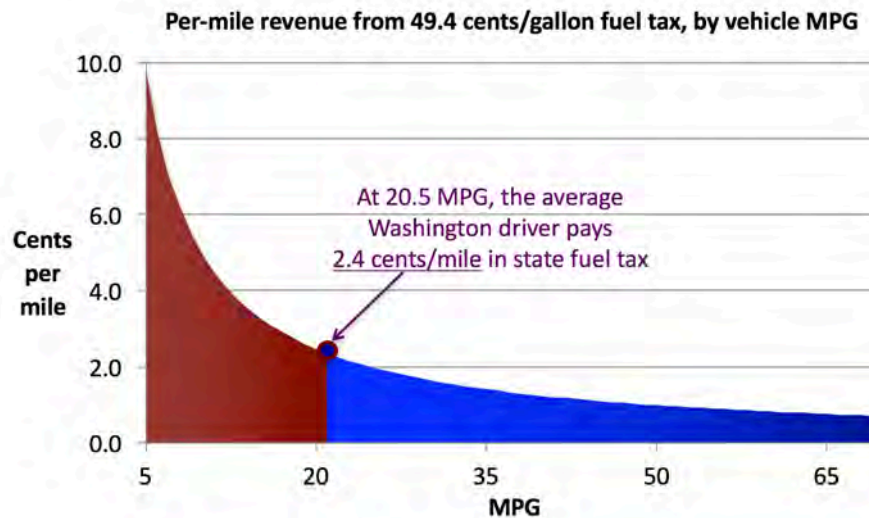
- ► Achieve stakeholder agreement on how the system is to be operated, who is responsible for the required pilot functions, and identifying the necessary lines of communication.
- ► Define the high-level system approach and highlight the advantages over other approaches.
- ► Define the environment in which the system will operate.
- ► Derive high-level requirements, especially user requirements.
- ►Provide the criteria to be used for validation of the completed system.

This ConOps compiles the Washington State RUC Steering Committee's ("Steering Committee") decisions into a single technical document. It describes the planned pilot implementation of the ConOps—as compared with the 2014 ConOps. The ConOps begins with the historical background and policy directions given by the legislature, which guided *technical* decisions. It then describes the Operational Concepts (methods of mileage recording and payment). It concludes with the descriptions of Usage Scenarios—descriptions of how the pilot participants and the pilot team will interact in several contexts.

Background: Highway Funding in Washington State

Historically, user fees have provided the majority of funding for Washington's highways. Highway user fees include fuel taxes (on both gasoline and diesel), registration and licensing fees, tolls, weight fees on heavy vehicles, and Federal funds derived principally from fuel taxes. Fuel taxes represent the most important highway revenue source for Washington. However, improvements in on-road vehicle fuel economy and conversion of the fleet to other energy sources (e.g., electric vehicles), threaten to undermine fuel tax revenues. The figure below illustrates the relationship between fuel economy and fuel tax revenues on a per mile basis.

Per-mile revenue from 49.4 cents/gallon fuel tax, by vehicle MPG

At 20.5 MPG, the average Washington driver pays 2.4 cents/mile in state fuel tax

The prospects for improvements in vehicle fuel economy mean that there are likewise prospects for declining fuel tax revenue. This prospect motivated the Legislature to direct the Commission to study a transition from fuel taxes to a road usage charge system of collecting revenue from light vehicles, in order to stabilize funding for transportation.

Background: the Road Usage Charge Pilot Project in Washington State (1)

In Spring 2012, the Washington State Legislature's 2011-2013 Supplemental Transportation Budget contained a proviso directing the Washington State Transportation Commission to investigate the feasibility of transitioning from the fuel tax to a road usage charge. A year later, the Legislature expanded the Steering Committee's scope to develop detailed Operational Concepts, examine policy issues more deeply, and perform a business case evaluation. In December 2013, the Steering Committee concluded that a business case exists to pursue further study of road usage charging.[1]

In Spring 2014, the Legislature directed the Steering Committee to:

1. Consider alternative strategies for transitioning from fuel taxes to road usage charging;

2. Update the business case analysis;

3. Develop a Concept of Operations (ConOps) based on preferred Operational Concepts;

4. Consider the issue of how to assess motorists from other states under a road usage charge;

5. Answer questions about the relative equity of road usage charges on rural versus urban drivers;

6. Explore legal issues surrounding existing and potential future motor fuel tax bonds.

This document summarizes item 3 above. The 2014 Steering Committee final report addresses the remaining topics.

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[1]Washington State Transportation Commission, "Washington State Road Usage Charge Assessment, Business Case Evaluation Final Report," January 7, 2014.

Background: Road Usage Charge Pilot Project in Washington State (2)

In July 2016, the Steering Committee and the Commission issued recommendations to move forward with a pilot project to evaluate a road usage charging program in Washington State. The ConOps has been re-scoped to meet the following Pilot Project's objectives:

► Evaluate the technical and operational feasibility, and viability of the RUC system

► Examine the revenue potential and benefits of the new system compared with gas tax revenues

► Understand different costs associated with the RUC program

► Test an open system design that is technology neutral and allows entry of multiple Operational Concepts and technologies

► Test interoperability of RUC system with that of neighboring states and Canada

► Demonstrate ability to handle data securely and protect privacy of RUC Payers

► Provide pilot participants with choices regarding Operational Concepts and mileage reporting technologies

► Determine level of public acceptance of the RUC concept.

► Evaluate user-experience and response to different Operational Concepts and mileage reporting technologies

► Assess viability and cost-effectiveness of each Operational Concept through measurable outputs

► Understand operational aspects of the program; identify corresponding issues and provide a quantitative base for recommendations

► Demonstrate transparency/auditability of system

Policy Direction: Guiding Principles

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 road usage charge 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	A road usage charge system should consider consumer choice wherever possible.
Interoperability and Cooperation	A road usage charge system should strive for interoperability with systems in other states, nationally, and internationally, as well as with other systems in its own state. 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.

Policy Direction: Stakeholders in the RUC Ecosystem

► **Pilot Participants.** Pilot participants are the individuals enrolled in the pilot project for whom road usage charges will be computed for the miles traveled by their enrolled vehicle(s). Pilot participants will receive a receipt or an invoice for road usage, but only selected pilot participants testing financial interoperability will be required to pay real money.

► **RUC Administration.** For the pilot, this entity will be tasked with carrying out the enrollment of pilot participants, collection and processing of their road usage charges.

► **The RUC Interoperability Administration.** This administrative entity will be in charge of preparing and distributing interoperability reports to participating jurisdictions and perform financial reconciliation between jurisdiction participating in the interjurisdictional sub-pilot.

► **Washington State Transportation Commission (WSTC).** WSTC was tasked by the Legislature to lead investigations into road usage charging.

► **Washington State Department of Transportation (WSDOT).** As with fuel taxes, WSDOT would be the recipient of a considerable portion of road usage charge revenues and hence has an important stake in the design, implementation, and operations of a road usage charge system.

► **Washington State Department of Licensing (DOL).** DOL collects fuel taxes and performs vehicle registration and titling processes, so DOL could play a primary role in the implementation and operation of a road usage charge system. DOL's vehicle registration and titling processes are essential to identifying vehicles subject to a road usage charge.

► **DOL Agents/Subagents.** DOL subagents could expand their current role in licensing and registration to take on some of the functions of setting up accounts and collecting payments.

► **Interoperable jurisdictions.** Domestic and international jurisdictions testing various components of interoperability, including technical requirements, methods of clearing financial transactions and reporting standards with the Washington Pilot would share data

about miles driven by their residents, and would receive interoperability reports, reports of road usage charge and fuel tax credits collected for interoperable pilot participants driving on the road network; when financial interoperability is tested (with the Oregon program, OReGO), funds collected from the OReGO participants for miles driven in any jurisdiction will be remitted to the Oregon Pilot administration. Participating entities will submit their data for a financial reconciliation process, and net funds due to a jurisdiction will be deposited via the RUC Interoperability Administration. Participating entities from interoperable jurisdictions have an important role in providing feedback to the Washington Pilot and ensuring that interoperable charges are correctly calculated and accounted for.

► **Equipment Suppliers and Commercial Account Management Entities.** Private companies will at a minimum provide the technology and systems to implement the road usage charge, and potentially offer account management services.

► **Citizen Interest Groups.** Citizen groups representing various causes, such as the environment or electric vehicle owners will be interested in ensuring that the road usage charge supports the state's environmental goals and other goals of those organizations.

Operational Concepts for Road Usage Charge Collection

This ConOps summary includes the following Operational Concepts chosen by the Steering Committee:

> ► Operational Concept A – Mileage Permit;
> ► Operational Concept B – Odometer Charge; and
> ► Operational Concept C – Automated Distance Charge.

For each Operational Concept, the briefing book describes the experience of the pilot participant and the Account Managers (AM) operating the Operational Concepts. When relevant, the briefing book also describes the role played by the pilot team (the combination of state officials and consultants monitoring the pilot). A brief description of the technologies supporting the Operational Concepts is also provided.

The descriptions in this briefing book are summary, high-level descriptions—not all details are included in the descriptions here.

Technologies supporting the operational concepts

Operational Concepts A and B: Odometer reading capture

If the participant signs up for operational concepts A or B, they have the option to use either the personal mobile phone version or the DOL subagent version of the odometer capture application.

With the personal mobile phone version, the participant receives instruction on how to install the app or use the MMS (text messaging) system. Once the phone is set up, the participant is instructed to take a photo of the VIN (Vehicle Identification Number) and odometer, and submit them via the phone. After the initial transmission, the participant must submit new photos of the odometer, once every 3 months.

If the participant signs up for the DOL subagent version, the participant has one month to go to any of the selected subagents for the initial odometer reading. At the subagent's retail counter, the participant is provided a camera phone and instructed how to use it. The subagent also records the odometer reading from the picture taken by the participant using the subagent's phone. The participant will need to report odometer readings in the same manner every three months and visit the DOL subagent one final time at the end of the pilot.

Operational Concept C: Automated mileage reporting

Two technologies are selected for Automated Distance Reporting. This page provides a brief summary of the participant's experience for each technology supported.

1. **OBDII device**—the pilot participant receives the OBDII device in the mail. The pilot participant then installs it their vehicle's OBDII port using the provided instructions. The participant may call the helpline at any time.

2. **Smartphone Location Application**—the Automated Distance Charge via smartphone uses a photo of the vehicle's odometer as a backup or verification of mileage driven, but the smartphone app determines when the participant is driving out-of-state. The smartphone must be in the car, powered on, and paired with vehicle, for example using Bluetooth.

Note: The Smartphone Location Application was originally designated as the fourth Operational Concept. It has been reclassified as one of three possible technologies to support the Automated Distance Charge, the others being OBDII device. The human-interface design and engineering principles underlying a Smartphone Location Application optimized for the road usage pilot project were defined during the Smartphone Innovation Challenge, a structured development effort led by D'Artagnan with the University of Washington from January to June 2017. These design and engineering principles will be integrated in the new Smartphone Location Application that will be developed for the pilot project.

Participant enrollment

After being selected for the pilot project, the participant is invited to enroll in the pilot and set up a WARUC account with the RUC Administration through an online form provided by the project team.

Credentials for access to on-line WARUC account services will be managed through a program-wide single sign-on. This design allows the pilot participants to provide their contact details and a password to set up their WARUC account only once. After their WARUC account is set-up, pilot participants can choose one of the two Account Managers and register their vehicle(s) with the operational concept for which their vehicle is eligible.

Role of the Pilot Team

The pilot team is responsible for making sure that: all participants are signed up with an account manager; all three operational concepts can be acquired using the project website; and every vehicle has enrolled in an Operational Concept. The pilot team is also responsible for testing that the account manager is complying with pilot project requirements. The pilot team analyzes the pilot project reports sent by the account managers.

Role of the account managers

Account managers are responsible for: managing participant accounts—support account creation, modification, and deletion; providing a customer line for participants having issues with their account set-up or operational concepts; reporting issues and pilot data to the pilot team.

Operational Concept A: Mileage Permit

Pilot Participant Perspective

To acquire a Mileage Permit, the participant will select a Mileage Permit from an account manager. The Mileage Permit can be acquired on the account manager's project website, or alternatively, over the phone. The participant will be required to record and send an initial official odometer reading within one month of choosing a Mileage Permit. Odometer readings can be obtained via a mobile phone application that captures and validates odometer readings or by a DOL sub-agent (representative authorized to take official odometer readings).

At the time of permit acquisition, the participant is notified of the reminders that will be sent (typically by e-mail when the self-reported odometer readings indicate that the mileage limit will be reached)

Once the permit is set up, the participant drives and self-reports odometer readings via a mobile phone application or via a web form according to the required reporting schedule agreed with the account manager, until a reminder comes to set up a new permit before the mileage limit of the current permit is reached. Once that reminder comes, the participant acquires a new permit or if the participant forgets to get a new one, receives more reminders after the permit is expired.

Account Management (AM) Perspective

> ► Send reminders to increase initial compliance; and similarly, send reminders if participants let the Mileage Permit expire without acquiring a new permit.

Operational Concept B: Odometer Charge

Pilot Participant Perspective

To acquire an Odometer Charge permit, the participant will select the operational concept from an account manager. The pilot participant registers for the Odometer Charge concept online or by phone.

The pilot participant provides an initial official odometer reading to the account manager and self-reports actual miles driven at the end of each invoicing period (every three months). Odometer readings can be obtained via a mobile phone application that captures and validates odometer readings or by a DOL sub-agent (authorized representative to take official odometer readings).

The account manager will issue an invoice based on the actual amount of driving (end odometer reading minus start odometer reading for the period multiplied by per mile rate). All miles will be offset for fuel taxes paid based on EPA combined city-highway MPG for the vehicle.

Account Management (AM) Perspective

► Test that the mobile phone technology solution complies with all requirements, and verify that DOL agents know how to use the technology and can assist participants appropriately.
► Manage all participant's data received through the mobile phone technology or through the DOL subagents; and ensure that all participants receive reminders to take pictures from the mobile app provider or through the DOL subagents assistance solution.
► Send reminders to increase initial participant compliance; and send reminders if participants do not submit their odometer readings at three month intervals.

Operational Concept C: Automated Distance Charge

Pilot Participant Perspective

The pilot participant chooses the Automated Distance Charge from an account manager and sets up the mileage reporting technology (plug in the OBDII device; or sets up the mobile phone app). The pilot participant receives a RUC invoice once a month. For OBDII devices, pilot participants may also opt-in to use value added services.

Account Management (AM) Perspective

► Manage participant accounts—support account creation, modification, and deletion
► Distribute OBDII devices to participants; or distribute mobile phone software
► Process mileage data from OBDII devices, mobile phone
► Provide value added services where offered and available
► Provide invoices to participants

Introduction to Usage Scenarios

The following usage scenarios describe specific events that will occur in the lifecycle of the pilot. The following scenarios are described:

- ► Pilot Participant Sign up—Enroll a Pilot Participant
- ► Pilot Participant Sign up—Enroll a New Vehicle
- ► Change Operational Concepts
- ► Road Usage (Driving)
- ► Calculate Road Usage Charges
- ► Provide RUC Invoices
- ► De-enrolling a vehicle from the pilot
- ► Encourage compliance
- ► Manage Failure Conditions

Each scenario contains the following sections, except for compliance and failure conditions, which are structured slightly differently.

1. **Context**—brief summary of what is happening

2. **Pilot Participant Activities**—what actions the pilot participant takes during the scenario

3. **Pilot Team Activities**—what actions the pilot team takes during the scenario

4. **Account Management (AM) Activities**—what actions the account manager takes during the scenario

Usage Scenario: Pilot Participant Sign up—Enroll a Pilot Participant

Context: Once pilot participants have chosen to enroll in the pilot project,[2] they should be able to easily provide any needed participant demographic data, and complete any needed information releases and participant agreements. Then, they should easily be able to learn about: the road usage charging program; what vehicle models and model years are liable for the charge; the available account management and mileage reporting options. Finally, they should easily be able to sign up for their preferred Operational Concept for each vehicle that they enroll in the pilot.

Pilot Participant activities: After being recruited, the volunteers need to agree to participate: they should provide any needed participant demographic data, and complete any needed information releases and participant agreements. Then pilot participant must learn about the road usage charge program through the website or by calling the pilot participant helpline. The pilot participant then sets up a WARUC account, selects an account manager and signs up for their preferred Operational Concept (or Concepts, if they enroll multiple vehicles).

Pilot Team activities:

> ► Design and keep up-to-date a user-friendly website with an easy-to-use volunteer signup form (including information requests, information releases, and a participant agreement), as well as complete information on how the program operates.
> ► Operate a road usage charge pilot participant helpline telephone service.
> ► Provide a web-based means of signing up for all Operational Concepts.

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[2] This Usage Scenario covers the enrollment step after participants have been recruited for the project.

Usage Scenario: Pilot Participant Sign up—Enroll a New Vehicle

Context: A pilot participant enrolls one or several vehicles in the road charge pilot

Pilot Participant activities:

Once pilot participants have chosen an Operational Concept for their vehicles, they need to enroll each vehicle and set up an account with an account manager. If the pilot participant chooses Operational Concept C (Automated Distance Charge), they must obtain a mileage reporting device from the account manager to be installed in the vehicle.

Account Management entity activities:

The Account Management (AM) entity will set up a new account for any pilot participant that opts for Operational Concept A, B or C and selects the account manager as its service provider.

The account manager records the vehicle information and associates it with the Operational Concept chosen by the pilot participant. For Operational Concept C, the account manager provides a mileage reporting device to the pilot participant if the participant does not use a smartphone application.

Usage Scenario: Change Operational Concepts

Context: This scenario occurs when an existing pilot participant decides to change their Operational Concept.

Pilot Participant activities: Submit request to the current account manager to change Operational Concepts. Perform any closeout activities required by the account manager. Sign up for new Operational Concept, repeating many of the same activities required during initial enrollment.

Pilot Team activities:

► Approve procedures account managers will use when processing change of Operational Concepts;

Account Management activities:

► Provide a method for official odometer readings (by DOL subagents and/or mobile phone app) if desired;
► Perform accounting associated with changing Operational Concepts, including recording odometer readings as necessary;
► Send final invoices for Operational Concept B and C;
► Un-enroll participant from old operational concept;
► Enroll pilot participants with new operational concept.

Usage Scenario: Road Usage (Driving)

Context: The participant drives, and mileage traveled is recorded for the pilot participant's enrolled vehicle.

Pilot Participant Activities

► The pilot participant's vehicle is used on the road network.

► Pilot participants using Operational Concept C with devices on which location data is always being registered are not charged for driving out of state[3] or on private in-state roads.

► Pilot participants on Operational Concept C with devices that allow location data to be switched on and off must ensure that their GPS location data is enabled so that they will not be charged for driving out of state[4] or on private in-state roads.

Account Management (AM) entity activities:

► Receive and process road usage data from the mileage reporting devices.

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[3] Pilot participants opting in to this aspect of the pilot test, Participants who drive into Oregon or British Columbia will be invoiced for mileage driven within those jurisdictions at the road usage charge rate set by those jurisdictions, as part of the interoperability testing of this pilot project. Actual money will be paid or owed to Oregon Department of Treasury only for financial interoperability tests with the OReGO program.
[4] See footnote 2 above.

Usage Scenario: Calculate Road Usage Charges

Context: This scenario addresses how road usage charges are calculated.

Pilot Participant Activities: None

Account Management Activities:

► Operational Concept A: Not applicable – all pilot participants enrolled in Operational Concept A (Mileage Permit) pay the same per-mile fee. The cost of the permit is computed by multiplying the per-mile rate by number of miles on the permit.

► Operational Concept B: The account manager computes the charge by multiplying the distance traveled since the last odometer reading by Washington's per-mile rate. Charge calculation/invoicing is expected every 3 months. Operational Concept B accounts for fuel taxes by assuming that the EPA combined city/highway fuel economy for the vehicle is achieved, on average, for all miles. The amount of fuel taxes on this presumed fuel usage is calculated and then credited against the per-mile rate in computing the RUC amount owed.

► Operational Concept C: The RUC charge is computed as follows:
  > Calculate number of taxable miles by state for states participating in the pilot by removing any nontaxable mileage (e.g. private road) from miles driven on those states.
  > Calculate (if applicable data is available) or estimate fuel gallons consumed in each state. Estimated fuel consumption will be based on EPA combined city/highway fuel economy for the vehicle.
  > Multiply the number of taxable miles in each state where RUC is owed by the per-mile rate in each state; and the fuel gallons consumed in each state by the state fuel tax rate
  > Sum up road charges owed and fuel tax credits earned
  > The total amount owed by the participant is equal to the total RUC owed for each state minus the total fuel tax credits earned in each state.

Usage Scenario: Provide RUC Invoices

Context: The pilot participant is invoiced according to the operational concept selected.

Pilot Participant and Account Management activities:

► Operational Concept A (Mileage Permit): The account manager issues a receipt to the pilot participant for the entire amount due for the Mileage Permit when the pilot participant signs up for Operational Concept A and upon renewal.

► Operational Concept B (Odometer Charge): The account manager invoices the amount due after the pilot participant sends the odometer reading at the end of each invoicing period.

► Operational Concept C (Automated Distance Charge): The account manager invoices the pilot participant periodically (monthly) on the mileage driven in the prior period.

Usage Scenario: De-enrolling a Vehicle

Context: A participant wishes to withdraw from the pilot or to de-enroll his vehicle(s) from the pilot. The participant is responsible for notifying the Project Team or the account manager.

Pilot Participant activities: The participant has to notify the account manager and/or the Pilot Team or the account management entity at the time of the de-enrollment event (change of vehicle enrolled in pilot, vehicle sale, out-of-state transfer, theft, or destruction). If possible, report final odometer reading.

Pilot Team activities: Process de-enrollment requests from participants and from account managers. Ensure the participant is sent a final invoice (for operational concepts B and C). In case of change of vehicle requests, ensure that participant can add new vehicle to pilot smoothly.

Account management entity activities: Process de-enrollment requests from participants. Ensure the participant is sent a final invoice (for operational concepts B and C). In case of change of vehicle requests, ensure that participant can add new vehicle to pilot smoothly. If supported by the account manager, the new vehicle and old vehicle may be able to be handled on the same invoice during the period of vehicle change.

Usage Scenario: Encouraging compliance

Compliance activities involve analyzing data to detect cases of non compliance, contacting participants to understand the reason for non-compliance, and encouraging participants who are found to be non-compliant to abide by pilot processes, rules and regulations. Compliance activities vary by operational concept:

1. **Operational Concepts A and B:** Compliance includes observing periodic trends in reported odometer readings and verifying that official odometer readings are in line with Mileage Permits and Odometer Charge permits acquired. If the project team discovers an inaccurate odometer reading, the participant is requested to send a valid odometer reading.
2. **Operational Concept C:** Compliance mainly involves ensuring that the participant has installed the mileage reporting device properly, monitoring activity via data sent by the mileage reporting device, including reported mileage along with any alerts sent by the mileage reporting device (e.g., that the device was disconnected or physically tampered with). For participants using the smartphone method, compliance is monitored by comparing periodic official odometer readings against data reported by the phone app.

Usage Scenario: Manage Failure Conditions

The pilot will test the reliability of the RUC system and will therefore manage failure conditions of road charging detecting/reporting technology.[5] Mileage reporting hardware should include diagnostics to indicate failure conditions. The RUC Administration system should have a self-evaluation function that displays key performance indicators on a dashboard. When failures occur, the system should be able to continue functioning, albeit in a potentially degraded manner. The failure conditions included here represent the most likely possibilities. As-yet unknown failure possibilities may also exist.

Operational Concept A (Mileage Permit): No known failure conditions.

Operational Concept B (Odometer Charge):

- ► Odometer failure: Participant should report odometer failure, use last officially recorded mileage, plus an amount extrapolated from previous driving data.
- ► Unintentional reporting of wrong mileage: The account manager should detect quickly, request that the participant re-enter mileage data.

Operational Concept C (Automated Distance Charge):

- ► Mileage recording device loses communications or defective device—The account manager should replace promptly.
- ► Smartphone app failure: The account manager should request that participants send their odometer reading through a web form as an alternative, until the issue is resolved.
- ► Failure at account management system—all systems should have frequent data backups and redundancy built in.

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[5] Other organizational/administrative failures are also possible—the scope of this section is limited to mileage detection/reporting technology.