



# STATUS REPORT: WASHINGTON STATE ROAD USAGE CHARGE PILOT PROJECT (STAGE 1)

WASHINGTON STATE  
TRANSPORTATION COMMISSION

July 26, 2017



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D'Artagnan Consulting, LLP

# TOPIC OVERVIEW

- 2017 RUC updates: legislative, federal, other states,
- WA RUC Pilot Project status report
- Highlight two important milestones:
  - Selection of private firms to provide RUC services during the pilot
  - Results of Smartphone Innovation Challenge
- Upcoming pilot project activities (August through November, 2017)

# 2017 UPDATES

# WASHINGTON STATE LEGISLATIVE UPDATE

## State appropriation of federal FAST Act grant funding:

- \$550,000 appropriated in 2015-17 Supp. Transportation Budget (expired June 30, 2017)
- Remaining \$3,297,000 appropriated in 2017-19 Biennial Transportation Budget (expires June 30, 2019)
- Reimbursable grant funds – WSDOT pays with their own allotment of federal funds, then requests reimbursement from FHWA for authorized RUC project expenditures

## Legislative interest in addressing outstanding policy issues (“parking lot”):

- Concern expressed that policy, legal and fiscal questions are piling up and not being addressed yet
- Response: WSTC’s Round 2 federal grant proposal seeks funding to fully research and analyze all 18 issues that have been identified by the Steering Committee. Policy analysis to be complete and included in Final Report.

# WASHINGTON'S ROUND 2 STSFA GRANT PROPOSAL

## Background:

- Federal FAST Act provided \$95 million over 5 years for the Surface Transportation System Funding Alternatives Program, administered by FHWA
- Washington's Pilot Project was fully funded for Stage 1 (Final Design & Set-up)
- Remaining funding request is for Stage 2 (12-month live pilot) and Stage 3 (evaluation and reporting): \$4.6 million

## Summary of Round 2 Proposal:

- Added: mileage permit (removed time permit)
- Added: development and utilization of a model Privacy Impact Assessment (PIA) for RUC
- Added: participation from Idaho drivers to expand the range of jurisdictions participating in the pilot (now includes: active RUC states, other countries, non-RUC states, and WA)
- Added: requirement to complete policy analysis for all 18 policy "parking lot" issues identified by the Steering Committee

# UPDATE ON RUC IN OTHER STATES

Jeff Doyle, D'Artagnan Consulting

# CALIFORNIA ROAD CHARGE PILOT PROGRAM

- 9-month pilot completed in March 2017
- 5,000+ vehicles testing 8 mileage reporting methods reported 35+ million miles
- 50+ heavy vehicles tested per-mile charge as a replacement for state diesel excise tax
- Survey results
  - At end of pilot, 85% of participants satisfied or very satisfied overall
  - The number “very satisfied” increased from 37% before the pilot to 61% after the pilot
  - At end of pilot, 73% believe a per-mile road charge is a fair way to pay for road use
- Next steps:
  - California Legislature passed a package of fuel tax and registration fee increases in April
  - California State Transportation Agency final report due to Legislature this year
  - California Transportation Commission road charge recommendations due this year
  - Caltrans will use federal grant for public engagement on transportation funding, organizational design of a road charge with other state agencies, and exploration of a pay-at-the-pump option for road charge

# OReGo: OREGON'S OPERATIONAL RUC PROGRAM

- Two year operational anniversary on July 1, 2017 and reported "*the system works*"
- 731 RUC-paying vehicles enrolled as of July 25, 2017
- OReGo provides choice of state account manager or commercial account manager, adding one commercial account manager and losing one since launch
- Majority of Oregonians in 2016 survey agreed a mileage-based system for road funding is fairer than fuel tax, registration fees or vehicle sales tax
- ODOT researching adding embedded telematics, cell phone imagery and data aggregation as reporting options
- 2017 Oregon Legislature enacted an "enhanced vehicle registration fee" that increases proportionately with MPG. However, EVs that opt to pay RUC are exempt from the fee.
- 2016 STSFA Round 1 funding allows OReGo to *expand* technology options, improve account management and bolster public outreach
- ODOT applied for 2017 STSFA Act grant to add congestion pricing element to OReGo per legislative directive



# OTHER STATES

## States with RUC pilots/activities:

- Colorado conducted a small scale RUC pilot (~100 participating VIPs)
- Minnesota: examining how mobility-as-a-service (MAAS) affects RUC

## RUC West regional pilot:

- Active states and observer states
- Planning activities only; intended pilot launch: mid-2019 (if funded)
- Oregon and California are primary leaders; Colorado may join.

# STATUS REPORT ON PILOT PROJECT PREPARATIONS

Jeff Doyle, D'Artagnan Consulting

# STAGE 1: FINAL DESIGN & PILOT PROJECT SET-UP

## Pilot Project Stage 1:

- Fully-funded (federal STSFA grant, in-kind, toll credits)
- Includes all work leading to launch of live pilot test

## Work is organized around four major task areas:

1. Pilot Design & Set-up
2. Comprehensive Public Attitude Assessment
3. Public Communications & Participant Engagement
4. Policy Development, Oversight & Project Management

# TASK 1: PILOT DESIGN & SET-UP

## Completed and nearing completion:

- ✓ Technical documents (SRS, ICD, ConOps)
- ✓ Procurement of RUC Service Providers (i.e., account managers and technologies)\*
- ✓ Smartphone Innovation Challenge\*
- Constructing the multi-jurisdictional RUC clearinghouse function (Hub)\*

## To be completed by mid-November:

- Help desk and participant support
- Partnerships with DOL agents/subagents to provide in-person odometer verification
- Finalize the pilot evaluation plan

## Scheduled for later:

- Organizational Design (potential roles for government, private sector in a future RUC system)

\* = covered in more detail in later slides

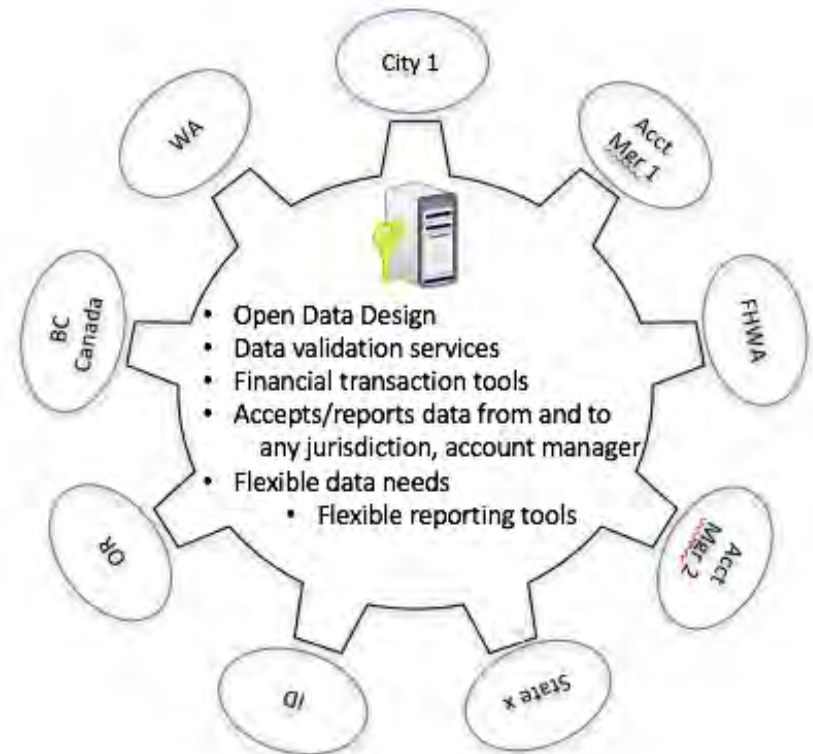
# RECONCILING RUC CHARGES AMONG MULTIPLE JURISDICTIONS

## The RUC Hub:

A centralized clearinghouse that collects mileage data reported by RUC Account Managers to determine return-to-source revenue distributions to jurisdictions where miles were driven

### Key features:

- Any jurisdiction that collects a RUC can participate
- Unless the jurisdictions agree otherwise, all RUC collections remain under the control of the driver's home-state account manager
- Governed by a board of public-sector agencies
- Most similar to: IFTA (fuel tax administrator for interstate trucking)



# TASK 2: COMPREHENSIVE PUBLIC ATTITUDE ASSESSMENT

## Completed:

- ✓ Baseline public attitude survey
- ✓ Focus group sessions (in five regions of the state)

## Up next:

- Analyzing results from survey and focus groups, and synthesizing findings in a full report

## Scheduled later:

- Baseline attitudes of pilot project participants, before beginning the 12-month live test

# TASK 3: PROJECT COMMUNICATIONS & PARTICIPANT ENGAGEMENT

## Completed:

- ✓ Basic PowerPoint presentation (general audiences, 10 minutes or less)
- ✓ WA RUC Project Style Guide
- ✓ Pilot Project Fact Sheet
- ✓ Media response protocols
- ✓ Draft Communications Plan
- ✓ Draft Recruitment Plan

## In Progress:

- 1:1 Listening Sessions

## Upcoming:

- Web site changes to support recruiting phase
- New materials to support participant recruitment and enrollment (video, social media, etc.)

# TASK 4: POLICY DEVELOPMENT, OVERSIGHT & PROJECT MANAGEMENT

## Ongoing:

- Refinements to Policy Issue Work Plan
- Monthly project status reporting (WSTC)
- Quarterly project status and financial reports (FHWA)
- As-requested presentations (WSTC, Legislature)

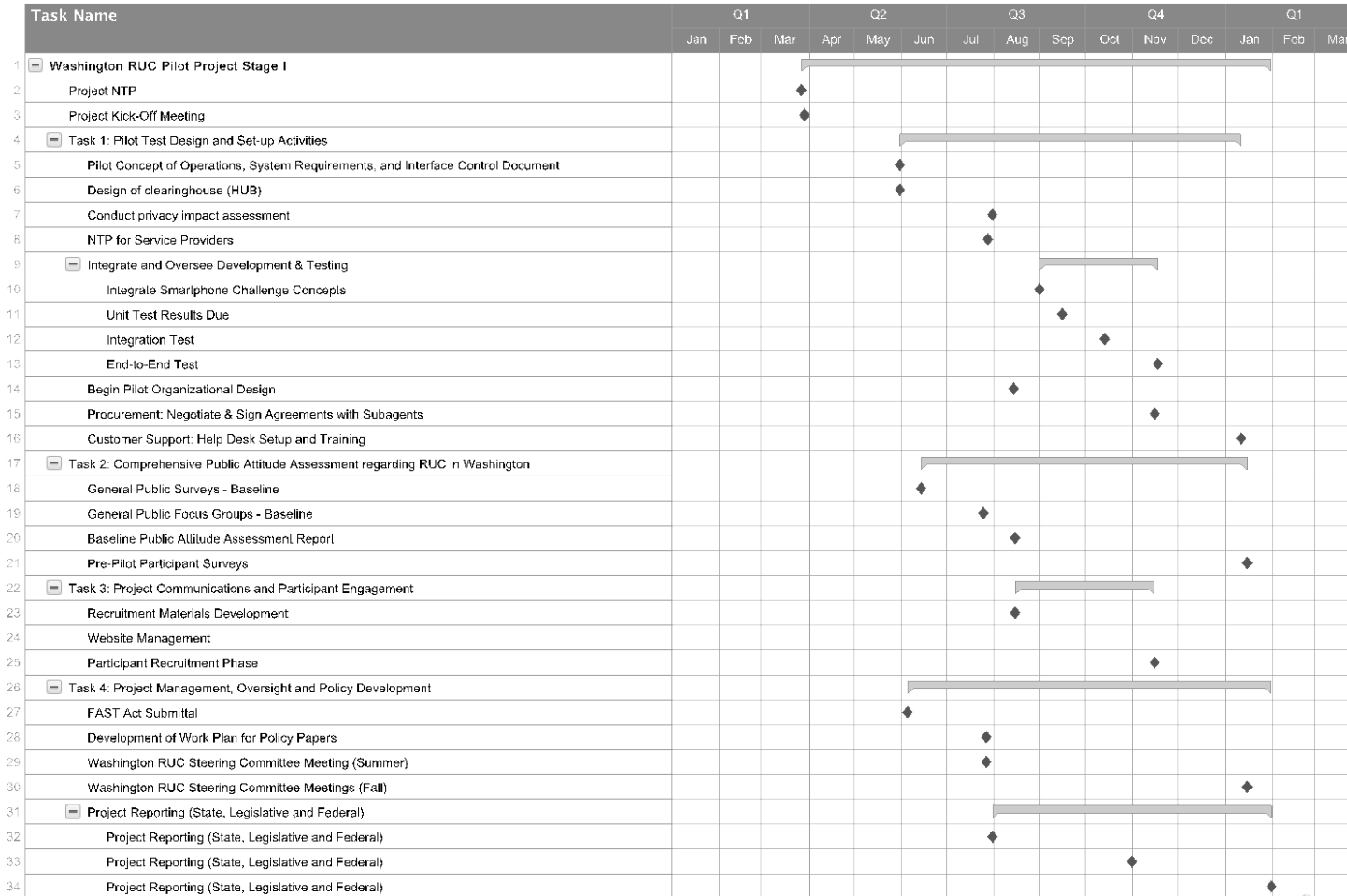
## Scheduled:

- Comprehensive policy issue analysis (federal funding pending)
- Steering Committee meeting: November 9, 2017



# SCHEDULE & MAJOR MILESTONES

## WA RUC Pilot Schedule Steering Committee Meeting



# INTRODUCTION OF RUC SERVICE PROVIDERS

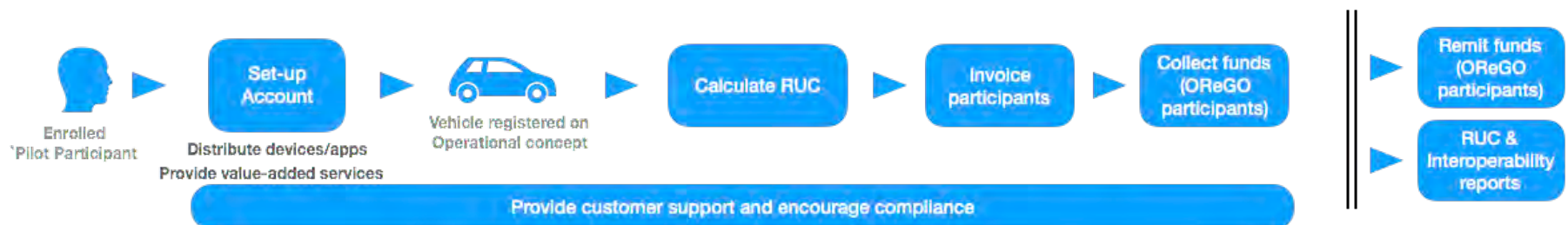
# THE ROLE OF RUC SERVICE PROVIDERS IN THE WASHINGTON PILOT PROJECT

## Provide end-to-end Account Management services

- Manage pilot participants accounts and provide on-going customer support
- Support and distribute mileage reporting technologies (devices or apps)
- Provide value-added services
- Calculate Road Usage Charges and provide RUC receipts/invoices
- Encourage compliance of pilot participants

## Report to the RUC Administration

- Remit funds (for OReGO participants)
- Provide periodic RUC and interoperability reports



# APPROACH TO RUC SERVICES

## Five Operational Concepts

- Two manual concepts:
  - Mileage Permit and Odometer Charge
- Three automated concepts:
  - Automated Distance Charge (location)
  - Automated Distance Charge (no location)
  - Smartphone Location Application

## Two Service Providers

- One Service Provider to cover all five concepts
- A second Service Provider to cover three of the five concepts

## “Single-Sign-On”:

Centralized WARUC pilot participant account with single-sign-on system.



*Participant enrollment  
(Single Sign On System)*



# RUC SERVICE PROVIDERS

## Shortlisted Service Providers with RUC experience

- Azuga
- emovis
- Intelligent Mechatronics Systems (IMS)



## Key features across proposals

- Certifications from previous RUC pilot projects
- Coverage of all operational concepts
- Support reliable mileage reporting technology for automated concepts
- Use of mapping technology that differentiates between private and public road networks

# SERVICE PROVIDER: AZUGA

## Key features

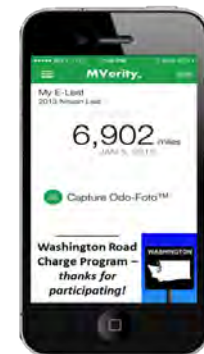
- Integrated Azuga RUC Platform
- Digital Wallet system
- 8 UBI oriented value-added apps for end-users
- Google maps or HERE maps



## Technology providers

- Danlaw (Azuga) OBDII device
- Vehcon MVerity odometer capture app

azūga®



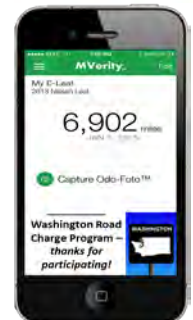
# SERVICE PROVIDER: EMOVIS

## Key features

- Modular open platform
- 24 UBI oriented value-added apps for end-users
- OpenStreetMap for public/private road differentiator

## Technology providers

- Automatic OBDII device (with location)
- IMS OBDII device (no location)
- Vehcon's MVerity odometer capture app



# SERVICE PROVIDER: IMS

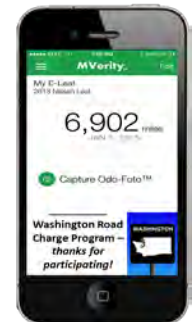
## Key features

- Modular open platform
- 10 UBI oriented value-added apps for end-users
- OpenStreetMap or HERE map for public/private road differentiation



## Technology providers

- IMS OBDII device
- IMS odometer capture app
- Vehcon MVerity odometer capture app





# SMARTPHONE INNOVATION CHALLENGE

# SMARTPHONE CHALLENGE BACKGROUND

## Why a crowd-sourced approach to providing a smartphone app for RUC?

- There's no strong business case for a private firm to develop an app that taxes drivers by the mile – at least not currently.
- Past efforts to use smartphones for active mileage recording have been disappointing.
- A crowd-sourced approach is more likely to give greater weight to consumers' needs and preferences than a traditional, government-issued "build to spec" solution.
- Codefests and "hackathons" are extremely cost-effective.



# THE SMARTPHONE CHALLENGE: PROBLEM THAT MUST BE SOLVED

*Can IT engineers, software developers and designers create a prototype solution (software or device) for mileage reporting by **smartphone**?*

- Allows drivers to use their own smartphone to record and report mileage
- Allows drivers to decide whether or when to enable location-based services (GPS)

**CoMotion** (UW organization that matches private industry with public research) helped support four research teams:



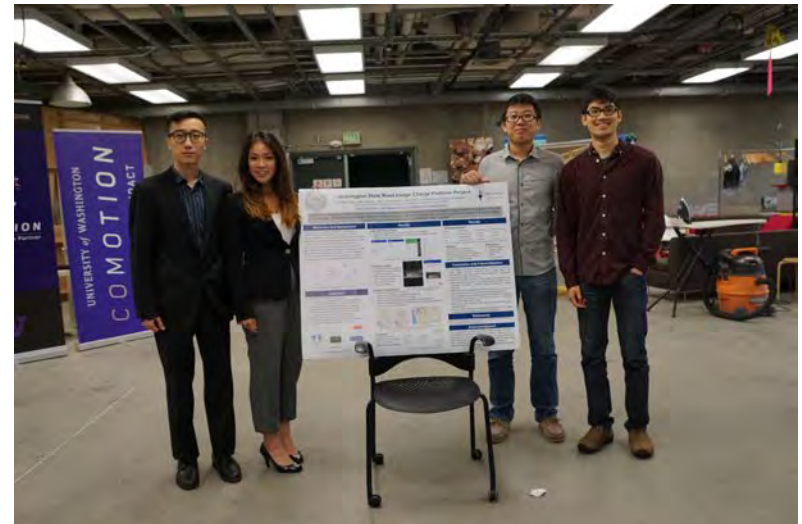
# UW ELECTRICAL ENGINEERING DEPARTMENT TEAM

Developed a smartphone app for the Android operating system



Primary innovative contributions:

- Toggle on/off location-based (GPS) mileage recording, to ensure out-of-state miles are deducted from a drivers' RUC account
- *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. Or, the driver can select "automatic" mode, where the app turns on out-of-state mileage deduction automatically when it detects a state border has been crossed.



# UW INFORMATION SCHOOL (iSCHOOL) TEAM

**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

Developed an iOS app: *WARUC*, now available in Apple's App Store

## Primary innovative contributions:

- Simple, "no-look" swipe on the smartphone screen to activate or deactivate mileage recording
- Full-functioning WARUC app available for download in Apple's App Store (free)



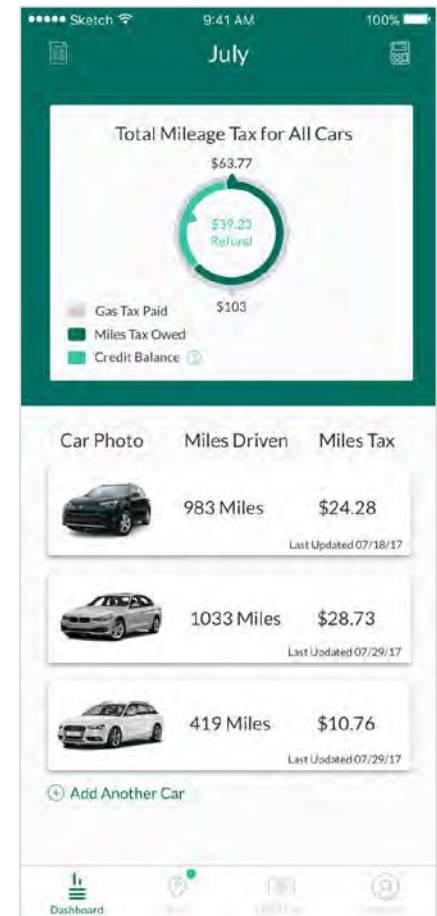
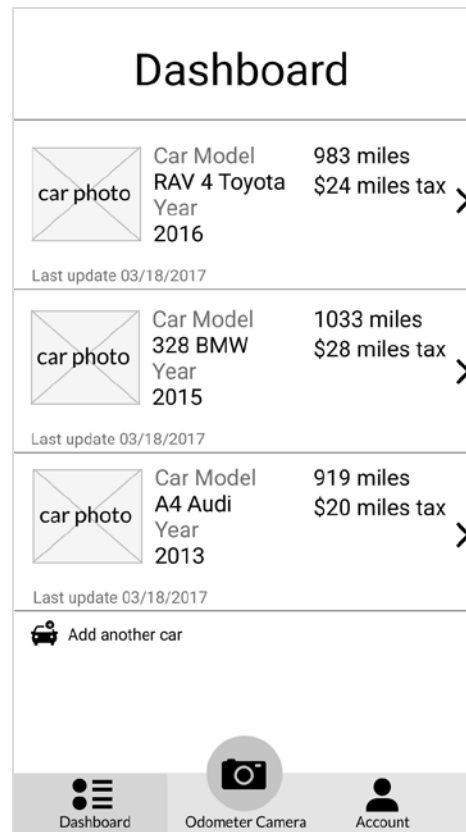
<https://youtu.be/Z49JwJyzac0>

# UW HUMAN CENTERED DESIGN ENGINEERING TEAM 1

Focused on smartphone app design  
that appeals to the average driver

## Primary innovative contributions:

- Extensive driver surveys (102 responses) and in-person interviews (8 people) to identify preferences of the average driver
- Clever “explainer video” to help drivers learn the primary reason for RUC, and how the smartphone app is used





# UW HUMAN CENTERED DESIGN ENGINEERING TEAM 2



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



### 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.

## 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 Fallien  
Michael Fernandes  
Alex Gilbert

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



Applied "Participatory Design" principles to balance individual preferences with revenue collection needs

**HCDE** Human Centered Design & Engineering  
University of Washington

Primary innovative contributions:

- Three interactive workshops with 8 volunteers guided all design choices
- Drivers can choose to categorize their trips to self-analyze (and economize) their driving habits
- Drivers can quickly and easily "*Contest this Trip*" through a drop-down menu, requesting their RUC account manager to fix any incorrect mileage

# PREVIEW OF UPCOMING ACTIVITIES



# UPCOMING PROJECT MILESTONES

## Stage 1 Milestones (August – November 2017)

- Decision by FHWA on Round 2 STSFA Grant Funding (funds live pilot, evaluation and reporting)
- Web site refresh
- Begin participant recruitment activities
- Provide active assistance to British Columbia and Idaho participants
- Testing of all devices, account services and customer interface/support
- Establish partnerships with DOL agents/subagents located near participants that choose in-person odometer validation method

# THANK YOU

Consultant support provided by:



enviroissues



PORTLAND | SEATTLE | WASHINGTON DC

