WASHINGTON STATE **ROAD USAGE CHARGE** ASSESSMENT

Pilot Project Implementation Plan Appendices

Prepared for Governor Jay Inslee and
Washington State Legislature

Washington State
Transportation Commission

Washington State
Department of Transportation

January 31, 2017

WA **RUC**

Consulting team:

WA **RUC**

Appendix A

Road Usage Charge Technology Survey

Prepared by D'Artagnan Consulting

WA RUC

Contents

Purpose of this Briefing

This briefing is intended to provide an overview of products, technologies, and development efforts that have emerged recently and that could support either a RUC pilot in Washington, or an operational system in the future. The briefing is organized into two major sections:

- Technologies and innovations that directly impact the Operational Concepts selected by the Steering Committee during earlier phases of RUC study.

- New technologies or innovation that supports additional Operational Concepts, now or in the future

The Steering Committee is not expected to make any decisions at this present time (September 30) about whether any of these emerging technologies should be mandated in the forthcoming Washington pilot project.

Updates on selected operational concepts

Key tenets recommended in any future Washington RUC system:

In its earlier work, the Steering Committee made the recommendation that any RUC system in Washington should have the following characteristics:

1. It should take an "open market" approach that allows services to be provided by any qualified firm—prevents technology lock-in and allows for innovation

2. It should allow private industry to provide account management services

3. It should allow consumer choice in how to report mileage, including an "opt out" option (flat annual fee instead of RUC)

Volunteers in the pilot test can choose among four options for reporting mileage

In its initial recommendations for the design of a RUC demonstration in Washington, the RUC Steering Committee identified four operational concepts to test. These are described below. The following pages of this briefing describe innovations and new technologies that support these four concepts.

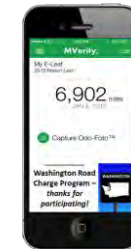**Time Permit**: flat fee to drive unlimited miles in a given period (month or year)

Odometer Readings: per-mile charge based on vehicle odometer

Automated Mileage Meter: in-vehicle device reports miles – drivers choose if they want GPS or not

Smartphone: app that uses driver's phone to record and/or report miles driven

No-tech   *Low-tech*   *Higher-tech*   *High-tech*

Time Charge

There have been few significant innovations related to the use of time permits in the pilot. One consideration relates to interoperability with other jurisdictions. The pilot program funded under STSFA[1] includes testing elements of interoperability with Oregon's OreGO program and the city of Surry, British Columbia. For non-Washington residents, short-duration (one week or 10-day) time permits may be desirable. In this case, the use of commercial account managers to handle these non-resident, short-term permits could be desirable. Such as system is currently being piloted in California.

Odometer Charge

The odometer charge concept currently assumes that there will be a visual inspection of the odometer during the annual vehicle licensing process. Staff in licensing agents' offices would record the odometer as part of the vehicle registration renewal process, and provide that data to DOL. This would require staff to leave their office to visually inspect the odometer. Maximizing the speed and efficiency of data collection while minimizing opportunities for data transcription error is critical for this option to be cost-effective and convenient for motorists.

Newly-commercialized mobile apps offer functionality that supports recording odometer readings quickly and securely, and could facilitate use of the odometer option with on-line vehicle registration renewals. One such app is MVerity by Vehcon.

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[1] The Surface Transportation System Funding Alternatives (Section 6020) grant program (STSFA) provides grants to States to demonstrate user based alternative revenue mechanisms that utilize a user fee structure to maintain the long-term solvency of the Highway Trust Fund. $15 million in FY 2016 and $20 million annually from FY 2017 to FY 2020 will be made available for grants for demonstration projects. These grants will make up no more than 50% of total proposed project costs, with the remainder coming from non-Federal sources. This grant is only available to States or groups of States and requires a State DOT to be the lead for purposes of receiving funds. Washington's RUC pilot successfully competed for funding under the STSFA program.

MVerity™ verified vehicle mileage for Road Charging

From the motorist's perspective, MVerity works by capturing a photo of the vehicles VIN plate and odometer readout at signup, with periodic odometer readings after that. The software could be installed on tablets or mobile phones issued to vehicle licensing office staff to facilitate odometer collection. Because all the image processing takes place on Vehcon's servers, end-users do not have to have a smartphone – old-style flip phones or tablets could be used.

Using the company's patented Odo-Foto™ technology:

- VIN and odometer photo is captured and transmitted with the driver's own phone
- Vehcon extracts and validates data using photo recognition technology, algorithms and data bases
- System can detect possible fraud by matching photos to a database of vehicle dashboards, and detecting digital manipulation

This solution also provides an alternative path to odometer charges for motorists. Rather than requiring odometer readings to be captured at a vehicle licensing office (or agent's office), it is possible that motorists could capture their own VIN and odometer data and submit it as part of the online renewal through a License eXpress account using their own mobile phone. Another possible benefit of the Vehcon system is the ability of motorists to periodically (monthly or quarterly) provide official odometer readings, in order to gauge, and potentially make adjustments to, their pre-paid RUC.

Automated Distance Charge

The OBD-II dongle technology that is proposed as the foundation of the automated distance charge reporting choice is among the most mature. There is little new functionality since the Steering Committee first discussed the mileage meters as a reporting option. Instead, development of the technology has focused on incremental improvements in performance such as:

- Migrating from 3G to 4G data transmission
- Improving component reliability, such as improved GPS chips, SIM cards, and on-board memory
- Reducing power requirements

Also, as a result of new regulations in California, beginning with Model Year 2019, all passenger vehicles sold in the U.S. will provide actual vehicle odometer and fuel consumption via the OBD-II port. Currently, only about 70% of vehicles provide the actual fuel consumption information.

The other area where vendors that offer automated mileage meters have invested significant development efforts is in the provision of value-added services to motorists. These include:

- Driver performance feedback
- Real-time trip logs
- Vehicle health information, such as emissions data or battery levels or diagnostic trouble code readout
- Geofencing tools (the vehicle notifies the owner if it leaves a pre-defined area)
- Many others

GPS Smartphone Concept

The GPS Smartphone concept is the least mature and least reliable of the four options at the present time. Most current implementations utilize the smartphone's GPS chip to determine location and miles driven. The obvious limitations are that:

1. The smartphone must be in the vehicle each time it is used

2. The smartphone must be powered-up at all times

3. If passengers are carrying smartphones (and are registered for a GPS smartphone RUC account), or if the driver carries more than one smartphone with the GPS smartphone app installed, or if the driver carries only one smartphone but drives more than one vehicle, the phone must be able to distinguish whether it is in the correct vehicle and whether it should be recording and reporting miles.

To address issues 1 and 2 above, the technology option adopted by the current Concept of Operations (ConOps) requires that periodic photos of the vehicle odometer be submitted through the app. This allows the account manager to "true-up" mileage not accounted for when the smartphone was not carried in the car, or when its battery was drained.

To address issue 3, the ConOps requires that the smartphone be tethered to the vehicle via a Bluetooth link to the vehicle. In this way, the smartphone is able to distinguish between vehicles and determine whether to count miles.

Most vehicle Bluetooth systems are able to support only one connection at a time, so motorists adopting this option would be unable to use, for instance, the hands-free calling function on their phone while driving. An alternative provider offers a solution that installs an OBD-II dongle in the vehicle, then forms a Bluetooth link between the smartphone and the dongle. This frees up the vehicle's Bluetooth connection for other uses (hands-free calling, music streaming, etc.), but prevents the driver from using the OBD-II port for other purposes (Usage-based insurance or in-vehicle wi-fi).

Recent entrants into the RUC smartphone market started by providing Usage Based Insurance (UBI) services. The focus of these apps is collecting data on driver behavior, particularly safety, and so location-based analytics (such as that required to determine taxable and non-taxable miles) tend to be underdeveloped.

GPS Smartphone Concept, cont.

Most of these apps face similar criticisms from their users:

- Drains [smartphone] battery

- Consumes too much data

- Requires GPS all the time

- "Loses" trips

- Crashes often

It is plausible that the absence of a large commercial market for reliable, consumer-friendly RUC apps has impeded their maturation. To this end, WSTC will host a Hackathon in Fall 2016, at which it will challenge developers to solve these problems and create a smartphone app to support RUC for Washington. Characteristics of the "ideal" smartphone app can serve as goals for the hackathon, and may be used to judge the winner. These characteristics include:

- Automatic trip detection – the app automatically starts when you start driving

- All trips are catalogued

- Precise mileage is captured – both taxable and non-taxable

- Calling/texting/data usage is not limited while driving (although one hopes the driver is not texting…)

- Very low (<10% per day) battery usage

- Means (such as password protection and data encryption) of protecting driver data on the phone and during transmission to the account manager

- Ability to toggle location-detection on and off

- Ability to support data collection for multiple vehicles

- Automatic activation by jurisdiction – app can be set to "activate" only when it detects the vehicle is outside its home jurisdiction (in this case, Washington)
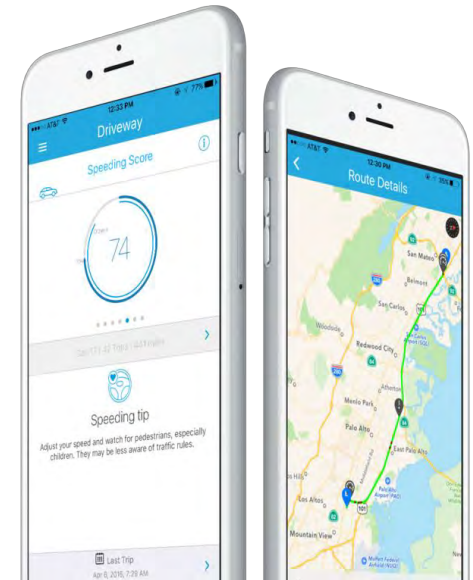
Additional technologies that could support road user charging in the near- to mid-term, but are probably not mature enough to include in the present pilot

Mature Technologies with Road User Charging Applications

In-vehicle telematics

In-vehicle telematics presents an interesting opportunity for automated collection of mileage data from motorists without the need to install or carry additional equipment. "Telematics" is an umbrella term that describes functionality arising at the intersection of wireless telecommunications and informatics. The OBD-II dongles used for automated mileage meters are a telematics application – the dongles are devices that provide the interface between a car's on-board computer and the RUC account manager using (typically) 3-G wireless communication.

In-vehicle telematics differ from OBD-II based solutions in that the interface to the car's engine control unit (ECU) and the wireless chip are embedded in the vehicle. Early implementations of in-vehicle telematics, like GM's On-Star, were developed and marketed primarily as safety applications. In recent years, telematics application development efforts have broadened to include "infotainment" applications such as streaming of audio and video, and enabling wi-fi hotspots in vehicles.

At least one commercial entity is developing interfaces between in-vehicle telematics and RUC account management services.

There is also a limited range of value-added services account managers would offer for customers reporting miles via in-vehicle telematics, since the telematics systems themselves already report vehicle health, safety-related vehicle data, travel history, and may offer geofencing.

Mature Technologies with Road User Charging Applications, cont.

Limitations of in-vehicle telematics

At the present time, the functionality of in-vehicle telematics is similar to automated mileage reporting without location data. While all in-vehicle systems have GPS capabilities, data transmission costs are a significant limiting factor to the use of in-vehicle telematics for location-based reporting (which distinguishes taxable vs. non-taxable miles, in-state vs. out-of-state). At the present time, telematics software is not designed for reporting RUC data, so each time an Account Manager wishes to get an odometer reading (or location), it must "ping" the vehicle. Each "ping" carries a cost, and pinging frequently enough to provide location-based services is currently cost-prohibitive. However, as data reporting and transmission protocols mature and data bandwidth expands under the proposed 5G telecommunications standard, location-based reporting (e.g. "GPS option") could become much more cost-effective.

It is also important to note that many OEMs offer telematics as a subscription-based service. So, there are a fair number of vehicles in the fleet that are telematics *capable*, but unless the motorist subscribes to the OEM's telematics service (On-Star, BMW ConnectedDrive, Ford SYNC), vehicle data is not available for RUC reporting.

Re-Emerging Concepts

Pay-at-the-Pump

In its 2006 RUC pilot project, Oregon tested a "Pay at the Pump" (PatP) concept via a system it called VMTCAR. Perceived benefits of a PatP system are protection of driver privacy, ease of payment, the ability for motorists to make small, incremental payments, and, at least for any amount of time the state continues to collect a motor fuel tax, built in enforcement. Oregon's PatP concept required equipment be installed in both the vehicle and the gas pump. At the conclusion of the pilot, the decision was taken not to pursue PatP in future demonstration projects due to relatively negative user feedback, technology issues, and capital costs of retrofitting both gas stations and private vehicles.

Since 2007, additional development of the PatP has occurred. One example is the concept set forth by Verdeva. Their concept places RFID tags on vehicles and RFID readers on gas pumps, and establishes an interface between the gas pumps point of sale system, state databases (such as DMV or DOL), and the Verdeva back office. Miles driven is estimated based on the volume of fuel purchased and the RUC balanced against any motor fuel tax levied at the pump. The difference is applied to the total due. Verdeva's technology is still at the proof-of-concept stage, and relies heavily on cooperation from gas station operators, as well as the ability of state databases to integrate with the Verdeva system. It also does not directly address the collection of RUC from EV drivers, since these drivers do not fill up at gas stations. Further, it does not differentiate between taxable and non-taxable miles, so it presents some challenges for interstate or international interoperability. However, it does present an operational concept that is familiar to motorists – paying your road use tax, whether it be a motor fuel tax or a road user fee – at the gas pump.

Zone-based Charging

A number of companies offer RFID-enabled zone-based charging. In essence, this is an expanded tolling network. While the concept may be feasible for assessing RUC on mainline facilities, it is impractical for local routes, because gantries must be mounted on every road where a charge will be assessed.

Evolving Technology

5G

A significant cost driver for operations of any of the technology-assisted RUC concepts is data transmission. The ability to send collected road usage information to account managers limits where and how often information is sent from the vehicle to the account manager. Additionally, many of the technology options available today – OBD-II dongles, smartphone apps, Bluetooth – require motorists to make tradeoffs. If they adopt an OBD-II mileage meter, they may not be able to purchase usage-based insurance. If they pair their vehicle to a smartphone via Bluetooth, they may not be able to use hands-free calling or stream music.

5G simply refers to the mobile telecommunications protocol currently under development. It includes native support for device-to-device communications that will enable connections among multiple wireless in-vehicle and infrastructure-based sensors for the purpose of metering road usage, inside the vehicle and over wide coverage areas. What this means in practice is that mileage meters may no longer be necessary; vehicle engine control units can transmit mileage data directly to the account manager without routing through either an OBD-II dongle or telematics services.

5G has the potential to support a transportation utility ecosystem by allowing a single terminal to support multiple in-vehicle activities, including infotainment, navigation, vehicle-to-vehicle and vehicle-to-infrastructure safety applications (automatic braking, hazard avoidance), and cloud support for vehicle automation (including driver assist and "autonomous" functions).

Also, the projected very high reliability (>99.9%) and flexibility in radio spectrum use (5G devices will be able to seamlessly move between 3G, 4G, wi-fi, wi-max, and other frequencies) mitigates a significant challenge faced by current RUC systems utilizing 3G or 4G communications. At the present time, RUC participants who use an on-board device, whether it be based on OBD-II dongles, smartphone, or native telematics must store data and are only able to transmit when their devices are able to connect to the network. In areas with poor cellular coverage (rural areas but also dense urban areas where "urban canyons" interfere with radio signals) data are irregularly transmitted and data loss may occur. The improved reliability and coverage promised by 5G should mitigate this issue, particularly in urban environments.

Appendix B

Agency Roles in Pilot Project

Prepared by D'Artagnan Consulting, LLP with WSP/Parsons Brinckerhoff

WA **RUC**

Appendix B

1.   Introduction

This technical memorandum is a deliverable under Task 1.1 of the Washington RUC Pilot Implementation Plan. Task 1.1 requires identification of essential agency roles and responsibilities for the pilot project. This task contemplates potential agency roles in the pilot, including the Washington State Transportation Commission (WSTC), the Department of Licensing (DOL), the Washington State Department of Transportation (WSDOT), the Department of Revenue, and the Office of the State Treasurer. The recommended roles were developed based on a series of meetings with these agencies and feedback from their staff.

Since one objective of the pilot project is to provide these agencies with a forum for observing a simulated RUC system that could be implemented in the future, this memorandum also recognizes the unique experience and contributions these agencies can make in helping design a "real" RUC revenue collection system for the future.

The potentially interested or affected agencies all reviewed, edited and commented on the content and/or issues captured in this technical memorandum. Individual agency briefings and follow-up meetings were conducted from July through December 2016. In addition, larger group meetings (Interagency Consultation Group meetings) were held periodically, along with two separate Steering Committee meetings where WSTC, WSDOT and DOL all participated.

2. Executive Summary: Agency-by-Agency Roles in the Washington State RUC Pilot Project

The detailed explanations for each agency's role in the forthcoming pilot project can be found in the Organizational Design tables contained in Section 4 of this memorandum. Below are summary level descriptions of each agency's expected interest or role in pilot project operations. Although the detailed Organizational Design tables are oriented around nine (9) functional areas of pilot project operations, this Executive Summary is broadened to include other roles that agencies might have that were highlighted in the Procurement Strategy (Task 1.6) and the Pilot Recruitment Plan (Task 2.1).

The roles summarized below are only for the pilot project. Longer-term roles in a future RUC system are suggested in the tables, but not included in the summary below as they are speculative and subject to future legislative determinations.

2.1. Washington State Transportation Commission (WSTC)

As expected, WSTC has the most responsibility for pilot operations. Specific roles and responsibilities include:

► Procure, negotiation and enter into a turnkey contract with a prime contractor for the provision of necessary RUC technologies and support services.
► Facilitate or enter into agreements with Oregon DOT and Surrey, British Columbia outlining cooperative actions and support for their participation in the pilot project.
► Facilitate or enter into agreements with the Department of Licensing for their pilot support services, including providing access to licensing service offices (i.e., county auditors and subagents).
► Serve as the primary point of contact for all project-related communications, including public and private sector stakeholders, elected officials, NGOs, the media, and general public inquiries. [Note: this does not include issues related to RUC account setup and invoices once the pilot test has begun].
► Assist in efforts to recruit owners of up to 2,000 vehicles to participate in the RUC pilot test
► Convene RUC Steering Committee for periodic meetings to obtain policy guidance and provide pilot status reports.
► Convene regular work sessions of the interagency working group (DOL, WSDOT, WSTC) to facilitate knowledge transfer of RUC operations, and to tap agencies' expertise in spotting potential issues for a RUC system in the future.
► Commission research, white papers, special policy reports and technical memoranda to more fully explore policy-related issues that arise from a transition to a RUC system.
► Provide guidance and direction in setting the (hypothetical) RUC rates, exemptions, and mileage credit policies that will be used in the pilot test.
► Submit required reports to FHWA and other government agencies reporting on the progress, budget and schedule of the Washington RUC pilot project.

2.2. Washington State Department of Licensing (DOL)

Most of DOL's activities consist of close observation, expert advice and counsel as they participate in regular interagency working group sessions to help identify potential issues during the pilot and for any future transition from the gas tax to a RUC system. DOL activities include:

- ► Actively participate in the regularly scheduled interagency working group sessions to help identify potential issues that must be resolved in any future RUC system.
- ► Help answer or redirect questions from the public regarding the RUC pilot project.
- ► Authorize and facilitate contacts between project delivery team (consultants) and licensing service offices at select county auditors and subagents located within five geographic regions of the state.
- ► Provide specific feedback and advice related to IT, revenue collection and vehicle licensing systems.
- ► Provide feedback and advice related to gas tax refund processes
- ► Provide advice related to compliance and enforcement issues

2.3. Washington State Department of Transportation (WSDOT)

While WSDOT does not have many active roles to play in the pilot operations, they have perhaps the most interest in ensuring that any future RUC system is capable of providing sustainable transportation revenues to support the state's transportation system. WSDOT activities include:

- ► Act as financial fiduciary for federal grant funding for the Washington RUC pilot project.
- ► Transmit federally required grant funding status reports to FHWA.
- ► Actively participate in the regularly scheduled interagency working group sessions to help identify potential issues that must be resolved in any future RUC system.
- ► Communication the purpose and need for sustainable transportation revenues with public and private stakeholders, elected officials, NGOs, and the media.
- ► Help answer or redirect questions from the public regarding Washington's RUC pilot project.
- ► Assist with efforts to recruit owners of up to 2,000 vehicles to participate in the RUC pilot test by publicizing the project through WSDOT communication channels. Specific assistance with recruiting electric vehicle owners to participate in the pilot test.
- ► Provide specific advice and counsel on the accounting standards, processes and protections required in revenue collection systems (similar to tolls).
- ► Provide data, and review financial analyses related to rate setting, revenue estimation and refunds/credits for (simulated) RUC revenues in the pilot project.

2.4. Washington State Department of Revenue (DOR)

Washington's DOR is not expected to have any formal role or responsibility in the pilot test operations, but will be an important observer of the pilot operations as they can help identify issues and provide advice related to tax collection systems.

- ► Actively participate in the Interagency Consultation process, including helping to identify issues that must be resolved in any future RUC system.
- ► Help answer or redirect questions from the public regarding Washington's RUC pilot project.

- ► Advise how best to assist taxpayers, including resources and approaches necessary to achieve high taxpayer compliance rates
- ► Provide advice on other large-volume tax collection activities, including information security, audit processes, accounts receivable, administering credits and refunds, and collecting taxes from out-of-state entities.

2.5. Washington State Patrol (WSP)

WSP will not have any role in pilot test operations. However, to help develop a future RUC system, WSP should be consulted for specific input to the following areas:

- ► Detecting and deterring vehicle licensing fraud
- ► Roadside enforcement approaches and activities

2.6. Office of the State Treasurer (OST)

The Treasurer's Office has as much interest in ensuring sustainable revenue sources as WSDOT and other transportation beneficiaries, considering the state has approximately $8 billion in outstanding bonds that rely on current gas tax revenues for repayment. Areas where OST can be of special help include:

- ► Review the fiscal analysis and impacts of various potential RUC payment policies (whether RUC is prepaid, post-paid after miles driven, revenues collected monthly, quarterly, annually, etc.).
- ► Provide inputs on how a future RUC can be structured and authorized to achieve multiple fiscal policy objectives, including supporting the state's high credit rating.

2.7. State Auditor's Office (SAO)

The SAO may be able to share their experience and provide their perspectives on how a future RUC system – and the organization that would be asked to administer RUC – can best ensure program accountability and revenue security.

- ► Provide perspectives on internal audit processes, emphasizing information accuracy/security and handling of payments

3. Descriptions and Definitions

3.1. Acronyms and Abbreviations

Washington state entities:

AGO	Attorney Generals Office
DOL	Department of Licensing
DOR	Department of Revenue
OST	Office of the State Treasurer
SAO	State Auditors Office
WSDOT	Department of Transportation
WSP	State Patrol
WSTC	Transportation Commission

Other abbreviations:

AMO	Account Management Oversight
BC	British Columbia
CA	California
CAM	Commercial Account Manager
IT	Information Technology
OR	Oregon
RCA	Road Charge Administrator (notional only)
RUC	Road Usage Charge
SAM	State Account Manager
VOL	Vehicle Owner or Lessee, the pilot participant
WA	Washington

3.2. Functional Areas that must be covered in the Washington RUC Pilot

1. **Establishing & Managing Commercial Account Managers (CAMs) and the State Account Manager (SAM)[1]**
All operational functionality related to setting up and administering the network of Account Managers, which can be private businesses – "Commercial Account Managers" – or an agency or vendor acting solely on behalf of government – "State Account Manager".

2. **Setup of RUC Accounts with Vehicle Owners or Lessees (VOLs)**
All operational functionality related to having participants sign up for and enroll in the Road Usage Charge (RUC)[2].

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[1] This Functional Area does not include any procurement, negotiation and contracting that will be required to deliver the pilot project through services and technologies provided by the private sector. Acquisition of these firms is addressed separately in Implementation Work Plan Task 1.6, Procurement and Contracting Strategy.

[2] This Functional Area does not include the recruitment of potential volunteers for the pilot project. Recruitment of volunteers is addressed separately in Implementation Work Plan Task 2.1, Participant Recruitment Plan.

3. **Establishing the Pilot RUC Accounting between States (Interoperability)**
   All operational functionality related to setting up a RUC system to support participants from other jurisdictions, with special attention to Oregon drivers that are enrolled in OReGo.

4. **Processing Mileage Data and Invoicing VOLs**
   All operational functionality related to processing RUC data and collecting funds (only a small number of participants will participate in an actual exchange of currency).

5. **Managing Operational Changes and Exceptions**
   All operational functionality related to handling changes to planned operational or exceptional events. This would include facilitating a switch of mileage reporting methods by VOLS, addressing vehicles that are sold or abandoned during the course of the pilot, etc..

6. **Oversight and Audit of RUC Pilot Project Data**
   All operational functionality related to accounting and auditing for mileage statements and resulting (hypothesized) RUC revenue. For the limited real currency test with OReGo (Oregon's RUC system), these functions will be performed.

7. **Compliance and Enforcement**
   All operational functionality related to encouraging compliance with RUC reporting and investigating possible fraud[3].

8. **Managing Tax Credits and Refunds**
   All operational functionality related to crediting RUC accounts for gas taxes paid and, if authorized, issuance of refunds.

9. **Special Pilot Project Features**
   Facilitating participation from Surrey, B.C. area drivers;
   Facilitating participation from OReGo (Oregon RUC account) drivers;
   Facilitating participation from electric vehicle owners; and
   Hosting a RUC "hack-a-thon" (or similar competitive development event) to develop/test a smartphone application for deducting miles driven out-of-state.

3.3. RUC Organizational Nomenclature

RUC has a taxonomy all its own. Definitions for commonly used RUC terms are provided below. To help with understanding these new entities or functions, analogies are drawn to more familiar industries, such as tolling or wireless service providers.

Commercial Account Manager (CAM): These are private firms that provide RUC account management services, perhaps in conjunction with other transportation-related services such as car insurance, driver safety services, parking payment, etc. CAMs are similar to wireless phone carriers; they serve as the customer's point of contact when paying for minutes (or mileage); they offer the technology (i.e., cell phones, or here, mileage meters) to enable the use of minutes/miles, even if the CAM does not manufacture the devices or mileage-reporting methods. Importantly, CAMs compete against each other for customers, which in turn drive down the cost to consumers and increases the ancillary or value-added products and service offerings.

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3 Washington's RUC Steering Committee has recommended against enforcement activities and penalties for non-compliance. Instead, anomalies in mileage reporting will be detected and investigated, and any resulting contact with pilot participants will only be notifications of non-compliance.

State Account Manager (SAM): A State Account Manager is required if the jurisdiction wishes to offer government-sponsored RUC account management services without any of the features or tradeoffs involved when relying on CAMs to provide these services. A SAM can provide RUC account services either exclusively, or as an alternative to CAMs for those persons who do not wish to pay their RUC through a private company. Whether to provide account management services through a SAM will depend upon the preferences of elected officials and ultimately the public, and will likely vary depending upon jurisdiction. For example, in some states, a significant number of citizens do not trust the government to securely and appropriately handle private information; their trust in the private sector is higher. In contrast, in British Columbia the prevalent attitude is that citizens trust government much more than they do private corporations, and as a result, have a strong preference for their government to carry out these functions rather than contracting them out to private firms.

Road Charge Administrator/TBD (RCA): This is the state government entity empowered with administering RUC on behalf of the state. "Administering" can mean directly providing RUC account services by acting as the State Account Manager (SAM); or it can mean acting as the oversight agency for contracting with and overseeing the performance of the Commercial Account Managers (CAMs). The RCA could be a new operating division within an existing state agency; or an expansion of an existing division's responsibilities; or it can be a separate small agency dedicated to the mission of administering the state's RUC program. A RCA is somewhat analogous to a state toll authority, where the toll authority can be the direct providers of toll collections and account management; or the toll authority can serve as a contracting and oversight entity that ensures the performance of its selected private vendors who collect tolls and manage toll customers' accounts.

Account Management Oversight (AMO): This is a *function* that must be carried out, rather than an organization or entity. Whether RUC is administered solely by the state acting through a SAM, or if services are provided by multiple private firms acting as CAMs, the proper collection and remittance of funds must be assured through oversight of the RUC accounting process. AMO functions are a natural extension of the RUC Administrator (RCA). However, because some states are considering a minimalist approach to government staffing of a RUC system, a single small division within an agency unrelated to transportation or licensing -- such as the Department of Revenue -- could carry out the AMO functions. For Washington's context, it is most useful to think of the AMO as a function within the RCA, similar to the Chief Financial Officer's duties within a toll agency.

4.   Organizational Design Tables

This section is composed of Organizational Design tables, in which a given key functional area is broken down into subordinate functions, shown in the first column of each table. The second column is called "Coverage in Pilot," and identifies the specific entities (such as WSTC, Consultants, and other vendors) that are expected to perform a given role in the live pilot project. The third column, "Potential Participants in a Full Rollout," identifies the entities that have tentatively been identified as candidates to perform the function if the program were implemented statewide in the future. All of the potential roles are subject to discussion and change during the course of this 2016 Implementation Planning Project.

The fourth and final column in each table is labeled, "Agencies' Range of Potential Participation in Pilot (overall)." This column identifies potential roles for various Washington State agencies in the pilot related to the given key functional area. Within the limitations of this current Task 1.1, there are four potential roles for government agencies in the pilot that are identified in this column:

1. **Direct Participation** means the agency performs a function directly in the pilot. Agencies suggested for direct participation are also assumed to be listed in the second column (coverage in pilot).

2. **Close Observation** means the agency should closely observe the pilot and provide immediate feedback to the project team on activities of the pilot in this functional area, based on the agency's experience in the basic function being performed or simulated in the pilot. Immediate feedback could result in organizational changes prior to or even during the pilot project.

3. **Advice and Counsel** means the agency should observe the pilot and provide more general feedback about a function being performed or simulated. It is not expected that such feedback would result in organizational changes occurring during the pilot.

4. **Long Term** identifies bodies that may have long-term issues that need to be explored before a RUC could be implemented statewide in the future, but which may not be observable during the pilot. This last category extends the range of state entities beyond the agencies included in other categories to those outside of the Executive Branch, such as the judiciary, legislature and statewide elected offices.

In all of these cases, the purpose of the agencies' participation in the pilot is to examine issues of roles and responsibilities that could potentially arise in a full implementation of a RUC program in the future. These insights will be included in the final report to the WSTC, Governor and Legislature upon the completion of the pilot.

4.1. Pilot Functions & Responsibilities*

Functional Area 1 Establishing & Managing CAMs/SAMs	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Establish & publish requirements and standards for Commercial Account Managers (CAMs) and possibly a State Account Manager (SAM)	WSTC Consultant	Washington's Road Usage Charge Administrator -TBD (RCA)	Direct Participation: • DOL/County Auditors: RUC service delivery by subagents Close Observation: • DOL: CAM, SAM management (business partners) • County Auditors/subagents: CAM, SAM interactions (commercial partners), handling complaints; training/licensing of partners Advice & Counsel: • Various State agencies: hotlines • WSDOT: building and maintaining effective business relations with RUC service providers • DOR: working at scale with multiple tax collection parties; experience with revenue collection Long Term: • Legislature: granting authority to hold CAMs accountable
b. Vet potential CAMs	WSTC Consultant	RCA	
c. Select, test and certify CAMs; formalize and execute contracts	WSTC Consultant	RCA	
d. Communicate standards through information, training, etc.	WSTC Consultant	RCA	
e. Integrate CAMs into State IT system, to include data privacy issues	Simulation only – WSTC Consultant	RCA (IT integration can be outsourced)	
f. Address complaints/comments about specific CAMs	Consultant: web and phone customer service center	RCA	
g. Audit and assess CAMs performance	Simulation only – WSTC + Consultant	RCA	
h. Respond to CAM performance issues, including taking any necessary contract/legal action	WSTC + Consultant	1st tier – RCA Customer Service Center 2nd tier – RCA	
i. Establish State Account Manager concept (offer mileage permits and odometer readings – likely to be conducted by licensing agents and subagents)	Consultant with DOL	SAM – (either vendor or DOL)	

* Any agency roles in a future RUC system will be deliberated and ultimately decided by the WSTC, the Governor and the Legislature.

Functional Area 2 Setup of RUC Accounts with VOLs	Coverage in Pilot	Potential Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Communicate purpose and need for RUC in general	WSTC + WSDOT, with Consultant assist	WSTC, WSDOT, Legislature and Governor	
b. Provide VOLs with mileage reporting options, and availability of CAMs/SAM	WSTC Consultant	RCA	**Direct Participation:** • DOL/County Auditors/Subagents: facilitate or provide odometer readings & data transmittal
c. Establish & integrate mileage reporting choice by VOLs as essential vehicle licensing information	Parallel database (no actual integration – simulation only) by WSTC Consultant	RCA with potential integration by DOL	**Close Observation:** • DOL/County Auditors/Subagents: interaction with VOLs; scale of managing 7 million vehicles; vehicle-centric process
d. Determine method of RUC payment by VOLs and degree of participation by CAMs/SAM (Timing varies by choice of reporting method, e.g., automated is monthly or quarterly, odometer is semi-annually or annually, etc.)	No actual payments, except for limited interoperability test with Oregon DOT	CAMs/SAM: frequency of payment varies with reporting method chosen	**Advice & Counsel:** • Subagents: managing multiple touch points with end-users • WSTC, WSDOT and Governor's office: Communications/PR leadership
e. Establish process for revenue collection from VOLs, either thru CAMs or SAM	No actual payments in pilot, except for limited interoperability test with Oregon DOT	CAMs and SAM remit RUC revenues to DOR or RCA	• DOL: data storage and information security • OST: fiscal impacts of various payment periods (pre-pay, post-pay, periodic, annual, etc.)
f. If odometer reading is required, identify entities to record reading and where data is stored	Acceptable methods: • Self-reported to SAM • Reported by CAMs for some methods • "Official" reading at county auditor or subagent partners	• Self-reported to SAM • Reported by CAMs for some methods • County auditor or subagent readings to SAM	

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Functional Area 3 Establishing the Pilot RUC Accounting Between States (Interoperability)	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Establishing the parameters and MOU for the interoperability test with Oregon	WSTC Consultant	RCA	Active Participation: • Potentially, WSTC for MOUs with Oregon DOT and Surrey, BC Close Observation: • DOR: reconciliation of revenue between different states, BC • WSDOT: reconciliation of revenue between different states, BC Advice & Counsel: • WSDOT: accounting standards and processes for transaction based revenue collection (ex: tolls) • DOL/DOR: managing large scale accounts receivable
b. Establishing the parameters and MOU for integrating drivers from other jurisdictions into the Washington pilot (Surrey, British Columbia)	WSTC Consultant	RCA	
c. Identifying requirements and process for the flow of revenue (in pilot, just grant-funded stipends) between jurisdictions	WSTC Consultant	RCA	
d. Account-level and state-level revenue reconciliation	WSTC Consultant (simulated, except for interoperability test with ODOT)	RCA	

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Functional Area 4 Processing Mileage Data and Invoicing VOLs	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Receive/record mileage driven by each VOL	CAMs and SAM	CAMs and SAM	Close Observation: • DOL: account management at large scale; fee collection; integration of RUC data to (simulated) vehicle database Advice & Counsel: • WSDOT: experience with fee-based invoicing (i.e., tolls); overseeing performance of vendors in large revenue collection operations, charging and collecting on large scale; • DOL/DOR: managing large scale accounts receivable
b. Calculate actual RUC for miles driven	CAMs and SAM	CAMs and SAM	
c. Communicate the RUC to the VOLs (e.g., invoicing)	CAMs and SAM	CAMs and SAM	
d. Receive and process payment of the RUC	CAMs and SAM	CAMs and SAM	

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Functional Area 5 Managing Operational Changes and Exceptions	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Manage changes in vehicle ownership and condition (junk, wreck, moving out-of-state, etc.)	CAMs and SAM	CAM/SAM facilitated by DOL (information sharing)	**Active Participation:** • Potentially, DOL for sharing vehicle ownership status information with CAMs/SAM **Close Observation:** • DOL: extensive experience with change – new vehicles, wrecks, changing owners, etc. **Advice & Counsel:** • DOR: managing numerous customer relationships with extensive variations • WSDOT: modeling and forecasting revenues based on policy alternatives **Long Term:** • State: relationships with federal entities and tribes • WSTC: rate-setting based on legislative policy parameters • Governor and Legislature: effects of rate changes
b. Manage damage to mileage devices and reporting	CAMs and SAM	CAMs and SAM	
c. Manage changes to RUC rates, exemptions, etc. as decided by WSTC or legislative policymakers (rates based on vehicle weight, power source, emissions, etc.)	Not in pilot	TBD	
d. Manage Out-of-State drivers entering WA, and WA drivers traveling outside of WA	CAMs, SAM and WSTC Consultant	For non-WA drivers entering WA depends on whether they are enrolled in RUC or will just pay WA gas tax. For WA drivers, depends on VOL reporting method choice	
e. Manage rental vehicles	Not in pilot	Dedicated account for rental vehicles by CAMs, SAM or DOL	
f. Manage potential exemptions based on registration status. Examples: • US Federal vehicles, including US military • Foreign diplomats • Native American vehicles, both on tribal and State land	Not tested in pilot	TBD, determination of RUC-exempt status to be made by Legislature	

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Functional Area 6 Oversight and Audit of RUC Pilot Project Data	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Establish internal audit processes, emphasizing information accuracy/security and handling of payments	WSTC Consultant will verify CAMs and SAM	RCA, and perhaps SAO	Close Observation: • DOL: experience with data collection & fraud in vehicle registration, odometer, & vehicle insurance • WSP: experience vehicle licensing fraud Advice & Counsel: • SAO: extensive audit experience • DOR: Audit Division • DOL and WSDOT: internal audit experience • DOL/County Auditors: audit experience with subagents • WSP: proof of licensing & registration as part of roadside enforcement • State Attorney General: experience in whistleblower and Consumer Protection Act complaints
b. Establish external audit program (in accordance with best practices)	Not in pilot	RCA, pursuant to RCW and best practices	
c. Assign responsibilities for periodic checking on CAMs through the RCA's accounting office and other State entities as needed	WSTC Consultant	RCA	
d. Establish feedback channels for VOLs to report problems with CAMs	WSTC Consultant	RCA to provide toll-free number for VOLs; AGO for egregious misbehavior by CAMs	
e. Conduct ongoing data analysis of mileage input to flag statistical outliers	CAMs/SAM	Flagged by RCA; potentially outsourced to compliance/enforcement (e.g., DOR, WSP)	
f. Develop techniques to discourage odometer tampering	Not in pilot	DOL or WSP (pursuant to odometer fraud investigation procedures)	
g. Integrate VOLs' RUC reporting choices into DOL's vehicle field system	WSTC Consultant (simulated only – no entry into DOL system)	RCA working in collaboration with DOL	

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Functional Area 7 Compliance and Enforcement	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Determine whether state courts or administrative hearings officers will address RUC cases	Not in pilot	RCA, based on state legislation	Advice & Counsel (scenarios/ simulations): • WSP and local law enforcement: ability to check registration/insurance status when vehicle is stopped • WSP and local law: process for escalation • DOL: experience interfacing with law enforcement and/or judiciary to flag license suspensions; experience in odometer certifications and licensing fraud • WSDOT: experience in tiered escalation for non-compliance (tolling) Long term: • State legislature and judiciary – aligned with tiered processes to enforce
b. Develop a tiered approach to non-compliance (ranging from notification, to fines, to legal restrictions, to forfeitures)	Not in pilot	RCA, law enforcement, and Judiciary; potential vendors for collection activities	
c. Secure authorization for legal punitive actions	Not in pilot	Legislature upon request of RCA; law enforcement and judiciary follow up	
d. Explore use of third parties to assist with RUC collections from non-compliers	Not in pilot	RCA; potential outsourcing	
e. Coordinate with law enforcement (WSP and local) to have RUC information available with vehicle data when drivers/vehicles are pulled over	Not in pilot	RCA makes data available through DOL; WSP and local law enforcement apply standards	
f. Establish process for law enforcement to respond to RUC non-compliance	Not in pilot	Established in RCW; process initiated by RCA, WSP and local law enforcement follow up; judiciary supports	

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Functional Area 8 Managing Tax Credits and Refunds	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Establish the administrative structure to identify recipients, to collect relevant data, and to provide credits for the tax	CAMs for automated approaches and odometer charges; SAM and potentially WSTC Consultant for mileage permit	Ideally, covered by CAM/SAM	Close Observation: • DOL: experience with refunds of gas/diesel tax • DOR: experience with account credits
b. Explore technological approaches to simplify gas tax credits against any RUC owed	WSTC Consultant (potentially, hack-a-thon results – see FA 9 below)	CAM for automated options; SAM for manual options	
c. Explore technology to prevent cheating on gas tax credit	WSTC Consultant (potentially, hack-a-thon results – see FA 9 below)	CAM/SAM/RCA. Also data analysis to compare gas consumption vs. mileage reported	
d. Administer refunds for cases where credit is not feasible (such as sale of a vehicle).	Not in pilot	Possibly managed by CAM/SAM/RCA (difficulty depends on RUC method)	

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Functional Area 9 Special Pilot Project Features	Coverage in Pilot	Coverage in Potential Future RUC System*	Agencies' Range of Potential Participation in Pilot (overall)
a. Recruiting and establishing RUC accounts for drivers from Surrey, BC	WSTC Consultant, City of Surrey, and CAMs	Province of BC	Active Participation: • WSTC interagency MOU with ODOT and City of Surrey • WSDOT: recruitment and coordination with EV drivers Close Observation: • DOR: experience with tax collection for cross-border activities
b. Establishing Washington RUC accounts for OReGo-enrolled drivers from Oregon	WSTC Consultant, with assistance from ODOT and OReGo CAMs	Oregon DOT	
c. Establishing accounting mechanisms and options for future RUC interoperability with other states, provinces	WSTC Consultant	RCA	
d. Recruiting and establishing RUC accounts for drivers of Electric Vehicles	WSTC Consultant with assistance from WSDOT	Not targeted at EV drivers	
e. Plan and implement a developer's hack-a-thon aimed at providing a new smartphone app that deducts out-of-state miles driven from a RUC invoice	WSTC Consultant	N/A	

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