Oregon Department of Transportation

Road Usage Charge Program

System Requirement Specifications

For the Road Usage Charge Program

Version 1.6

Date: December 1, 2015

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Revision History

Date Of Revision	Reason For the Change and Short Summary of the Revisions Made	Version Number
05/12/14	Procurement Document Version	1.0
9/17/14	Revisions to language and requirements	1.1
10/20/14	Revisions to language	1.2
12/19/14	Revisions to language	1.3
02/23/15	Revisions to language to provide clarity on requirements	1.4
6/5/15	Revise DC.FSM.11; add DC.FSM.18; Update RUC Rate Table	1.5
12/01/15	Revisions for general cleanup and mutually agreed upon changes during development and implementation	1.6

1. System Overview

This section presents an overview of the system being specified in this document.

1.1 System Purpose

The intention of the Road Usage Charge System is to implement a cost-effective system for collecting the road usage charge, one that is highly automated and is easy to use and understand.

1.2 Document Overview

This SRS document contains the overall requirements for the Road Usage Charge System and the specific subsystem requirements for the Mileage Collection subsystem, the RUC Processing (RUCP) subsystem, and the Road Usage Charge Administration Subsystem (RUCAS). After presenting a system overview, the document presents the full system requirements, followed by the requirements for each of the subsystems.

This version of the SRS is directed to potential Account Managers and is intended to provide comprehensive requirements for the overall Road Usage Charge System by defining the requirements for each of its subsystems.

The Oregon Vehicle Road Usage Charge system includes a Mileage Collection Subsystem, a RUC Processing Subsystem, and a Road Usage Charge Administration Subsystem, as shown in this diagram below. Each of the three subsystems is described in this document.

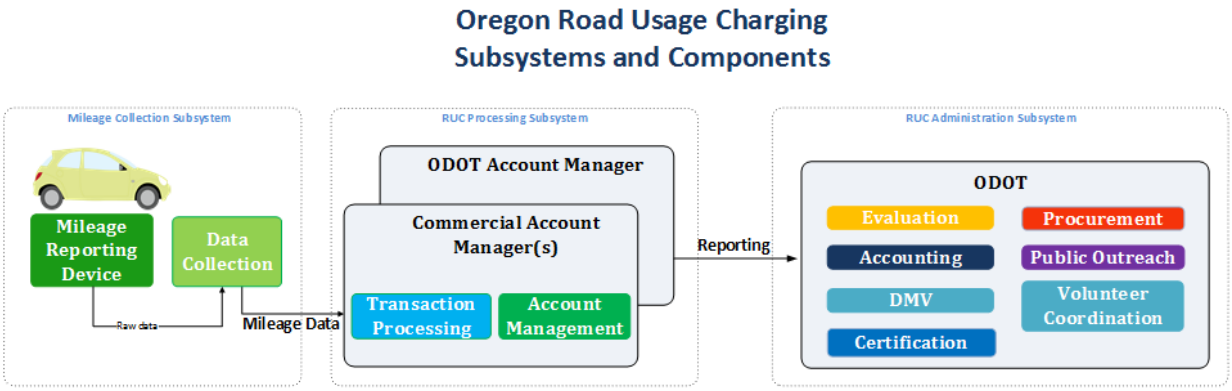


Figure 1: RUC Subsystem Detail

1.3 Project Documents

The technical aspects of the project work are documented primarily in this document. Other critical program aspects are described in these documents:

- System Overview Document which provides the operational concepts and functional capabilities which the project will address.
- Business Requirements Document (BRD) which describes the business and operational requirements for the RUC Program.
- Interface Control Document (ICD) which provides technical specifications of all system interfaces.

1.4 Document Naming Conventions

The detailed software and system requirements appear in the “Detailed requirements” subsection of each subsystem requirements section (5.3.5, 6.3.5, and 7.3.5). Each detailed requirement is coded according to the following form:

<component abbreviation>.<function abbreviation>.<requirement index>

The detailed requirements are grouped by functions. Functions are high-level objectives of the subsystems. In the following document, functions are abbreviated using the three capitalized letters in the function name. For example, the first function of the MRD is “Record accumulated Mileage Traveled by day.” The abbreviation of the function is thus RMT, and the requirements for this MRD function are coded:

MRD.RMT.#, where # is the requirement index

2. System Requirements

The following are overall general system requirements. Overall performance, security, and facilities requirements appear in specific sections below:

- The system shall provide user choice of technology and service provider.
- The system shall be auditable.
- The system shall be cost-effective.
- The system shall collect road usage charge from tax-liable users for travel in Oregon.
- The system shall provide credits for Oregon fuel taxes paid.
- The system shall not charge for out of state travel for users who choose an advanced MRD.
- The system shall not charge for travel off-road or on private lands for users who choose an advanced MRD that offers the functionality to determine travel off-road or on private roads.
- The system shall contain redundancy and backup information.
- The system shall support interoperability.
- The system shall be expandable and flexible for greater number of users and revenue collection uses.
- The system shall provide an open architecture that allows private companies to provide either a technology component (mileage collection subsystem) or a service component (RUC Processing subsystem) or both to do so.

2.1 System Context

The system described in this document provides the technology to support the program goals for the Road Usage Charge Program. Functions between and within subsystems are defined in this document. The system is embedded in the context of the overall program.

The program context diagram shown below illustrates key stakeholders within the program reliant on the system. Systems are designed in such a way to ensure the accurate and timely transfer of information.

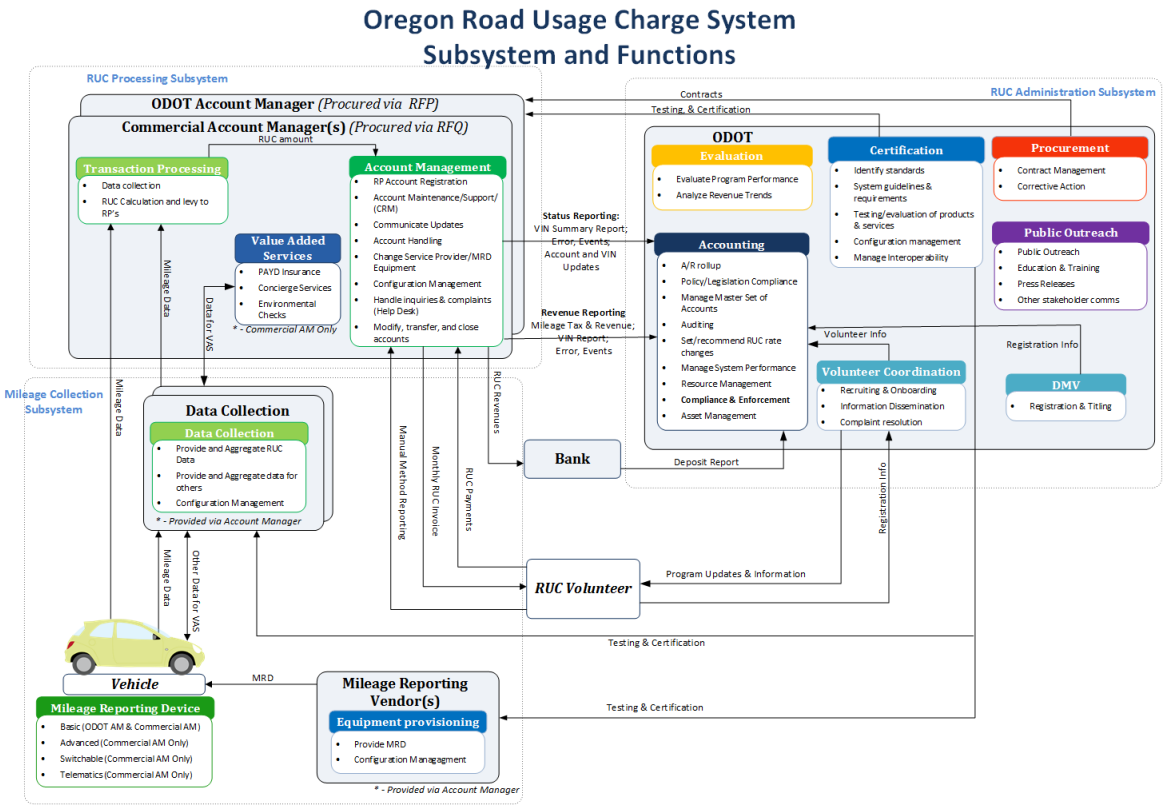


Figure 2: RUC Program Context Diagram

2.2 System Security, Disaster Recovery, and Data Retention

System Security must comply with the standards set forth within ODOT and the State of Oregon. As part of this, the system design and an inventory of information security controls are requested of the Account Managers. Account Managers will propose Security and Disaster Recovery details for the overall system to ensure adequate protection and assurance of recovery options in the event of an unexpected incident.

General Security Requirements:

Requirement #	Description
SYS.SSD.1	The contractor shall provide a system architecture diagram which illustrates the location and key security measures proposed for the RUC Program system.
SYS.SSD.2	The contractor shall assess the information and security of their operation and systems. Based on this assessment, the contractor shall document Information Asset Classification in accordance with the ODOT's Information Asset Handling Requirements.
SYS.SSD.3	The Classification documentation shall list what PII is stored and the corresponding system and operational controls to maintain the appropriate level of security and access.
SYS.SSD.4	The Contractor shall make RUCA aware of any system breach, or potentially significant informational breach immediately upon discovery

System Payment Security:

Payment security is essential for protecting the individuals participating in the program. Below are the requirements for payment security:

Requirement #	Description
SYS.SSD.5	The contractor shall provide proof of compliance with security standards required for the payment options they provide. For example, PCI 3.0 for transactions.
SYS.SSD.6	The contractor shall provide their information security policy for how payment security is addressed in these areas: • Firewalls to protect cardholder data • Protection for stored cardholder data • Restrictions to data, physical or otherwise • Tracking of access to cardholder data • Regularly testing security systems and processes

System Level Security Requirements:

To ensure the proper level of security within the systems that will be used for ODOT information, the following requirements detail the policies requested of the Contractor to cover the areas included below:

Requirement #	Description
The Contractor shall provide their information security policies as it relates to the following areas:	
SYS.SSD.7	*Access Control:* This should include but not be limited to user access set up and termination, password management, and administrator activities.
SYS.SSD.8	*Access Control,* as it relates to password security and logging: This should include but not be limited to password encryption, logging of access attempts (granted and denied), and administrative access to log files.
SYS.SSD.9	*Access to PII:* The contractor shall provide a description of the authentication methods used for systems which will contain personally identifiable information.
SYS.SSD.10	*Antivirus and anti-malware:* This should include but not be limited to applications being used, scan and scope frequencies, and the incident response process.
SYS.SSD.11	*Desktop security*: This should include but not be limited to firewalls, update process and workstation encryption.
SYS.SSD.12	*Server management:* This should include but not be limited to firewalls, encryption, and Administrator processes.

Requirement #	Description
SYS.SSD.13	*Back up management:* This should include but not be limited to testing and restore processes, access to back up information, encryption, and media options.
SYS.SSD.14	*Network security:* This should include but not be limited to firewalls used, public/private network separation, and encryption.
SYS.SSD.15	*Intrusion Detection:* This should include but not be limited to detection, internal monitoring practices, and incident response.
SYS.SSD.16	*Encryption:* The Contractor shall provide their policy for encryption for each level where ODOT data will reside (file, database, disk, etc.). This policy should include the procedure for preventing unauthorized access. Also, the Contractor shall indicate if they use Advanced Encryption Standard (AES) 128-bit or stronger.
SYS.SSD.17	*System lifecycle management:* This policy should include but not be limited to the change control process (authorization through implementation), security patch process, and ongoing maintenance of updates.
If the Contractor expects to use any of the following other access options, they shall provide their information security policies as it relates to the following areas:	
SYS.SSD.18	*Remote access:* This should include the specific uses of remote access to ODOT data, authentication method(s), encryption used, mobile device policy and security measures.
SYS.SSD.19	*Wireless management:* This should include the specific uses of wireless access to ODOT data, encryption used, guest/ non-guest access levels and incident response. Also, indicate if the contractor uses industry supported access standards 802.11, which standard is being employed. (i.e. 802.11a, 802.11b, 802.11e, 802.11g, 802.11i, 802.11n)

Data Retention

Like security requirements, there are requirements specific to ODOT for data retention. Please refer to the Oregon State mandated data retention requirements for clarification at: http://arcweb.sos.state.or.us/pages/rules/oars_100/oar_166/166_300.html.

Requirement #	Description
SYS.SSD.20	The Contractor shall retain RUC Payer Account data and account financial information for 6 years. (Statute 166-300-0015 and 166-300-0025). With the exception in Senate Bill 810 ("SB 810"), 2013 Oregon Laws, chapter 781 regarding location and daily metered use data.
SYS.SSD.21	The Contractor shall retain computer system security access logs for 3 years (Statute 166-300-0030), Other system security records retain for 3 years after superseded or expired.
SYS.SSD.22	The Contractor shall refer to the OR state data retention statutes for clarification at: http://arcweb.sos.state.or.us/pages/rules/oars_100/oar_166/166_300.html

Disaster Recovery:

Likewise, Disaster Recovery is important to plan for in order to identify how events may impact the normal course of business. At a high level, the requirement for disaster recovery planning is listed below. Further detail is listed in the contract terms.

Requirement #	Description
SYS.SSD.23	The contractor shall provide a plan which details its process for Disaster Recovery should there be an incident which threatens or impacts normal business operations while contracted with ODOT for the RUC program.

2.3 System Performance

Performance requirements listed in this section specifically identify key areas of system performance. These requirements are also in context with their related components in following chapters. Performance requirements include the following:

Accuracy

Requirement #	Description	Subsystem
MRD.RMT.9	The MRD shall calculate miles traveled per day to within +/-5% of the actual value, or use an approach to calculate miles traveled that has been approved by ODOT.	Mileage Collection
MRD.CFU.4	If data to calculate estimates of fuel consumption is available, the MRD shall calculate estimates of daily fuel consumption within +/-5% of the actual value, or use an approach to calculate miles traveled that has been approved by ODOT.	Mileage Collection
MRD.VLD.1	All advanced MRD shall be able to determine the location of the vehicle with sufficient accuracy to be able to determine correctly in which Rule ID the vehicle is traveling at least 99% of the time when within a half mile of the border between Rule IDs.	Mileage Collection
MRD.VLD.2	Optionally, for MRDs that offer the functionality, the MRD shall be able to determine the location of the vehicle to within 50 feet to be able to determine whether the vehicle is traveling off of roads that will be assessed a vehicle Road Usage Charge.	Mileage Collection

Availability

Requirement #	Description	Subsystem
TP.HER.1	The Transactions Processor shall have high availability (99.9% uptime).	RUC Processing
DC.FSM.17	If the Data Collection Component is housed in the MRD, the Data Collection Component shall transmit the mileage message to the Road Usage Charge Processor, on at least 99% of days that the MRD is operating and has communications.	Mileage Collection
MRD.AMT.7	The MRD shall communicate with data collection (either transmit reportable miles to data collection or provide positive notification), on at least 99% of days that the MRD is operating and has communications.	Mileage Collection

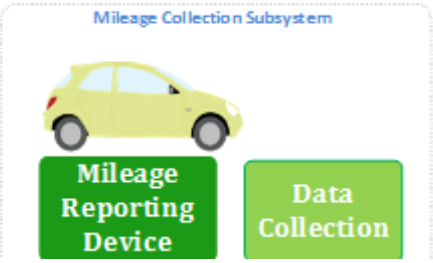
Durability

Requirement #	Description	Subsystem
MRD.HAV.1	MRD.HAV.1 The MRD shall be designed to continue to operate even under the following operating conditions: • Voltage Range from 9.0 VDC to 18.0 VDC • Maximum Relative Humidity – non condensing of 90% • Temperature Range from -40ºC to +85ºC	Mileage Collection
MRD.HAV.2	The MRD shall have an estimated Mean Time Between Failures (MTBF) of no less than 5 years.	Mileage Collection
MRD.MPM.2	The MRD shall not cause a vehicle battery in good condition to discharge over a period of 2 months when the vehicle is not in use.	Mileage Collection

3. Mileage Collection Subsystem Requirements

3.1 Subsystem Overview

The Mileage Collection subsystem is composed of two components, the Mileage Reporting Device (MRD), which will be installed in a vehicle for the collection of mileage data, and the Data Collection component, which takes the raw data from the MRD, stores it for auditing purposes, and creates and sends the mileage messages to the RUC Processing subsystem.



3.1.1 Subsystem Purpose

The Mileage Collection subsystem interfaces with vehicles subject to the Road Usage Charge, and measures and records the miles traveled each day by the vehicle. The daily accumulated miles traveled are reported by the Mileage Collection subsystem to the RUC Processing subsystem for computation of the Road Usage Charge due by the vehicle owner. If the Mileage Collection subsystem utilizes an advanced MRD with location technology, and uses map technologies which identify the roads subject to the Road Usage Charge for miles driven (generally publicly maintained roads within the State of Oregon), the map technology will differentiate miles driven on roads subject to the Road Usage Charge in state and out of state. Likewise, if the map technology provides the capability, it will also differentiate between public and non-public roads.

3.1.2 Objectives of the Subsystem

The Mileage Collection subsystem must accomplish the following functions:

- Monitor vehicle systems to accurately measure the miles driven each day, and if equipped, accurately measure the fuel consumed.
- For advanced, location-based MRDs, allocate the miles driven each day by the miles driven on RUC-chargeable (public, in state) roads and by non-RUC chargeable (public out-of-state, and, if applicable, private) roads.
- Periodically send mileage data to the RUC Processing subsystem in mileage messages conforming to the format specified in the Mileage Collection to RUC Processing section of the Interface Control Document (ICD).
- Operate with high availability, built-in diagnostic components, automated error recovery from soft failures, auto-reset from hard failures, and a high mean time between failures (MTBF) as specified in these specifications.
- Monitor the health and performance of the subsystem and report health status to the RUC Processing subsystem.

The Mileage Collection subsystem has been defined as two components, the Mileage Reporting Device (MRD), and the Data Collection component.

The MRD provides the interface to the vehicle for measuring miles traveled and fuel consumed, and for advanced MRDs, determining vehicle location for the purposes of determining chargeable miles driven. It is therefore necessary for the MRD to be associated with the vehicle systems.

A data collector is a possible aspect of the mileage collection subsystem which is designed to interface with multiple types of MRDs. The Data Collection component collects measurement and location data provided by the MRD, stores the data, both for later communication and

audits, and creates and sends the standard format mileage messages to the RUC Processing subsystem.

The Data Collection component is not required to reside in the vehicle. Implementers have the option of:

- Physically locating the Data Collection component directly into the MRD and sending the mileage message to RUC Processing directly from the vehicle, OR
- Implementing the Data Collection component centrally, sending the mileage message to RUC Processing from the central system, and communicating between the MRD in the vehicle and the central Data Collection component for collection of vehicle data.

3.2 Subsystem Requirements

Subsystem Context

As described above, the Mileage Collection subsystem comprises components used to collect and transmit the mileage message—the MRD, which is always located in the vehicle, and the data collection component, which may be housed with the MRD, or elsewhere.

The following block diagram provides an example implementation of the RUC Processing subsystem.

Figure 3: MRD and DC Subsystem

3.2.1 Subsystem Security

Electronic security measures are vital to the success of the road usage charge system.

A major part of electronic security is the MRD's resistance to fraud and tampering. It is desirable that the MRD be encased in a physical enclosure that resists tampering with the components of the device. As specified below, the MRD shall be installed in the vehicle in a manner which resists tampering with the device or deliberately altering the accumulation of mileage data. The MRD shall monitor its functions and accumulated data and detect any anomalies which are indicative of possible tampering or attempted fraudulent alteration of monitored data, and record such events in the performance logs.

If the MRD has multiple sources of data, it should verify that the data sources correspond. For example, if an MRD has both vehicle data information including vehicle speed from the vehicle data port, and location information, it should ensure that the speed information from the data port is within a reasonable tolerance of the speed derived from the location data.

The MRD should support measures to authenticate location data when the device is running on third-party software, such as when the MRD interfaces with a smartphone. Examples include:

- Comparing data derived from that device with data from the vehicle
- Checking for known fraudulent location data programs running on the device

- Checking for unusual location behavior (all location data being identical or within a very small confined region), and
- Comparing the location of the receiver communicating with the device (such as a cell tower) with the location data produced by the device.

3.3 Mileage Collection Subsystem Requirements Specifications

The requirements that follow are organized by the functional architecture.

3.3.1 Overview

This subsystem has two main processes.

Accumulate miles by day—record miles traveled by day, and in the case of advanced MRDs, by Rule ID—completed by the MRD component.

Transmit miles to RUC Processing subsystem—create mileage message as specified in ICD and transmit to the RUC Processing subsystem—completed by the data collection component.

3.3.2 Detailed Functional Requirements

Subsystem: Mileage Collection

Component: Mileage Reporting Device

Function 1: Record accumulated mileage traveled by day

Requirement #	Description
MRD.RMT.1	The MRD shall interface with the vehicle in which it is installed to monitor and collect miles traveled by the vehicle.
MRD.RMT.2	The MRD shall record accumulated miles traveled by day.
MRD.RMT.3	The MRD shall not delete any data sent to Data Collection for computing accumulated mileage until the data is stored by Data Collection.
MRD.RMT.4	The MRD shall report the miles traveled to Data Collection in such a manner that Data Collection can determine the day on which the miles were driven.
MRD.RMT.5	The Basic MRD shall not contain any hardware designed primarily to determine location, even if such hardware is disabled by software.
MRD.RMT.6	The advanced MRD shall either contain hardware to determine location or interface with external user-provided wireless devices that contain hardware to determine location.
MRD.RMT.7	When the advanced MRD can determine the location of the vehicle, it shall record the mileage traveled in the Rule ID in which the vehicle is traveling. When the advanced MRD cannot determine the location of the vehicle, it shall record mileage traveled in the Rule ID for undifferentiated miles.
MRD.RMT.8	If an MRD is capable of operating as either a basic or advanced MRD, it shall provide an indication to the driver of which mode it is operating in at any time.

MRD.RMT.9	The MRD, or an approach approved by ODOT, shall calculate miles traveled per day to within +/-5% of the actual value.

Function 2: Resist fraud and tampering

Requirement #	Description
MRD.RFT.1	The MRD shall be encased in a physical enclosure that resists opening and provides a means to visually verify unauthorized opening of the enclosure.
MRD.RFT.2	The MRD shall provide a means to detect unauthorized firmware changes.
MRD.RFT.3	The MRD shall verify consistency of all data sources available to detect any anomalies that are indicative of possible tampering or attempted fraudulent alteration of monitored data, and record such events in the performance logs.
MRD.RFT.4	The MRD shall be attached to the vehicle. It shall provide the capability to detect when it has been removed and reinstalled or power has been lost to the device.
MRD.RFT.5	When an MRD has been reinstalled or the power has been restored, the MRD shall be capable of determining if it has been installed into a new vehicle or remains in the original vehicle.
MRD.RFT.6	The MRD shall contain a record of the hardware and software version that is currently installed. Changes to the MRD hardware or software shall be reflected in the version number fields of the mileage message.
MRD.RFT.7	The MRD shall have the capability to detect and record when software resets of the MRD are carried out.
MRD.RFT.8	If an advanced MRD employs a connection to a third-party device for obtaining location data, it shall support measures to authenticate the location data from that device.

Function 3: Have sturdy physical structure and be installable safely in vehicle

Requirement #	Description
MRD.SSS.1	The MRD shall be encased in a sturdy physical enclosure and be designed to mount securely to prevent disruption of normal operations, even under severe operating conditions of the vehicle.
MRD.SSS.2	The MRD shall be mounted in the vehicle in a manner that does not compromise the operation of any other systems of the vehicle or prevent maintenance of any other system or component of the vehicle.
MRD.SSS.3	The MRD shall be mounted in the vehicle in a manner that does not compromise the safety of the operator or passengers of the vehicle.

Function 4: Maintain power management

Requirement #	Description
MRD.MPM.1	The MRD shall retain all stored data and parameters even under periods of sustained disruption of power to the unit.
MRD.MPM.2	The MRD shall not cause a vehicle battery in good condition to discharge over a period of 2 months when the vehicle is not in use.

Function 5: Compute fuel usage

Requirement #	Description
MRD.CFU.1	In vehicles that use liquid fuel, if the vehicle interface used by the MRD allows monitoring of or an estimate of fuel usage (based on parameters such as MAF or MAP sensor data), the MRD shall record the accumulated fuel used by the vehicle by day.
MRD.CFU.2	When the advanced MRD can determine the location of the vehicle and the MRD allows monitoring of or an estimate of fuel usage, it shall record the fuel usage in the Rule ID in which the vehicle is traveling. When the advanced MRD cannot determine the location of the vehicle, it shall record fuel usage in the Rule ID for undifferentiated miles.
MRD.CFU.3	If the MRD determines that the data used to determine fuel usage is not reliable, it shall report no fuel data available.
MRD.CFU.4	If data to calculate estimates of fuel consumption is available, the MRD, or an approach approved by ODOT, shall calculate estimates of daily fuel consumption within +/-5% of the actual value.

Function 6: Have high availability

Requirement #	Description
MRD.HAV.1	The MRD shall be designed to continue to operate even under the following operating conditions: • Voltage Range from 9.0 VDC to 18.0 VDC • Maximum Relative Humidity – non condensing of 90% • Temperature Range from -40ºC to +85ºC
MRD.HAV.2	The MRD shall have an estimated Mean Time Between Failures (MTBF) of no less than 5 years.

Function 7: Maintain an indication of service/performance quality (health data)

Requirement #	Description
MRD.RSP.1.1-13	The MRD shall maintain a log of the following errors and events, including date and time the error/event occurred, detected by the built-in diagnostics: (Supporting documentation that provides error descriptions, flow diagrams and use case scenarios are provided in Appendix B.)

Requirement #	Description
MRD.RSP.1.4	Disconnects / reconnects (Includes the date/time of disconnect and reconnect, as well as data on miles while disconnected if available) Clarification: There shall be one instance of this error for a disconnect event, and a second instance of this error for the reconnect event.
MRD.RSP.1.5	Connected to new vehicle (Includes date/time of the connection) Clarification: This event shall be reported each time the device is connected to a vehicle that is different from the last vehicle it was connected to. This includes new device activations.
MRD.RSP.1.12	Missed mileage (Includes date the miles were missed (time not required)) Clarification: Missed mileage is set anytime in a given day that the device is not 100% certain it has collected all miles driven in that day. For example, the device was disconnected for over 1 minute or the device was updating software, and was unable to count miles. Note: When this is set is vendor-implementation specific.
MRD.RSP.1.13	Vendor-specific Clarification: Vendor-specific error codes shall not be used for any RUC logic.
MRD.RSP.2	The MRD shall not delete any error or performance log entries until values are stored by Data Collection.

Function 8: Transmit accumulated mileage traveled, fuel usage data (optional), and health data

Requirement #	Description
MRD.AMT.1	The MRD shall send the accumulated miles traveled, or data sufficient for the computation of accumulated miles traveled per day to the Data Collection component.
MRD.AMT.2	The MRD shall send error and event log data to the Data Collection component for reporting and storage.
MRD.AMT.3	The MRD shall send the accumulated fuel usage data, if computed, to the Data Collection component.
MRD.AMT.4	If the MRD detects it is installed in a new vehicle, the MRD shall send all unreported accumulated miles for the previous vehicle to the Data Collection component immediately (or as soon as possible if communications is not available) separately from the miles reported from the new vehicle. A new vehicle is identified by a new VIN and/or change in other data reported through the vehicle interface. The MRD shall immediately (or as soon as possible if communications is not available) report to Data Collection that the MRD has been installed in a new vehicle including the VIN, if available.

Requirement #	Description
MRD.AMT.5	The MRD shall either contain the data collection component, or shall contain communications hardware capable of direct communications with a data collection component (requiring no external communications devices).
MRD.AMT.6	If the data collection is not integrated into the MRD, in the absence of reportable miles for any given day, the MRD shall provide positive notification to data collection that the MRD is still operational for each day the MRD is operating and has communications.
MRD.AMT.7	The MRD shall communicate with data collection (either transmit reportable miles to data collection or provide positive notification), on at least 99% of days that the MRD is operating and has communications.

Function 9: Vehicle location differentiation to defined accuracy

Requirement #	Description
MRD.VLD.1	All advanced MRD shall be able to determine the location of the vehicle with sufficient accuracy to be able to determine correctly in which Rule ID the vehicle is traveling at least 99% of the time when within a half mile of the border between Rule IDs.
MRD.VLD.2	MRDs optionally shall be able to determine the location of the vehicle to within 50 feet to be able to determine whether the vehicle is traveling off of roads that will be assessed a vehicle Road Usage Charge.
MRD.VLD.3	If the mapping functionality is located in the MRD, The MRD shall provide a means for updating map definitions and data points, as well as the definitions of the Rule ID / Sub Rule ID when changes are warranted based on business rule definitions.
MRD.VLD.4	If needed for advanced mileage measurement, contractors must utilize one of the commercially available mapping services and propose it for ODOT approval to differentiate taxable and non-taxable miles.

Component: Data Collection

Function 1: Receive data from MRD

Requirement #	Description
DC.RDO.1	MRD providers shall provide a Data Collection Component or arrange with another selected vendor to provide the Data Collection Component.

Requirement #	Description
DC.RDO.2	If the Data Collection component is implemented remotely from the MRD, the communications between the MRD and the Data Collection component shall be implemented to prevent any data loss, even after periods of disrupted communications.
DC.RDO.3	If the Data Collection component receives data from multiple vehicles, it shall maintain the data from each vehicle separately

Function 2: Have configurable parameters

Requirement #	Description
DC.CPM.1	The Data Collection component shall provide a means to change configurable parameters without having to reprogram the component.
DC.CPM.2	Configurable parameters shall include at a minimum the time period for reporting data to the RUC Processing subsystem, the communications address of the RUC Processing subsystem, and the storage period.
DC.CPM.3	Data must be reported to the RUC Processing subsystem at least once a month and must be reported for each day in the month.

Function 3: Formulate and send mileage messages to transactions processor

Requirement #	Description
DC.FSM.1	The mileage message shall be created from the accumulated data received from the MRD component.
DC.FSM.2	The mileage message shall conform to the message defined in the Mileage Collection to RUC Processing section of the Interface Control Document.
DC.FSM.3	The mileage message shall reflect all error and event conditions reported by the MRD during the period reported in the mileage message. The mileage message shall be encoded as defined in the 'Mileage Collection to RUC Processing' section of the Interface Control Document.
DC.FSM.4	All mileage messages shall be transmitted daily, for each MRD and full day collected. If no data is received, no data shall be sent to the RUC Processing subsystem.
DC.FSM.6	The Data Collection component shall ensure that the Message ID is unique to each message sent.
DC.FSM.7	The Data Collection component shall accept an acknowledgement message from the RUC Processing subsystem that includes the MessageID of the message received.

Requirement #	Description
DC.FSM.8	The Data Collection component shall include accumulated mileage data, and if available, accumulated fuel usage data, for all complete days since the last day reported in the most recently acknowledged mileage message.
DC.FSM.9	If the Data Collection component does not receive an acknowledgement message from the RUC Processing subsystem for a mileage message sent, all accumulated mileage and fuel usage data from that message shall be included in the next scheduled mileage message transmitted to the RUC Processing subsystem.
DC.FSM.10	The Data Collection component shall update its date/time clock in such a way that the date/time of the MRD and other vendor system components are in sync. Examples include using an external source (i.e. GPS) or syncing with the internal clock of the RUC Processing subsystem.
DC.FSM.11	(OAM only) For purposes of reporting miles traveled by day, a day shall be defined as 12:00:00 am to 11:59:59 pm UTC.
DC.FSM.12	If the Data Collection Component is housed in a MRD, it shall contain hardware capable of transmitting the Mileage Message to the RUC Processing subsystem without an external device for communications.
DC.FSM.13	The Data Collection Component shall transmit the Mileage Message to the RUC Processing subsystem that is associated with the MRDID in the mileage message.
DC.FSM.14	If the MRD provides fuel usage data to the Data Collection component, the Data Collection component shall set the Fuel Use Method to the value indicating actual fuel use is calculated.
DC.FSM.15	If the Data Collection Component receives mileage from multiple vehicles (VINs) from a given MRD, it shall send the data from each vehicle in separate mileage messages.
DC.FSM.16	When the Data Collection Component receives notification that the MRD has been plugged into a different vehicle, it shall immediately (or as soon as possible if communications is not available) send a mileage message with no miles to the RUCP for the different vehicle with the new vehicle event indication set.
DC.FSM.17	If the Data Collection Component is housed in the MRD, the Data Collection Component shall transmit the mileage message to the Road Usage Charge Processor, on at least 99% of days that the MRD is operating and has communications.
DC.FSM.18	(CAM only) For purposes of reporting miles by day, a day shall be defined by the vendor consistently for all vehicles. The definition must include the offset from UTC time. The definition must be documented, provided to and approved by the Agency.

Function 4: Handle errors

Requirement #	Description
DC.HER.1	The Data Collection component shall include built-in diagnostics to identify processing errors, identify the cause of the errors and recover to an operational state when possible.
DC.HER.2	The Data Collection component shall maintain a log of all errors detected by the built in diagnostics.

Function 5: Determine mileage traveled by road usage charge rate code by day using location data

Requirement #	Description
DC.DMT.1	The Data Collection component shall compute for advanced MRDs the miles traveled by RuleID (the code for the rate chargeable by location) by day. For the basic MRD, all miles traveled shall be included in the RuleID for undifferentiated miles. For advanced MRDs, the undifferentiated miles shall include all mileage not reported in other Rule IDs.
DC.DMT.2	The Data Collection component shall compute for advanced MRDs the fuel usage by RuleID (the code for the rate chargeable by location) by day. For the basic MRD, all fuel usage shall be included in the RuleID for undifferentiated miles.
DC.DMT.3	If the data from the MRD differentiates mileage traveled on non-taxable roads and/or offroad, then that mileage shall be included in the mileage message in the RuleID for non-taxable roads.
DC.DMT.4	The Data Collection Component shall determine the RuleID and if applicable mileage on non-taxable roads based on location data from advanced MRDs using a Road Usage Charge Administration approved map.
DC.DMT.5	If the mapping functionality is located in the Data Collection Component, the Data Collection Component shall provide a means for updating map definitions and data points, as well as the definitions of the Rule ID / Sub Rule ID zones when changes are warranted based on business rule definitions.

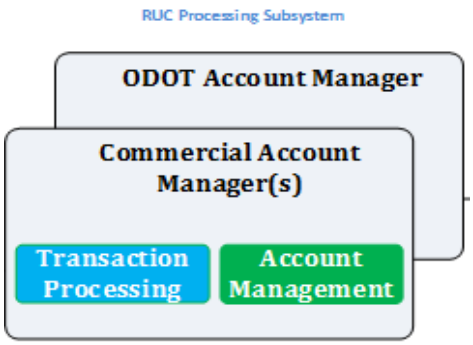
4. RUC Processing Subsystem Requirements

4.1 Subsystem Overview

This section presents an overview of the subsystem being specified in this document.

Subsystem Purpose

The purpose of the RUC Processing subsystem is to collect mileage information from the MRDs via the Data Collection component, convert mileage data to Road Usage Charge amounts, remit Road Usage Charge collections and summary reports to ODOT, and manage RUC Payer (RP) accounts (accounts of the individuals responsible for those vehicles).



Objectives of the Subsystem

The objectives of the RUC Processing subsystem are to collect mileage records from the Mileage Collection subsystem, calculate the RUC due, and store the mileage/RUC records. Additionally, the RUC Processing subsystem is used to create and maintain the RP accounts, collect the RUC payments from the RP, and settle the RUC owed to ODOT on a periodic basis.

4.2 Subsystem Requirements

The RUC Processing subsystem is a core component of the Road Usage Charge System that collects mileage information from the Mileage Collection subsystem, calculates and summarizes RUC due, collects the RUC and pays the RUC owed to the State of Oregon.

Subsystem Context

The RUC Processing subsystem interacts with the following external entities:

- Mileage Collection Subsystem
- Oregon Department of Transportation (RUCA, shown below)
- Oregon Department of Treasury
- RUC Payers

The following block diagram provides an example implementation of the RUC Processing subsystem.

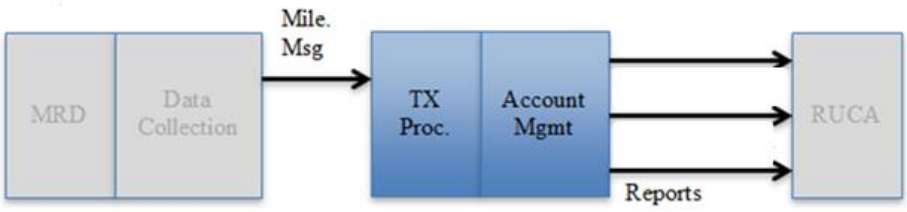


Figure 4: RUC Processing Subsystem

Subsystem Security

The RUC Processing subsystem is responsible for collecting and maintaining records for RUC owed to the State of Oregon, collecting the RUC, and paying the RUC to the Oregon Department of Treasury. As such, it must establish and maintain physical and operational security equal to, or greater than, equivalent functions within the State of Oregon government.

The system requirements which cover security, backup and recovery shall also cover specific details for this subsystem. These security requirements are referenced in previous sections on this document. Additionally, the security of the Mileage message and the various messages from the RUC Processing subsystem to the RUC Administration Subsystem are discussed in the ICD.

4.3 RUC Processing Subsystem Requirements Specifications

The Transaction Processing component collects mileage and configuration/status messages from the Mileage Collection subsystem, calculates the RUC, logs the messages, and forwards each message for storage in the Account Management database.

Software Overview

The Transaction Processing component performs five primary tasks.

1. Collection of mileage information from the Mileage Collection subsystem.
2. Collection of configuration/status information from vehicles on a periodic basis.
3. Calculation of the RUC for the miles driven.
4. Logging of mileage/configuration messages.
5. Forward the mileage/configuration messages to the Account Management database.

The Account Management component performs eight primary tasks.

1. Storage of RUC Payer account information, mileage, fuel usage, etc.
2. Creation and maintenance of RUC Payer information in a database.
3. Generation of RUC Payer statements on a periodic basis, and transmittal of statements to the RUC Payer.
4. Collection of RUC Payments from the RUC Payer, and recording of these payments in the system
5. Transfer of RUC balances to the Oregon Department of Treasury on a periodic basis.
6. Transfer of summary information to the Oregon Department of Transportation on a periodic basis.
7. Process VINs for approval that apply for the RUC program through the Oregon Department of Transportation.
8. Provide an online service interface for RUC Payers to enroll and manage their account.

4.3.1 Detailed Functional Requirements

Subsystem: RUC Processing

Component: Transactions Processor

Function 1: Collect mileage message from data collection and send acknowledgement to data collection

Requirement #	Description
TP.CMM.1	The Transactions Processor shall receive Mileage Messages on a 24x7 basis so that the Mileage Collection subsystem can transmit at any time.
TP.CMM.2	The Transactions Processor shall acknowledge receipt of the mileage message as specified in the Mileage Collection to RUC Processing Interface Control Document after storing the received data.

Function 2: Handle errors

Requirement #	Description
TP.HER.1	The Transactions Processor shall have high availability (99.9% uptime).
TP.HER.2	The RUC Processing subsystem shall log errors that are associated with the Mileage Message received.

Function 3: Calculate/apply RUC

Requirement #	Description
TP.CAR.1	The RUC Processing subsystem shall calculate the RUC for the miles driven using the RUC Rate Table, as provided by the state in which the vehicle is registered.
TP.CAR.2	After the Mileage Message is validated; the RUC Processing subsystem shall calculate the RUC and store it in a manner that it can be associated with the Mileage Message.
TP.CAR.3	The RUC Processing subsystem shall calculate the RUC for undifferentiated miles at the mileage rate for the RuleID for undifferentiated miles, as determined by the state in which the vehicle is registered.
TP.CAR.4	The RUC Processing subsystem shall create one unique transaction record for each day's mileage record received, and that record shall be assigned a unique number. Numbers for each transaction shall be assigned so as to support auditing that there are no gaps in the transaction record.

Function 4: Archive (store) all mileage messages received, including incoming timestamp and RUC applied/fuel tax credit computed

Requirement #	Description
TP.AMM.1	The RUC Processing subsystem shall archive (store) Mileage Messages.
TP.AMM.2	The RUC Processing subsystem shall store the version of the RUC Rate Table used with each RUC calculation.
TP.AMM.3	The RUC Processing system shall maintain a sequential transaction log.
TP.AMM.4	The RUC Processing system shall destroy the saved mileage messages location and daily metered use information not later than 30 days after completion of payment processing, dispute resolution for a single reporting period or a noncompliance investigation, whichever is latest. Unless otherwise agreed to by the RUC payer.
TP.AMM.5	The contractor shall have a way to flag a VIN on an account to identify if there is an issue on the account which is being researched. By flagging this VIN, the account will not purge the related mileage data until the flag is removed.

Requirement #	Description
TP.AMM.6	If the RUC Payer has not expressly consented, in the manner prescribed in the contract between the Contractor and ODOT, to the retention of location and daily metered use data, the contractor shall have a method to determine the appropriate RUC Payer data for purging (destruction) location and daily metered use information not later than 30 days after completion of payment processing, dispute resolution for a single reporting period or a non-compliance investigation, whichever is latest.

Function 5: Transmit RUC information to the RUC Processing account management component

Requirement #	Description
TP.TRI.1	The Transaction Processor component shall send the mileage and RUC data to the Account Management Component.
TP.TRI.2	The Transaction Processor shall send any computed Fuel Tax credit based on fuel usage to the Account Management component.
TP.TRI.3	The Transaction Processor shall send any error and event information associated with the mileage and RUC data to the Account Management component.

Function 6: Use rate table from managing entity

Requirement #	Description
TP.URT.1	The RUC Processing subsystem shall maintain the rate table as specified by the Agency or entity.

Function 7: Validate mileage message for: MRD-VIN, total miles driven vs. road usage charge rate code, complete message, and accumulated miles are incrementing logically

TP.VMM.x are represented as Error Event Code 101-107 in the ICD. Supporting documentation that provides error descriptions, flow diagrams and use case scenarios are provided in Appendix B.

Requirement #	Description
TP.VMM.1	The transactions processor shall verify that the VIN number and the MRDID in the message correspond to the MRD ID number associated with the VIN as stored in the RUC Processing account.
TP.VMM.2	Data validation shall occur in transactions processing. Data validation is comprised of: MRD-VIN validation; total miles driven vs. mileage driven in each MRID; validate that message is complete; validate that accumulated miles are incrementing logically.

Requirement #	Description
TP.VMM.3	The RUC Processing subsystem shall perform the following reasonableness/sanity checks on the data in the Mileage message: • Message IDs are increasing, and there are no gaps in sequence numbers. • Check that VIN and MRD ID correspond to values in same account as stored by RUC Processing values in database. • Check that date/time and mileage is increasing. • Check that the Rule ID ("Zone") is valid.
TP.VMM.4	The RUC Processing subsystem shall record message errors and failures and send a message to the Data Collection system as specified in the ICD.

Function 8: Compute fuel tax credit based on optional fuel usage data

Requirement #	Description
TP.FTC.1	The RUC Payer Account Management component shall provide the capability to generate a fuel tax credit based on the number of tax-liable miles traveled, using the EPA average mileage rate based on vehicle parameters for the vehicle associated with the account and MRD. See Appendix A for detail.
TP.FTC.2	If the fuel consumption is reported in the Mileage Message for a given vehicle, the RUC Payer Account Management component shall calculate a fuel tax credit based on this value. See Appendix A for detail.

Component: RUC Payer Account Management

Function 1: Receive RUC information from transactions processor

Requirement #	Description
RPAM.RRI.1	The Account Management component shall receive mileage and tax information from the Transactions Processor.
RPAM.RRI.2	The Account Management component shall receive error and event information from the Transactions Processor.

Function 2: Account setup by the RPs and account closeout

Requirement #	Description
RPAM.ASC.1	The Account Management component shall allow account setup and account closeout.

Requirement #	Description
RPAM.ASC.2	The Account Management component shall validate that the MRD ID is the correct MRD ID for the VIN in each mileage message. If an MRD ID-VIN mismatch is discovered in a mileage message, the RUC Payer Account Management component shall log and report the error as described in the ICD.
RPAM.ASC.3	The Account Management component shall be able to handle accounts that have multiple vehicles associated with them.
RPAM.ASC.4	The Account Management component shall request the reason for account closeout from the RUC Payer, and if the RUC Payer responds, the Account Management system will include this information in the VIN list as specified in the ICD.

Function 3: Administration of RUC Payer attributes (contact details, vehicle/MRD information, billing details)

Requirement #	Description
RPAM.ARA.1	The Account Management component shall support maintenance (adding, deleting or updating) of RUC Payer account information, including VINs (for one or more vehicles) and associated RUC Payer information.
RPAM.ARA.2	The RUC Payer information maintained by the RUC Payer Account Management component shall include, at a minimum, all information provided on the RUC Payer application.
RPAM.ARA.3	For each vehicle associated with a RUC Payer account, the following information, at a minimum, shall be stored in the database: • Vehicle Identification Number (VIN) • MRD ID • MRD Model / Hardware Version Number • MRD Firmware Version Number • Rule ID (“Zone”) Map Version Number (if applicable) • All Configurable MRD Parameters • Current RUC Due (or Credit) • All Mileage Messages, up to data retention limit • All Configuration/Status Messages • All Payment Records • Billing Adjustments to Account • License Plate • MRD Certification Identification Number “CertID”
RPAM.ARA.4	The RUC Payer Account Management component shall provide a secure online service interface for RUC Payers to check the status of the RUC Payer’s account.
RPAM.ARA.5	The RUC Payer Account Management component shall maintain a record of all RUC Payer account information, and mileage/configuration messages.

Requirement #	Description
RPAM.ARA.6	The RUC Payer Account Management component shall log each change to account information, with identification of the person or system process making the change, the reason for the change, and previous values of all fields changed.
RPAM.ARA.8	The RUC Payer Account Management component online service shall be able to handle a load of 7,500 (150% of the program participant volume) simultaneous hits.
RPAM.ARA.9	The RUC Payer Account Management component shall have the ability to add a text based comment to the account, for the Account Manager to enter comments as necessary.

Function 4: Claims management, including incorrect payment claims as well as refunds/credits for fuel taxes

Requirement #	Description
RPAM.CMG.1	The RUC Payer Account Management component shall provide claims management, including incorrect payment claims.
RPAM.CMG.2	The RUC Payer Account Management component shall provide the capability to manually add an adjusting entry to the account for changes in miles, fuel, RUC or fuel tax credit amounts.
RPAM.CMG.3	The RUC Payer Account Management component shall apply the fuel tax credit to the account.

Function 5: Billing to RPs

Requirement #	Description
RPAM.BLL.1	The RUC Payer Account Management component shall provide billing to RUC Payers.
RPAM.BLL.3	The RUC Payer Account Management component shall generate RUC Payer invoices on a periodic basis, and make statements available to the RUC Payer.
RPAM.BLL.4	The RUC Payer Account Management component shall maintain a record of statements generated and the ability to regenerate past statements.

Function 6: Collection of all RUC and any fines

Requirement #	Description
RPAM.CTF.1	The Account Management component shall record all payments to the RUC Payer account.
RPAM.CTF.2	The Account Management component shall support payment types offered by the contractor for RUC account payments.

Requirement #	Description
RPAM.CTF.3	The Account Management component shall have the capability of applying a fine on an account, to be defined by RUCA for ODOT administrative purposes.

Function 7: Pay to Oregon Treasury on a periodic basis

Requirement #	Description
RPAM.CNB.1	The Account Management component shall be able to calculate the Road Usage Charges owed to the state, the Fuel Tax Credit owed to RUC Payers, and the net balance.

Function 8: Notify Road Usage Charge Accounting of payment to Oregon Treasury

Requirement #	Description
RPAM.NPO.1	The RUC Payer Account Management component shall transfer summary mileage and RUC payment information to the Road Usage Charge Administration subsystem on a periodic basis as specified by the Tax Reporting Interface section of the Interface Control Document and as specified by the contract with ODOT.

Function 9: Subsystem availability and error handling

Requirement #	Description
RPAM.SAV.1	The RUC Payer Account Management component shall have high availability (99.9% uptime).
RPAM.SAV.2	For each day in which no daily miles have been reported the RUC Processing subsystem shall generate an error for reporting to ODOT (ErrorEventCode 100, per the ICD). It shall be determined that no miles have been reported to the RUC Processing subsystem under the following circumstances: • After no valid mileage messages have been received for 1 month • If no valid mileage message has been received for any days between valid mileage messages received. Examples include: Device disconnected then reconnected; Device replaced.

Function 10: Send VIN list and data file reporting to Road Usage Charge Administration subsystem

Requirement #	Description
RPAM.SVN.1	The RUC Payer Account Management component shall report a summary of all registered VINs to the RUC Administration subsystem on a periodic basis as defined in the ICD.

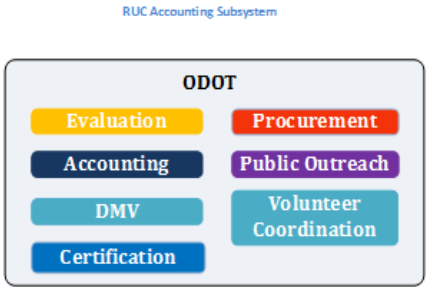
Requirement #	Description
RPAM.SVN.2	The RUC Payer Account Management component shall, upon request from the RUCA for the purpose of compliance investigations, provide all mileage messages for a specified group of VINs (or for all VINs in its database) for a specified range of dates to RUCA, subject to data that is retained.
RPAM.SVN.3	The RUC Payer Account Management component shall report to the RUC Administration subsystem all errors and events associated with each VIN for a given reporting period as specified by the contract with ODOT, along with the date upon which the error or event occurred, as specified by the ICD.
RPAM.SVN.4	Messages from the RUC Payer Account Management component to the Road Usage Charge Administration subsystem shall conform to the Interface Control Document for that interface.
RPAM.SVN.5	The RUC Payer Account Management component shall log all summary messages sent to the RUC Administration subsystem.
RPAM.SVN.6	The RUC Payer Account Management component shall report to the RUC Administration subsystem the Account and VIN Updates associated with each VIN for a given reporting period as specified in the ICD. Account and VIN updates made to RUC Payer accounts are to be reported within 48 hours.
RPAM.SVN.7	The RUC Payer Account Management component shall report to the RUC Administration subsystem the Mileage and RUC Revenue associated with totals of VIN activity for a given period, as specified in the ICD.
RPAM.SVN.8	The RUC Payer Account Management component shall store RUC Administrative data for reporting purposes. RUC Administrative data to be stored, at a minimum, are: ▪ AMID – Account Manager Identification Number, to be assigned by the Agency (as defined in the ICD) ▪ CertID – Certification Identification Number, to be assigned by the Agency for each MRD certified for RUC mileage collection (as defined in the ICD)

5. Road Usage Charge Administration Subsystem Requirements

5.1 Subsystem Overview

This section provides an overview of the Road Usage Charge Administration Subsystem (RUCAS) being specified in this document. The RUCAS shall be managed by a Road Usage Charge Accounting team (RUCA), a unit within the Oregon Department of Transportation assigned to manage the Road Usage Charge Program.

A central RUCAS system or database will be required to store received and processed data from AMs and disbursements to program participants.



Subsystem Purpose

The purpose of the RUC Accounting subsystem is to provide an automated tool for the RUC Accounting team to verify AM compliance with the program. The RUC Administration subsystem will provide assurance to ODOT that account managers are in compliance with legislation, that volunteer RUC Payer vehicles are enrolled in the system, that revenues are being collected, and that the RUC Program is performing all functions designed and required by the contracted scope. The RUC Administration subsystem will also provide a basis for review of information which may be part of initial and recertification of Account Managers.

These objectives are listed below:

- ***Objective 1: RUC Accounting Internal Testing and Reconciliation*** - The primary purpose of the system is to receive, reconcile and analyze reports from Account Managers. This provides the RUC Accounting team the ability to verify several levels of program compliance as well as review program level activity. Additionally, information received can be reconciled to remittances with the Oregon Treasury. This primary system objective supports the additional RUC Accounting team objectives.
- ***Objective 2: RUC Processing Audits*** – The second objective is to provide a basis for auditing. It includes review and testing of the Account Manager's systems and accuracy to record mileage and perform calculations. Auditing may also occur as a function of the certification process. Auditing by the RUCA will also include analysis and review of AM reporting for the purpose of reviewing RUC Payer compliance. RUCA will work with the AM and RUC Payers directly depending on the results of this analysis.
- ***Objective 3: AM Initial Certification and Periodic Recertification*** – The RUC Accounting team or other ODOT representative will participate in the initial certification and recertification of Account Manager's (AMs) based on ODOT contract tender terms and conditions.

5.1.1 Software Overview

ODOT will determine the specifications for this subsystem to support the RUC Accounting team objectives through the review of internal applications, or Commercial off the Shelf (COTS) software. The requirements for this software may be met by one or more applications or report generators. The team will require a database application to receive, evaluate, store and report the results of AM monthly submissions. Some of the reports identified for the RUC Administration subsystem may be made available to AMs so that they can monitor the health, functionality and performance of their systems.

The RUC Administration subsystem performance is expected to meet the daily business needs of the RUC Accounting team for their use. Since more than one system may be employed, the performance may vary by module.

The RUC Administration subsystem is internal processing software for ODOT, which will not compromise AM systems. The selection of the RUC Administration subsystem will comply with ODOT security standards.

5.2 Subsystem Requirements

While field audit is not a 24/7 operation, the RUC Administration subsystem is expected to receive and record transmissions from AMs at regular intervals. Processing and reconciliation of AM communications is expected to be conducted during the normal workday.

RUCAS auditors will take advantage of “auditing through” the AMs records. The RUCAS processing and funds settlement functions will be based on a database of AM reports and RUCAS reports and will be auditable.

Subsystem Context

The following block diagram provides an example implementation of the RUC Administration Subsystem.

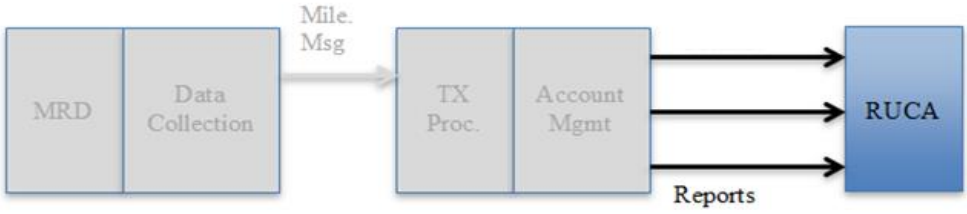


Figure 5: RUC Administration Subsystem

5.2.1 Detailed Functional Requirements

Subsystem: Road Usage Charge Administration

Component: Road Usage Charge Administration Subsystem Functions

Function 1: Verify that ODOT has received all Road Usage Charges owed from the AMs.

This function of the subsystem provides the ability to verify report receipt, validate tax reported and paid, and provide necessary information for the reconciliation with Oregon Treasury deposits.

Function 2: Receive scheduled reports list and accounting/statistical data from RUC Payer account management

This function of the subsystem provides the ability to receive reports as outlined in the ICD and analyze reports from each Account Manager. It will assist the RUC Accounting team to determine anomalies and investigate further.

Function 3: Monitor AM accounts

This function of the system involves creating an account profile for RUC Payers. The intent of this process is to consolidate information per VIN and provide the RUC Accounting team a means to analyze activity and perform claims management.

Function 4: Provide system information for certification

Based upon ODOT's contractual process, the RUC Administration subsystem functions may be used to support testing and certification purposes.

Component: Road Usage Charge Accounting team functions

Function 1: Interface with DMV, including receiving vehicle account (VIN) list from DMV

The team function is to interface with the Oregon DMV in order to validate the RUC application information and provide approval to Account Managers.

RUC Payer application information will be sent to ODOT by the Account Manager in the Account and VIN Update report (defined in the ICD). The RUC Payer application information will be compared against DMV records and RUC program enrollment limits. A status for each application will be returned in the Account and VIN Update Return Data report (defined in the ICD), which will be made available through the REST service for Account Managers. For each RUC Payer application, one of the following values will be assigned: *Approved, Pending, or Denied*.

The *Pending* category applies to applications subject to additional system processing or manual staff review of inconsistencies during verification. Upon completion of review activities, the RUC Payer application status will be updated to one of two values, *Approved* or *Denied*, based on the results from the review. This status update will be included in the following business day's Account and VIN Update Return Data report. *Denied* application statuses will be accompanied by a description of the reason for ineligibility.

Function 2: Provide overall management of the road usage charge accounting functions

The team function is to provide program management for the Oregon Road Usage Charge Program. The Program Manager will interface with the Account Managers on program changes, issues and updates to the processes. Included in this management will be the communication of any RUC Rate Table changes.

Function 3: Perform auditing checks of CSPs (entities that perform RUC Processing)

The function of the team is to periodically audit Account Managers for compliance. Auditing activities may include but not be limited to reviewing of accurate mileage transactions and tax calculations, and reviewing the versions of MRD, software and other IT compliance functions.

Function 4: Provide road usage charge credits for manual gas tax refund requests

The function of the team is also to support RUC Payer requests for manual refunds. The RUC Payer is responsible to provide information when requesting a manual refund which the Accounting Team will review and determine the disposition.

Function 5: Provide certification review

Based upon ODOT's contractual process, the RUC Accounting team may participate in initial or interim testing and certification activities for Account Managers.

Appendix A: RUC Rate Table and Mileage Definitions

The Contractor is responsible to manage the Oregon specific business rules as it relates to the systematic processing of the Road Usage Charges and Fuel Tax Credits. In this section, the functions of the RUC Processing Account Management are further detailed to cover these capabilities. This function involves criteria for requirements that are specific to the Oregon RUC Program. The RUC Rate Table is related to the data required in the Interface Control Document; please refer to the ICD for details on data transmission and formatting.

Oregon Road Usage Charge Rates:

Requirement #	Description
TP.OSM.1	The Account Management component shall use the active current RUC Rate for Oregon Taxable miles.
TP.OSM.2	The Account Management component shall use the active current Fuel Tax Credit rate per gallon in Fuel Usage calculations.
TP.OSM.3	The contractor shall make the tax rates as listed in the RUC Rate Table configurable to support future changes.

Oregon RUC Rate Table

The Oregon RUC Rate Table has a series of criteria to define applicable business rules for the rates and the locations where the rates are applicable. The Oregon RUC Rate Table is provided as an SRS appendix in a separate document.

Rule ID

The Rule ID is associated with a specific FIPS state code for U.S. states and territories. Additionally, the Oregon RUC program is using "00" as a program-specific Rule ID. This Rule ID is for miles which cannot be differentiated and assigned to a specific U.S. state (i.e. “Undifferentiated”).

Rule ID activity is the sum of all Sub Rule ID activity. These relationships are defined in the ICD. By using Sub Rule ID, each Rule ID location (U.S. State) can be defined in such a way as to support multiple taxation locations and sets of business rules.

Sub Rule ID

The Sub Rule ID is a set (one or more) of business rules that apply to a Rule ID. A Sub Rule ID includes, at this time, the following criteria:

- Sub Rule ID number: A sequential number associated with the Sub Rule
- RUC Tax Flag: A Yes or No flag to indicate if RUC Tax is applicable
- RUC Rate Amount: Amount in dollars
- Fuel Tax Credit Flag: A Yes or No flag to indicate if Fuel Tax Credit is applicable
- Fuel Tax Credit Rate: Amount in dollars
- Priority: A distinct positive integer used to indicate the order in which to process the Sub Rule ID rules. The sequential order is set up for each set of Sub Rules under a Rule ID.
- Description: A written statement to describe the Sub Rule objective
- Applicable Rule Dates: Date range to indicate when a Sub Rule is in effect.

Undifferentiated Mileage:

As detailed in the ICD, the Rule ID is a code based off of the FIPS state codes. The numbers 1-98 are reserved for these codes. The number 00 is also used as a Rule ID for RUC calculation, and is designated for undifferentiated mileage.

When an Advanced MRD cannot determine its location (i.e. bad GPS signal) and associate it accordingly, or when a RUC Payer uses a Basic MRD, these miles are defined as "undifferentiated" miles. Undifferentiated miles are assumed to have been driven in the home state and are considered taxable miles to be applied based on the originating state where the vehicle is registered and has an account.

Taxable Mileage:

Miles determined to have been driven on Oregon public roads, and miles that are considered undifferentiated are considered taxable miles and are subject to the road usage charge.

Requirement #	Description
TP.OSM.4	The contractor shall accurately calculate taxable miles. The RUC calculation for Oregon taxable miles is: Count of taxable miles x RUC Rate = Road Usage Charge

Non-public Road Mileage:

Within Oregon, miles driven on non-public roads are not subject to the Road Usage Charge. In the case of Advanced MRDs, non-public mileage may be reported by the MRD and, if so, shall not be reported as taxable mileage driven within Oregon. The capability to report this mileage is dependent on the functionality of the MRD selected by the RUC Payer.

The definition of public roads, per ORS 801.305 (1) is: A highway is defined as "… every public way, road, street, thoroughfare and place, including bridges, viaducts and other structures within the boundaries of this state, open, used or intended for use of the general public for vehicles or vehicular traffic as a matter of right."

The definition of non-public roads used by the Road Usage Charge Program, per ORS 319.320 (1) (a) is: "…any road, thoroughfare or property in private ownership."

If miles cannot be identified as traveled on public or non-public roads, but it can be determined that mileage was traveled on a defined road, the mileage is to be taxable.

Fuel Usage Calculations:

ODOT has determined the methods in which the Contractor shall determine the appropriate MPG amount to use in the Fuel Usage calculation, listed in order. The Fuel Usage calculation is a calculation to determine number of gallons used while traveling a given number of miles for a specific vehicle. The options listed below are based upon the level of accuracy and the capability of a given MRD and/or vehicle. The Contractor shall select which method is most accurate for the specific vehicle/MRD combination.

- ***Calculate by MRD***: If the MRD selected by the RUC Payer has the capability to report the fuel usage of the vehicle, this is the preferred method of calculation.

  Calculate by EPA Rating*:* If the MRD rating is unavailable, the Contractor shall use the Combined EPA fuel economy rating (EPA rating) for a given vehicle, following rules defined in the BRD.

Requirement #	Description
TP.OSM.5	The contractor shall accurately calculate the fuel tax credit. Fuel Tax Credit calculation for vehicles with an MRD with Fuel Usage reporting capability is: MRD Fuel Usage in Gallons x Fuel Tax Credit Rate = Fuel Tax Credit Amount
TP.OSM.6	The contractor shall accurately calculate the fuel tax credit with an EPA rating. The Fuel Tax Credit calculation for vehicles with an estimated (VIN/EPA) Fuel Usage rate is: [(Count of Oregon Miles + Count of Undifferentiated Miles)/ Estimated Fuel Usage Rate in Gallons] x Fuel Tax Credit Rate = Fuel Tax Credit Amount

EPA Fuel Economy Ratings:

In order to use a standard reference across Account Managers, fuel economy ratings per vehicle as determined by the Environmental Protection Agency are to be used, as defined in the BRD. The combined EPA rating for each vehicle will be used as described below.

Requirement #	Description
TP.OSM.8	The contractor shall use the EPA fuel economy data (published at www.fueleconomy.gov) to determine the MPG value for the vehicle. If the MPG value is not published by the EPA, the contractor shall use the best available source to determine MPG. The contractor shall determine MPG based on the following logic: - If the vehicle is powered by gas, diesel or compressed natural gas (CNG), or is a standard hybrid, use the rounded combined MPG value - If the vehicle is fully electric-powered, no MPG rating is to be used - Remaining vehicles are plug-in hybrids, use the rounded combined MPGe value
TP.OSM.9	The contractor shall use the highest combined EPA rate for the vehicle information provided if, with the information provided by the RUC Payer, the exact vehicle cannot be determined.

Rounding of Calculations:
The requirements below provide details for the Contractor to consistently round the outcome of calculation amounts:

Requirement #	Description
TP.ROC.2	The Transaction Processor component shall round the RUC charge to the nearest whole cent. • For the amount equal to or greater than $0.005, round up to the nearest whole cent. • For the amount with less than $0.005, round down to the nearest whole cent Example: $0.0524 would be rounded to $0.05

Appendix B: Data Reporting - Supporting Documentation

Data Reporting Process Flow:

A process flow diagram is provided as part of this Appendix, in a separate document.

Data Reporting Use Cases:

Use Cases are provided as part of this Appendix, in a separate document.

Requirement Clarifications:

REQ #	Original Requirement Description	ODOT Clarification
MRD.RMT.6	If the data collection is not integrated into the MRD, in the absence of reportable miles for any given day, the MRD shall provide positive notification to data collection that the MRD is still operational for each day the MRD is operating and has communications.	The point of this requirement is to require the device to try to communicate at least daily. It's not absolutely required, to allow for lower cost communications options. Bottom line, if the car is connected to the internet, it needs to send data at least daily.
DC.CPM.3	Data must be reported to the RUC Processing subsystem at least once a month and must be reported for each day in the month.	This requirement works with MRD.AMT.7; We understand that it is impossible to guarantee delivery monthly. But the system needs to be designed in a way to meet the 99% SLA. Also, for cloud based Data Collection, the data received should be sent to the RUC Processing subsystem daily.
DC.FSM.8	The Data Collection component shall include accumulated mileage data, and if available, accumulated fuel usage data, for all complete days since the last day reported in the most recently acknowledged mileage message.	This also means that the data must be stored until the full day has been received.
RPAM.SVN.3	The RUC Payer Account Management component shall report to Road Usage Charge Accounting all errors and events associated with each VIN for a given reporting period as specified by the contract with ODOT, along with the date upon which the error or event occurred, as specified by the ICD.	Data reported to ODOT is based on the day the mileage messages were reported to the Transaction Processor, regardless of the day the miles were driven.
RPAM.SVN.7	The RUC Payer Account Management component shall report the RUC Revenue associated with totals of VIN activity for a given period, as specified in the ICD.	Data reported to ODOT is based on the day the mileage messages were reported to the Transaction Processor, regardless of the day the miles were driven.

Data Transmission Details:

COMPONENT	WHAT TO SEND	WHEN TO SEND
MRD / Mileage Collection	• Distance, fuel, errors, connects/disconnects • Proprietary data • For that MRD only	• Minimum of every 30 days • Connect events (immediately, or as soon as there is a connection) • As frequently as needed by operator for their value added services.
Data Collection	• Distance, fuel, errors, connects/disconnects in mileage message by day. • For all MRDs that have reported any complete days.	• Daily • Connect events • Note: not all MRDs will have data
Transaction Processor	• Transactions	• As processed (account managers discretion)
RUC Processing	• Mileage and RUC Revenue • VIN Summary • Errors and Events • Filter range is based on when received by the RUC Processing subsystem (TransmittedTimestamp), not when driven (ReportDate).	• Weekly • Monthly • Quarterly