

Driving Report Interface Control Document

August 2019

Hawaii Road Usage Charge Demonstration

with



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Definitions & Abbreviations

TERM/ABBREVIATION	DEFINITION/DESCRIPTION	REMARKS
AES	Advanced Encryption Standard	
Component	A subsystem component is a modular part of the subsystem that serves specific activities or tasks	
ConOps	Concept of Operations	
Datawarehouse	The database developed for the Part 1 Demonstration but also used for Part 2 to store Participant travel data used to generate Road Usage Reports.	
Demonstration Project	The terms refer to the HiRUC Demonstration, including both parts 1 and 2	
DC	Data Collection	
DIT	Honolulu City & County Department of Information Technology	
Driving Report (DR)	A report of miles travelled, gas taxes paid, and RUC sent by mail to vehicle owners in Part 1	
ECU	Engine Control Unit	
EPA	Environmental Protection Agency	
FIPS	Federal Information Processing Standard, which includes two-digit numerical codes for each U.S. state/territory.	
FCC	Federal Communications Commission	
Function	Specific tasks accomplished by a system component	
Functional group	Functional groups are high-level objectives of the subsystem component	
GIS/MAP	Geographic Information System	
GPS	Global Positioning Systems	
HDOT	Hawaii Department of Transportation	
HiRUC Administration	Name given to the administrative entity tasked with recruiting Demonstration Participants, verifying the correct computation of road usage charges, and performing any compliance activities recommended by HDOT.	
HiRUC System	The system established for the Part 1 demonstration to generate Road Usage Reports (RURs), comprising a Datawarehouse and a RUR Generator. It will also be used in Part 2.	
HTTP	HyperText Transfer Protocol	
ICD	Interface Control Document	
IP	Internet Protocol	
IT	Information Technology	



TERM/ABBREVIATION	DEFINITION/DESCRIPTION	REMARKS
JSON	JavaScript Object Notation	
LTE	Long-Term Evolution	
Mileage Message	A mileage message is the formatted transaction data, containing mileage, fuel usage and health data, that is exchanged between Service Provider subsystems.	
Mileage Meter	A Mileage Meter is a device or inbuilt system that collects road usage charge information for the vehicle in which it is installed	
Mileage Reporting Technology	The actual technology underlying a Mileage Reporting Method, either a plug-in device, odometer image capture system (an app with front and back ends), or Native Automaker Telematics	
MRD	Mileage Reporting Devices	
MRM	Mileage Reporting Method, a means of recording and reporting miles travelled, either a plug-in device (OBDII), odometer image capture system, or Native Automaker Telematics.	
MTBF	Meantime Between Failures	
MVerity	Vehcon's patented system for odometer image capture and validation, which the Service Provider will use for odometer image capture.	
Native Automaker Telematics	A telematics system installed by the carmaker at the time of manufacturing, providing a secure data interface to the vehicle electronics, including odometer, used here as a Mileage Reporting Method.	Abbreviated NAT
OBDII	On Board Diagnostics II, the CARB/EPA standard for vehicle data interfaces included in all US vehicles built after 1996.	
Odometer Charge	Reporting odometer images periodically as a Mileage Reporting Method, also called Odometer-based Reporting.	Abbreviated OdoPhoto
Odometer Message	An odometer message is the formatted transaction data, containing odometer data that is exchanged between subsystems	
Odometer-based reporting	Reporting odometer images periodically as a Mileage Reporting Method, also called Odometer Charge.	Abbreviated OdoPhoto
Part 1	The Manual Demonstration, in which Hawaii residents receive a Driving Report based on their odometer readings collected during safety inspections. Not included in this specification.	
Part 2	The Automated Demonstration, in which ~2,000 Participants receive Road Usage Reports over the 9-month Demonstration based on a variety of Mileage Reporting Methods. Included in this specification	
Participant	A volunteer who has enrolled in the Part 2 (Automated) Demonstration	



TERM/ABBREVIATION	DEFINITION/DESCRIPTION	REMARKS
PID	Plug-in Device, an OBDII device with or without location, a Mileage Reporting Method.	Abbreviated PID (either with or without location information), OBDDoc (includes location information) or OBDDoc (no location information)
PII	Personally Identifiable Information	Defined in business rules
PMVI	Periodic Motor Vehicle Inspection	
REST	Representational State Transfer	
RPAM	Demonstration Participant Account Management	
RUC	Road Usage Charge	
Rule ID	RuleID is the code for the location (area) where the mileage is driven. All RuleID's refer to entire states, provinces, counties, or other jurisdictions, except 00, which refers to mileage driven for which there is no location data (state cannot be determined).	
RUR	Road Usage Report, a periodic statement of driving data in PDF format sent to Participants by the Part 2 Service Provider.	
RURG	Road Usage Report Generator, the component of the HiRUC system (developed for the Part 1 Demonstration but also used in the Part 2 Demonstration) that creates Road Usage Reports based on travel data stored in the Datawarehouse.	
SP	Service Provider, the firm that provides mileage collection and account management services for the Part 2 Demonstration, reports data to the HiRUC Administration and HiRUC system, and has a direct interface with the Participants.	
SRS	System Requirement Specification	
SubRule ID	SubRule ID distinguishes between chargeable (public on-road) and non-chargeable miles driven within a given Rule ID.	
TCP	Transmission Control Protocol	
TP	Transaction Processor	
UBI	Usage-based Insurance	
Undifferentiated	Miles for which location data is not available, recorded in RuleID 0, considered to be chargeable miles.	
VIN	Vehicle Identification Number, a unique serial number for each vehicle, standardized as a 17-digit alphanumeric code since 1981.	
VMT	Vehicle Miles Travelled	

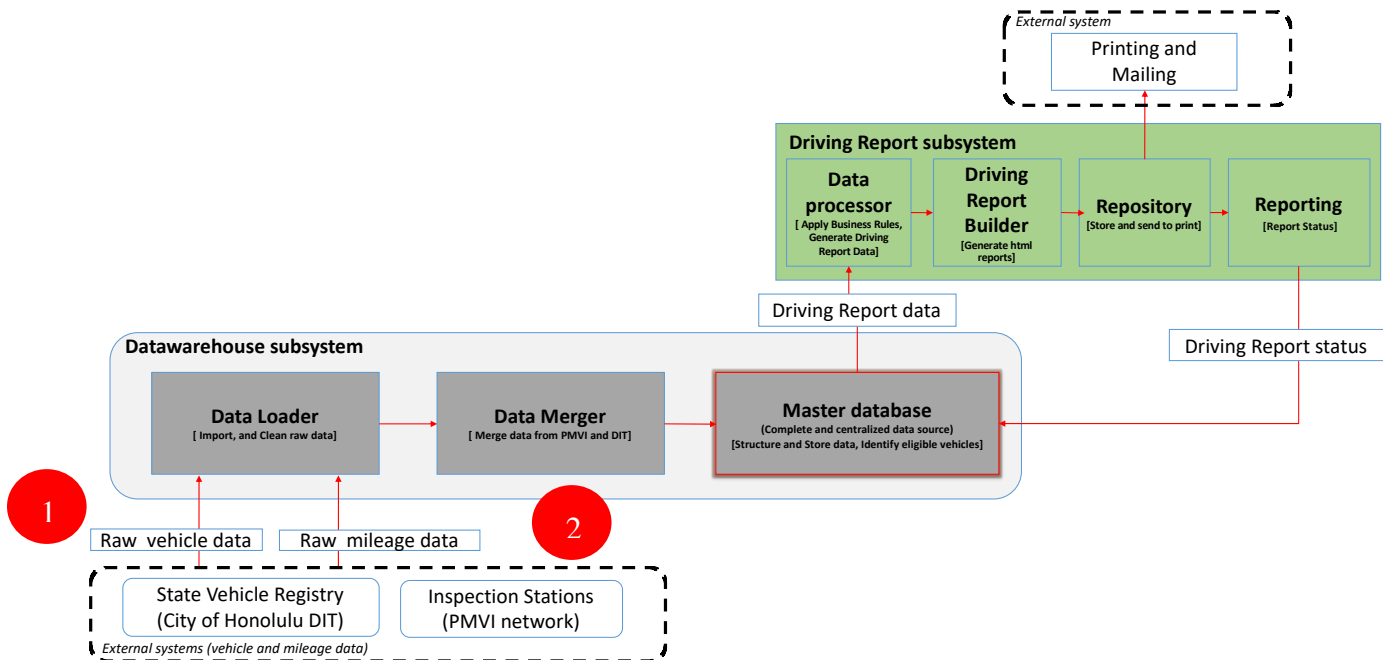
1. Data Interfaces Described in this Document

This document provides high-level descriptions of two interfaces into the HiRUC System for the Part 1 Demonstration:

1. The interface from the State Vehicle Registry, the City of Honolulu DIT, and
2. The interface from the Inspection Stations, the PMVI network

These are indicated in the HiRUC system architecture diagram below:

Figure 1: HiRUC System Components



2. Interface Between PMVI Subsystem and Datawarehouse Subsystem

This is the interface #1 from the diagram above.

2.1. Data Transfer via SFTP

PMVI data files will be made available at a designated secure FTP (SFTP) site hosted by the PMVI data provider. Files will be retrieved via a SFTP client (e.g. FileZilla), using credentials provided by the PMVI data provider. The Datawarehouse Subsystem will retrieve the files at pre-determined intervals (e.g. monthly).

2.2. Data File Content and Naming

- ▶ Each data file will be a .csv “flat file”, including data field labels in the first row (“header” row).
- ▶ *Data will be UTF-8 encoded, with comma delimiters, double-quotes enclosing each data item, and \n (0x0A) end of line character.*
- ▶ *Diacriticals and ‘null’ characters (0x00) should NOT be used in the file.*
- ▶ *Refer to the “PMVI Data Dictionary” for the data fields to be included in each record (row).*
- ▶ *The file name format will be:*
 - > HI_Stations_Inspection_YYYYMMDD_AAAABBCC.csv
 - YYYYMMDD = Year, Month, and Day of the earliest inspection record in the file (e.g. “20190301” = March 1, 2019)
 - AAAABBCC = Year, Month, and Day of the latest inspection record in the file (e.g. “20190331” = March 31, 2019)
- ▶ *Files should NOT have a date overlap, i.e. a given inspection data record (row) should not appear in multiple files.*

3. Interface between DIT Subsystem and Datawarehouse Subsystem

This is the interface #2 from the diagram above.

3.1. Data Transfer

DIT data files will be made available at a designated secure FTP (SFTP) site hosted by the DIT data provider. Files will be retrieved via a SFTP client (e.g. FileZilla), using credentials provided by the DIT data provider. The Datawarehouse Subsystem will retrieve the files at pre-determined intervals (e.g. monthly).

3.2. Data File Content and Naming

- ▶ Each data file will be a .txt “flat file”, without data labels (e.g. no “header” row).
- ▶ Data will be UTF-8 encoded, with “pipe” character (0x7C) delimiters, no enclosing characters, and \n (0x0A) end of line character.
- ▶ Data fields may be padded with spaces (0x20).
- ▶ Diacriticals and ‘null’ characters (0x00) should NOT be used in the file.
- ▶ Refer to the “DIT Data Dictionary” for the data fields to be included in each record (row).
- ▶ The file name format will be:
 - > HDOTYYYYMMDD.txt
 - YYYYMMDD = Year, Month, and Day of the earliest inspection record in the file (e.g. “20190301” = March 1, 2019)
 - AAAABBCC = Year, Month, and Day of the latest inspection record in the file (e.g. “20190331” = March 31, 2019)
- ▶ Each file should be a complete, as-current file including all DIT vehicle registration records.

4. Interface between Mail House Subsystem and Datawarehouse Subsystem

4.1. Data Transfer via SFTP

Data files to support printing of Road Usage Reports (RUR) will be delivered to the Mail House Subsystem at a designated secure FTP (SFTP) site hosted by Mail House Subsystem provider. The Datawarehouse Subsystem access the system using credentials provided by the Mail House Subsystem provider, and will post the RUR Data Files to the SFTP site at pre-determined intervals (e.g. monthly).

Data files reflecting the printing and mailing status of RUR will be posted to the same SFTP site by the Mail House Subsystem provider. Files will be retrieved manually via a SFTP client (e.g. FileZilla), using credentials provided by the Mail House Subsystem provider. The Datawarehouse Subsystem will retrieve the files at pre-determined or ad-hoc intervals, typically within 5 business days following each RUR printing cycle.

4.2. Data File Content and Naming – RUR Data Files

- ▶ Each data file will be a .csv “flat file”, including data field labels in the first row (“header” row).
- ▶ Data elements in the file will be ASCII strings, representing the “variable” data required for the RUR for the applicable vehicle segment.
- ▶ Separate data files will be submitted for each vehicle segment.
- ▶ Refer to the “Driving Report File Spec” for the data fields to be included in each record (row).
- ▶ The file name format will be:
 - > HIRUC_DR_Data_{segment}_YYYYMMDD_X.csv
 - YYYYMMDD = Year, Month, and Day that the file was prepared
 - {segment} = the vehicle segment (and thus the RUR template) the file is supplying data for
 - X = a sequential number, starting at 1, for the revision level of the file (will usually be “1” unless an error requires a revision and re-upload)

4.3. Data File Content and Naming – Mail Status Files

- ▶ Each data file will be a .csv “flat file”, including data field labels in the first row (“header” row).
- ▶ Data elements in the file include the RUR ID for each report, along with a boolean value (true/false) indicating whether the RUR was successfully processed (i.e. printed and mailed).
- ▶ The file name format will be:
 - > HIRUC_Mail_Status_{segment}_YYYYMMDD_X_Y.csv



where “{segment}_YYYYMMDD_X” matches the file name of the RUR Data file that the status report is responding to

Y = a sequential number, starting at 1, for the revision level of the file