



RUFTF Pilot Project

- Who are we – Introduction of Project Team
- RUFTF Pilot Project Objectives
- Project Schedule
- Project Scope – Technology Configurations
- At the end of the First year...

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Task Force



The RUFTF Pilot Project Team

- System Owner / Manager – Jim Whitty
- Project Manager – Benny Sexton, Chuck Larsen
- RUFTF Pilot Steering Committee
 - Jim Whitty, ODOT RUFTF Admin. (Chair)
 - Ron Winterrowd, ODOT, Information Systems Manager
 - Quintin Hess, ODOT Gas Tax Unit Manager
 - Bernie Jones, ODOT Research Unit Manager

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RUFTF Pilot Project Team (cont.)

- Prototype Device Development Project Team:
 - Oregon State University, Dept. of Industrial and Manufacturing Engineering
 - David Kim
 - David Porter
- Subject Matter Experts:
 - Jack Svadlenak, ODOT Policy Section
 - Alan Kirk, ODOT Research Group



RUFTF Pilot Project Objective

- Develop, integrate, test and document specific technology configurations that incorporate **multiple concepts** for on-vehicle devices, fee calculation and collection.
- The **purpose** is to demonstrate the feasibility of an electronic revenue collection system to gain further understanding of the actual Pros/Cons of various concepts.

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1st year: develop, integrate, test and document specific technology configurations that incorporate multiple concepts for on-vehicle devices, and fee calculation and collection.

ID	Task Name	2003												2004		
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
1	Road User Fee Pilot Requirements	█														
2	Develop GPS/RF-AVI prototype device			█												
3	Develop ODO/RF-AVI prototype device				█											
4	Test GPS/RF-AVI & POS System Integration / Central Computer System				█											
5	Test ODO/RF-AVI & POS System Integration / Reset VMT counter				█											
6	Test Working GPS/RF-AVI & ODO/RF-AVI, Prototypes											█				
7	Final Report														█	
8	Prepare for Large Pilot											█			...	

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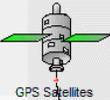
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Technology Configuration to be Developed

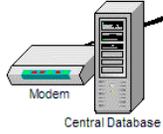
- GPS / RF-AVI prototype device
 - Will use one-way RF Communications to transfer Oregon VMT to Service Station POS System and Central Computer system which computes the proper VMT Fee.
- Odometer/RF-AVI prototype device
 - Will use two-way RF Communications to transfer Oregon VMT to service Station and reset or zero the ODO/RF-AVI on-vehicle device

GPS / RF-AVI Devices Configuration



GPS Satellites

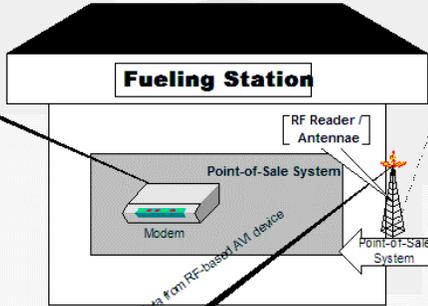
Direct Connect or Dial up Land Line



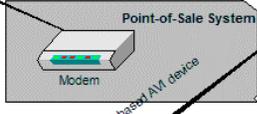
Central Database

TWO Way Communication between POS and Central Database

- 1) The Fueling Station sends the Central Database VMT data.
- 2) Central Database uses VMT to calculate VMT Fee to charge.
- 3) Central database returns Proper VMT Fee to Point-of-Sale System.



Fueling Station



RF Reader / Antennae

RF Reader / Antennae
RF Reader interfaces with the Point-of-Sale System, not the Fuel Dispenser

One way Communication - VMT Data from RF-based AVI device

GPS Technology - collects VMT data and stores in memory of a RF-based AVI device.



Vehicle's Speed Sensor

RF-based AVI device -

While Vehicle is driving:

GPS VMT readings are stored on the RF-based AVI device.

When a vehicle is fueling:

- 1) VMT data will be read off the RF-based AVI device by a RF reader installed at the fueling station.
- 2) POS at the service station will contact the Central Database sending VMT data.
- 3) The central database calculated the proper FEEs and sends them back to the Point-of-Sale to compute the proper fee to charge for fuel.

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Integrated GPS/RF-AVI Prototype Device

- Uses GPS technology to collect Oregon VMT.
- The on-vehicle device must contain geographic information to distinguish when a vehicle is inside or outside of Oregon.
- The on-vehicle device could contain geographic information to distinguish different pricing zones within Oregon and have the ability to collect VMT driven within each zone.
- The collected VMT will be written to the memory of a RF-based AVI device which continually stores VMT for each pricing zone within Oregon.

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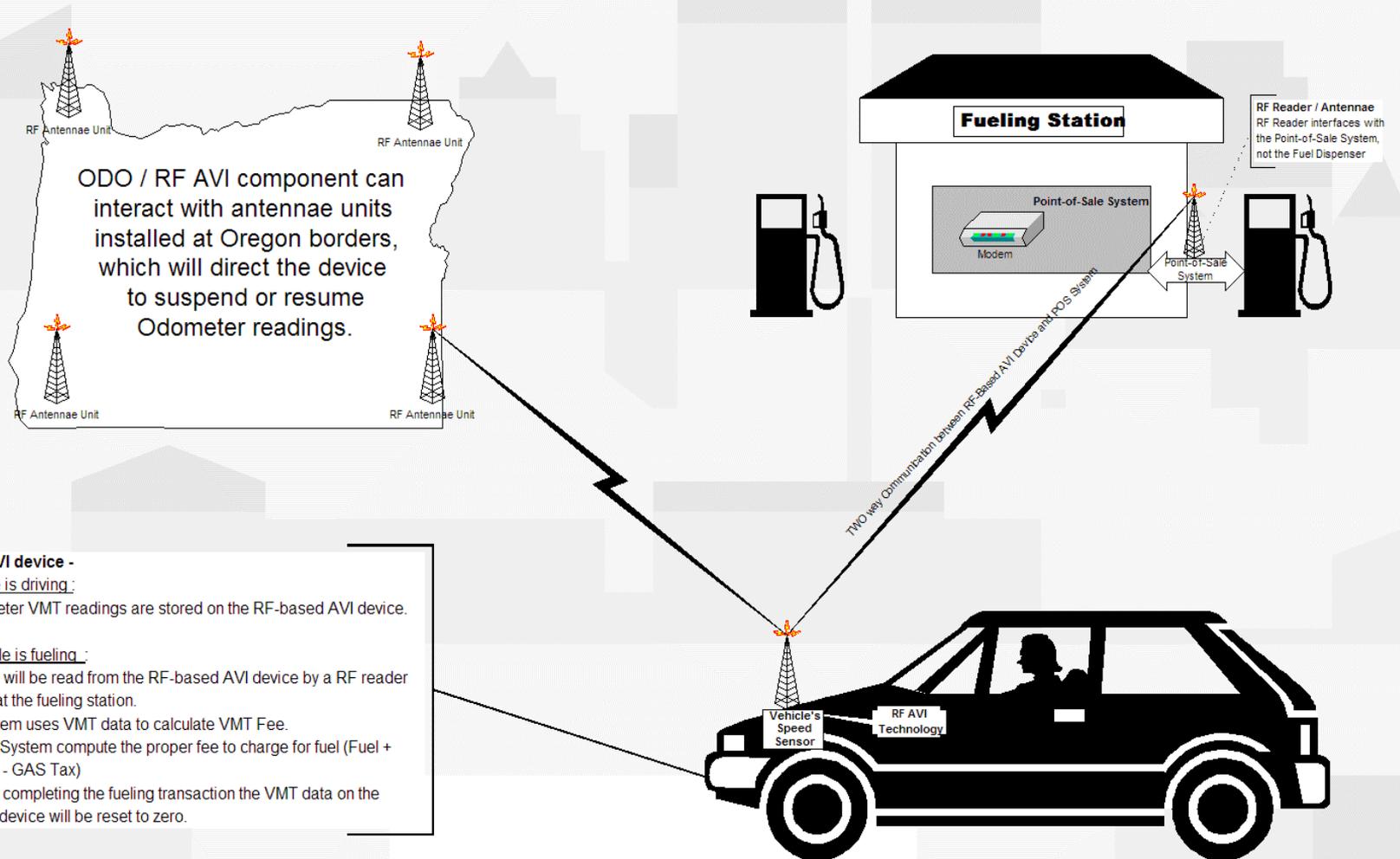
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Integrated GPS/RF-AVI Prototype Device

(cont.)

- When a vehicle is fueling, VMT data will be read off the RF-based AVI device by a RF reader installed at or near the fuel dispenser.
- Service station POS system will send the Oregon VMT data to a central processing computer
- The central computer will calculate the proper VMT fee and send it back to the service station POS system.
- The proper fee will then be incorporated into the fuel purchase.



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Integrated Odometer/RF-AVI Prototype Device

- The integrated Odometer/RF-AVI Prototype Device is considered a first step in the development of an integrated GPS/Odometer/RF-AVI prototype device.
- This device will use information from a vehicle's speed sensor to collect Oregon VMT.
- The device must have the ability to suspend VMT collection as a vehicle leaves Oregon, and resume VMT collection when the same vehicle enters Oregon.
- This will be accomplished by integrating the speed sensor information processing functions with a RF-AVI device.

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Integrated Odometer/RF-AVI Prototype Device

(cont.)

- This RF-AVI component can then interact with antenna units installed at Oregon borders, which will direct the device to suspend or resume VMT collection.
- When a vehicle is fueling, VMT data will be read off the RF-based AVI device by a RF reader installed at the fuel dispenser.
- The POS at the service station will then use this data to compute the proper fee.
- As part of completing the fueling transaction the VMT data on the Odometer/RF-AVI Prototype Device will be reset to zero.

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- Other technologies being developed and tested in this project:
 - **Fuel dispensers** and their accompanying point-of-sale (POS) systems must be programmed to work with these devices.
 - **Radio frequency (RF) readers** must be installed near fuel dispensers, and programmed to obtain the VMT data off the devices and send this data to the POS System, or to reset device mileage.
 - The **POS system must be programmed** to interact with the **central database** when computing to the total fuel purchase cost and adding a VMT fee.
 - **RF Antenna** units installed at Oregon borders will trigger the RF-AVI devices to suspend or resume VMT collection.

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At the end of the 1st year...

- The project will have learned more about the feasibility of implementing a VMT-based electronic revenue collection system, and about the various technology options that may be used as part of such a system.
- The project will also be prepared to begin testing of a developed technology configuration to support the VMT-based system with a large pilot group (approximately 400 Oregon drivers).

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At the end of the 1st year...

(cont.)

- The project will be able to identify the necessary system integration tasks to enable the configuration of the required fueling station.
- The project will be able to use the requirements and specifications generated by this project so any number of manufacturers can be used to produce the device.
- These requirements and specifications can also be disseminated to other transportation agencies interested in establishing alternative technology-based fee collection programs.



Questions

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