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Wireless Roadside Inspection (WRI) Phase 2: Pilot Test

The U.S. Department of Transportation (DOT) Federal Motor Carrier Safety Administration (FMCSA) has commissioned the Wireless Roadside Inspection (WRI) Program to validate technologies and methodologies that can improve safety through inspections using wireless technologies that convey real-time identification of commercial vehicles, drivers, and carriers, as well as information about the status of the vehicles and their drivers. It is hypothesized that these inspections will:

- Increase safety – Decrease the number of unsafe commercial vehicles on the road;
- Increase inspection efficiency — Speed up the inspection process, enabling more inspections to occur, at least on par with the number of weight inspections;
- Improve Inspection effectiveness — Reduce the probability of drivers bypassing CMV inspection stations and increase the likelihood that fleets will attempt to meet the safety regulations; and
- Benefit industry — Reduce fleet costs, provide good return-on-investment, minimize wait times, and level the playing field.

To this end, the WRI program is defined in three parts

Phase 1: Proof of Concept Test (POC) – Testing of commercially available off-the-shelf (COTS) or near-COTS technology to validate the wireless inspection concept (2006-2008, testing completed August 2007)

- One location
- Two vehicles
- Vehicle to roadside communications

For more information, see http://info.ornl.gov/sites/publications/Files/Pub12285.pdf

Phase 2: Pilot Test – Safety and inspection technology maturation demonstration, system loading, and back office system integration (2008-2011)

- Several vehicles
- Alternative technology
- Multiple communication paths
- Vehicle to back office, back office to roadside communications

For more information, see http://info.ornl.gov/sites/publications/Files/Pub34717.pdf

Phase 3: Field Operational Test (FOT)– Full end-to-end system testing on multiple vehicles from multiple fleets within a multi-state corridor (2012-2017)

- Multi-state corridors
- Fleets and vehicles from several jurisdictions
- Selected technologies (focus on Commercial Mobile Radio Services [CMRS]) Full network (vehicle/roadside/government system)

Pilot Test Goal —The goal of the WRI Pilot Test was to determine wireless commercial motor vehicle inspections using currently-existing telematics technologies and systems. The platform's effectiveness and the commercial mobile radio services (CMRS) method's ability to interface with the Government Back Office System (GBOS) were monitored and objectively evaluated. This goal was to be met by demonstrating the transfer of a CMRS-generated safety data message (SDM)

Research Areas

Freight Flows

Passenger Flows

Supply Chain Efficiency

Transportation: Energy Environment

Safety Security

Vehicle Technologies

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to the GBOS, demonstrating WRI CMRS end-to-end system functionality via two CMRS partner systems, and demonstrating carrier, enforcement, and compliance decision-making using associated WRI graphical User Interface (UI) populated with the CMRS-generated SDM information.

Test and Results — During the Pilot Test, which extended from October 15, 2010 to January 31, 2011, two telematics teams were able to successfully submit SDMs to the WRI GBOS. These SDMs included vehicle identification information, driver identification information, and driver status information. A total of 1,705 messages were submitted during the period and were triggered at two inspection stations and at two domiciles. A self-test feature was also implemented by one of the telematics teams. The Pilot Test was successful in that many SDMs were transferred in real-time from vehicles moving at highway speeds and the primary goal and objectives of the effort were met. The Pilot Test also revealed some critical issues relative to WRI and these issues point to the need for an intermediate step between the recently completed Pilot Test and the planned Field Operational Test. These issues include the need for a GPS boundary solution that can support triggering in corridors that have radiused roadways, neighboring secondary roads and bi-directional traffic to ensure SDMs can be reliably triggered; the need for a pull-in/by-pass function to allow WRI to be used in near-real-time enforcement and interdiction; to overcome the limitations of the Pilot Test GBOS by methodically dissecting the current GBOS and developing a matrix of current functionality, maturity, scalability, and desired WRI production functionality; In addition, revisiting the viability and scalability of using XML as the only method of SDM data transfer to the GBOS should also be studied.

The Pilot Test was heavily supported by leveraged partnerships with private industry. These partners are shown in figures 1 through 3.

Future Work — Plans are currently underway to plan and conducted Phase 3 of the WRI effort.

Figure 1— Pilot Test Fleet Partners

Figure 2— Pilot Test Telematics Partners

Figure 3 — Safety Technology Partners

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