COMMERCIAL MOTOR VEHICLE ROADSIDE TECHNOLOGY CORRIDOR

February 2009

Technology Corridor News

Federal Motor Carrier Safety Administration Office of Analysis, Research, and Technology

Wireless Roadside Inspection Program: Phase II Moves Forward

The Wireless Roadside Inspection (WRI) Program continues to move forward with Phase II Pilot Testing. Kickoff meetings for the Universal Identification (UID) Platform and the Dedicated Short-Range Communications (DSRC) Platform were held in October and November 2008. A Commercial Mobile Radio Services (CMRS) Platform kickoff meeting will be held in the spring of 2009.

The goal of the WRI Program Phase II Pilot Test is to test various technology methods to wirelessly inspect a commercial motor vehicle (CMV) and thereby assess the safety status of the driver, the vehicle, and the carrier. Additionally, Phase II will further refine the WRI Concept of Operations and the WRI Systems Architecture, and provide data and analysis to support a "go/no-go" decision for a WRI field operational test.

Two key WRI Phase II activities will begin in early 2009. First, the National Transportation Research Center Incorporated (NTRCI), in partnership with Battelle Corporation, will define the WRI Systems Functional and Performance Requirements. Starting in February 2009, NTRCI will conduct stakeholder focus groups to determine potential uses and interactions with the WRI system when it is nationally deployed. Stakeholder groups include state enforcement, motor carriers (including motor coach operators), vehicle manufacturers; technology/service providers, State and Federal CMV data systems providers, FMCSA policy and enforcement decision-makers, and other Federal agencies. It is expected that the sessions will be completed in April 2009.

Second, the Oak Ridge National Laboratory will engage potential partners for the Phase II Pilot testing of CMRS technologies for WRI. Partners may include commercial carriers, CMV and technology manufacturers, and/or telematics service providers. The goal is to explore gratis partnerships to demonstrate the wireless inspection of CMV using CMRS technology and discuss trigger methods for the inspection data.

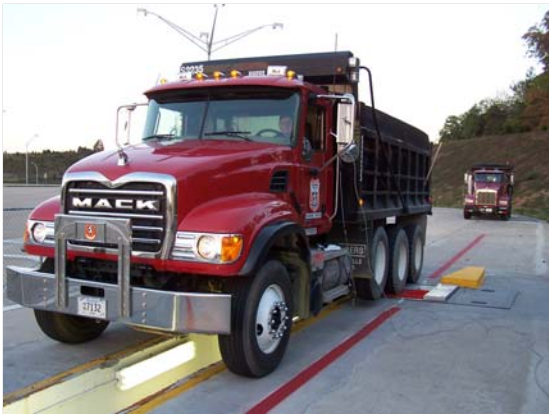
Note: For information on WRI Phase I, please see Issue #1 of Technology Corridor News, *which is online at: http://www.fmcsa.dot.gov/documents/Fall-2008-Technology-Corr-News-Sept-08.pdf*

Brake Wear and Performance Testing Project Completes First 12 Months of Field Operational Testing

The Brake Wear and Performance Testing (BWPT) project being conducted at the Greene County, TN, commercial motor vehicle (CMV) inspection station (southbound I-81 mile marker 21) recently completed the first 12 months of the 14-month field operational test (FOT). The FOT is scheduled to finish in February 2009.

Eight CMVs from four different vocations are being testing in the BWPT. The vehicles are receiving monthly Performance-Based Brake Tests (PBBT) and will undergo drum, rotor, and lining measurements at the end of the FOT. An analysis of performance vs. wear, performance vs. mileage and wear vs. mileage will be conducted for each of the eight vehicles.

Additionally, for certain vehicles with drum brakes, ovality measurements will be taken to analyze the growth in ovality over time and mileage. The analyses and final report are expected in the summer of 2009.



BWPT Vehicle Undergoing a PBBT Test

Coming Next Quarter:

UPDATES—

- **Wireless Roadside Inspection Pilot Test**
- **Brake Wear and Performance Test**
- **Smart Infrared Inspection System**
- **Technology in Motion Vehicle**
- **In-service Braking Test**

"The goal of the WRI Program Phase II Pilot Testing is to test various technology methods to wirelessly inspect a commercial motor vehicle and thereby identify the driver, the vehicle, and the carrier." (page 1)

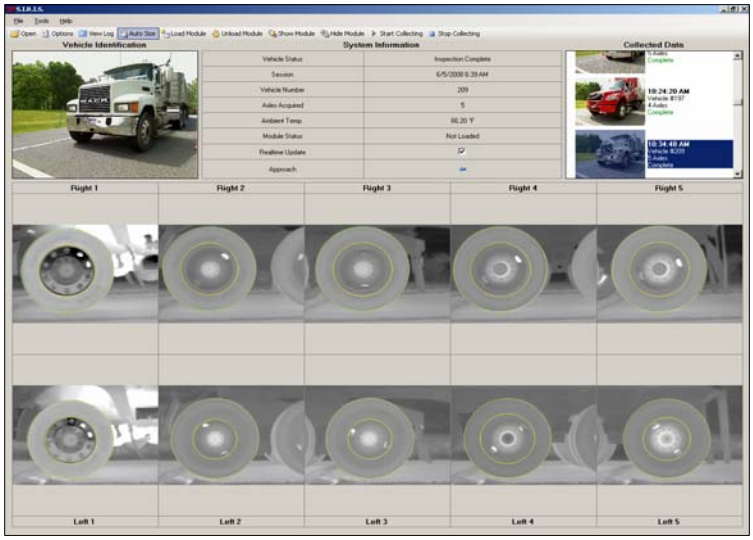
"Initial analysis resulted in a rule that, when applied to actual Level-1 data, SIRIS accurately predicted nearly 65% of the vehicles with brake problems with a very low false positive rate." (page 2)

"The Oak Ridge National Laboratory conducted a brake inspection correlation study on 647 CMVs tested on a Performance-Based Brake Tester (PBBT) and undergoing a subsequent North American Standard (NAS) Level-1 vehicle inspection," (page 3)

SIRIS to Undergo Further Testing at the Roadside Tech Corridor

In 2006, International Electronic Machines Corporation (IEM), with support from FMCSA and the New York State Energy Research and Development Authority, began to develop a Smart Infrared Inspection System (SIRIS) that addresses many of the noted problems with the current thermal prescreening programs.

During the summer of 2007, a first generation prototype version of the system was deployed at the Commercial Motor Vehicle Roadside Technology Corridor (CMV RTC). Out of that effort, IEM was able to derive some key preliminary observations regarding thermal properties of commercial vehicles and to make significant adjustments to the system configuration. During the remainder of 2007 and 2008, IEM made several modifications to the overall SIRIS configuration and based on this, a second generation of the SIRIS prototype was deployed for data collection and verification purposes at an inspection sites in New York and New Jersey.



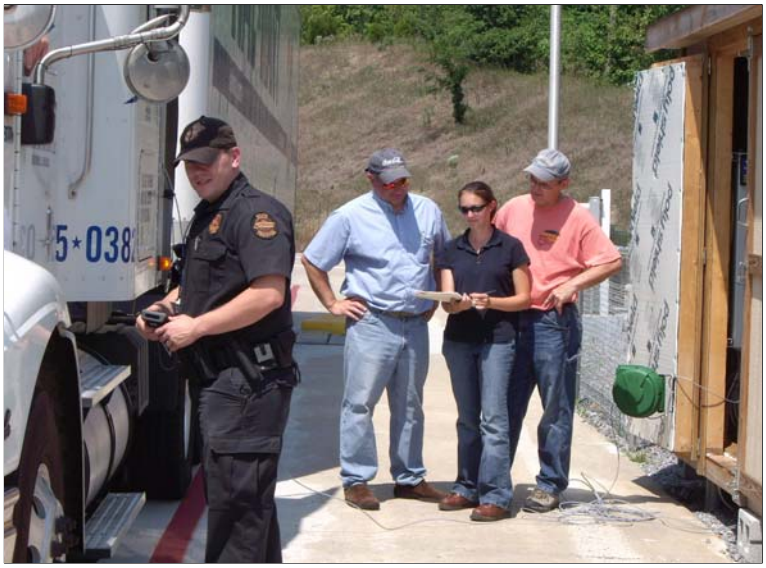
The SIRIS Graphical User Interface

This data is currently being analyzed by the University of Michigan Transportation Research Institute with the goal of generating a set of statistically-based rules for automatic vehicle evaluation.

Initial analysis resulted in a rule that, when applied to actual Level-1 data, SIRIS accurately predicted nearly 65 percent of the vehicles with brake problems with a very low false positive rate. Additional analysis will further refine the rule-based system. SIRIS will return to the Roadside Technology Corridor in 2009, this time with a prototype of the intelligent evaluation software operating.

In-Service Braking Research

From the 1940s to the 1980s, stopping tests were required to aid the design of safe stopping distances into new roadways and assess the relative braking capability of various types of in-service vehicles and track their change over time. Today, after more than 25 years without such data, stopping capability tests and brake assessments of commercial motor vehicles (CMVs) are being conducted at the CMV Roadside Technology Corridor. Information is being gathered to assess the condition of CMV brakes and thus give a representative snapshot of the braking capabilities of CMVs on the road today.



Engineering student Amy Long reviews data with industry representatives as a Tennessee Highway Patrol officer conducts a Performance-Based Brake Test.

Vehicles from cooperative fleets passing through the Greene County, TN, inspection station (located at southbound I-81 mile marker 21) participated in 20-mph stopping tests. During the tests, drivers were asked to carry out a “best-effort” stop in trucks with a variety of loads.

Four specific tests were conducted on each cooperative vehicle:

- Stopping tests, utilizing the GPS-based RaceLogic Vbox data acquisition system
- Performance-Based Brake Test
- North American Standard Level-1 Inspection
- Free stroke and push rod length measurements

The information gathered from this testing can help identify safety concerns in CMVs, be used to implement vehicle safety improvements, and benefit highway safety.

COMMERCIAL MOTOR VEHICLE ROADSIDE TECHNOLOGY CORRIDOR

U.S. Department of Transportation
Federal Motor Carriers Safety Administration
Office of Analysis, Research, and Technology

For more information contact:
Jeff Loftus
Phone: 202-385-2363
Fax: 202·385·2422
E-moil: jeff.loftus@dot.gov

PBBT/NAS Level-I Correlation Study

The Oak Ridge National Laboratory conducted inspection correlation study on 647 CMVs tested on a Performance-Based Brake Tester (PBBT) and undergoing a subsequent North American Standard (NAS) Level-I vehicle inspection, which were conducted November 2007 through November 2008 at the CMV Roadside Technology Corridor.

The purpose of this study was to compare the brake-related out-of-service rates between the NAS Level-I inspections and the PBBT measurement. The NAS Level-I inspection requires an inspector to measure the difference in stroke length of each airbrake from the at-rest condition 10 the full brake application condition. The PBST machine measures the actual brake force that can be produced by each individual wheel end during a full brake application.

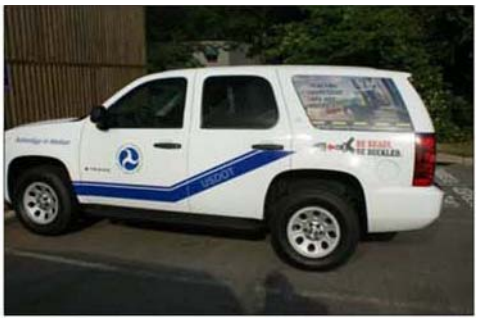
This study has detennined that 69 percent of the time the results match between the Level I brake inspection and the PSBT test. Twenty-one percent of the time the vehicle "passed" the PBBT test, but "failed" the Level·1 brake inspection, meaning that the vehicle developed sufficient brake force 10 stop the vehicle, but the measured brake stroke length exceeded the maximum allowable measured. Most conceming, however, is that the study showed thai 10 percent of the vehicles "passed" the Level-I inspection and failed the PBBT test, meaning that the physical inspection showed that the measured stroke length of each airbrake system mel the requirements, but the vehicle fai led to develop sufficient brake force to effectively stop the vehicle.

A commercial tanker truck undergoes a Performance-Based Brake Test

This correlation study is planned to continue, as resources allow, to gather data to confinn the differences between a physical inspection oflhe brake system and measuring brake system performance using a PBBT.

FMCSA to Field the Technology in Motion Vehicle

The Federal Motor Carrier Safety Administration's Southern Service Center (SSC) has purchased a 2008 Chevrolet Tahoe that will be used to promote heavy vehicle enforccment and safcty technologies and systems with the goal of increasing end-user acceptance, adoption, and usc.



The Technology in Motion Vehicle

This vehicle has been named the Technology in Motion Vchicle (TMV) and is planned to visit venues of local, state, and national interest, as well as serve as a tool for education, outreach, and research. The TMV will be equipped with technology as a part of the CMV Roadside Technology Corridor and is scheduled to be fully operational in about nine months. In the interim, the TMV has been attending venues as a safety outreach vehicle.

Enforcement technologies within the TMV will include license plate readers, US DOT number readers, and FMCSA software systems (e.g., ASPEN, ISS, PRISM).

CMV safety systems within the TMV witl include electronic on-board recorders, lane departure, communications, collision avoidance technologies.

The TMV will also be equipped with a l1at panel monitor for presentations.

Ultimately, by allowing highway safety personnel "hands on" access to this technology, the ease of its use can be demonstrated and more readily implemented by the law enforcement community to increase efficiency and productivity.