



Commercial Motor Vehicle Roadside Technology Corridor



2010 Safety Technology Showcase

October 14, 2010 | Greeneville, Tennessee

Background

The Federal Motor Carrier Safety Administration (FMCSA) launched the Commercial Motor Vehicle Roadside Technology Corridor (CMVRTC) on August 7, 2007, in partnership with the Tennessee Departments of Safety and Transportation, the Oak Ridge National Laboratory (ORNL), and the University of Tennessee, to further enable the FMCSA testing of current, new to market and emerging commercial motor vehicle (CMV) safety technologies and to promote their usage and acceptance by stakeholders.

The CMVRTC is a series of specially equipped testing facilities at inspection stations in Tennessee to demonstrate, test, evaluate, and showcase innovative CMV safety technologies under real-world conditions in order to improve commercial truck and bus safety. It is located in Tennessee on a 70-mile stretch of I-81 and I-40 in Knox, Greene, Hamblen, Jefferson, and Sevier counties. Currently, there are plans to expand the Corridor to I-65 near Nashville. It is anchored on the west end by the Knox County CMV Inspection Station (IS) and on the east end by the Greene County CMV IS.

The CMVRTC is managed through the FMCSA's Office of Analysis, Research, and Technology (ART) via an interagency agreement with the Department of Energy's (DOE) Oak Ridge National Laboratory (ORNL). Since 2007, ART has established internal partnerships with the FMCSA Offices of Bus and Truck Standards and Operations, Enforcement and Compliance, and Safety Programs in Headquarters and with the Southern Service Center in the Field. The CMVRTC is available to these and other FMCSA offices with management support provided by ORNL. The ART has established an external partnership with DOE's Office of Energy, Efficiency, and Renewable Energy to collect CMV safety sensor data from a DOE partner fleet. This data will be used to support the objectives of the CMVRTC.

Since its commissioning in 2007, testing has been conducted in the CMVRTC to:

- Study the wear and performance of brake drums/rotors and lining/pads of four different vocations of Class-8 CMVs;
- Correlate Performance-Based Brake Tester (PBBT) results with North American Standard (NAS) Level-1 inspection results relative to CMV brakes;
- Support the supplanting of the PBBT test in lieu of physical brake stroke measurements in the NAS Level-1 inspection;
- Determine the out-of-service (OOS) rate of the mainline on I-81 southbound (Greene County CMV IS);

- Determine and contrast the OOS rates for the other fixed inspection sites with that of Greene County site;
- Support the development of functional specifications for a Smart Infrared Inspection System (SIRIS) for brakes, tires, and bearings;
- Prove the viability of the Wireless Roadside Inspection (WRI) Concept; and
- Test system loading, end-to-end functioning, and end-user acceptance of WRI using commercial mobile radio services (CMRS).

A quarterly newsletter describing the research within the CMVRTC is published via ORNL/FMCSA and posted to the ART webpage at: <http://www.fmcsa.dot.gov/facts-research/art-CMV-Roadside-Technology-Corridor.htm>

Benefits of the CMVRTC

1. Showcase inspection technologies and highlight their systematic integration with existing enforcement operations and highway information systems by our State partners at the Tennessee Department of Safety and Tennessee Department of Transportation;
2. Collect data on CMV safety technologies of interest to FMCSA and assess their viability for deployment;
3. Provide a technology transfer function for new to market and emerging technologies by collection operational data for the development of functional specifications to support MCSAP grant applications; and
4. Collect data to support FMCSA enforcement and compliance programs, State safety programs, policy research, and future rulemaking activities.

Vision for the CMVRTC

The Vision for the CMVRTC going forward is to expand the Corridor to additional inspection sites in Tennessee and other states as program level efforts, such as WRI and Smart Roadside, mature and require a larger test bed and multi-site, multi-state participation. Additionally, the CMVRTC plays a prominent role in supporting the Agency's technology transfer activities enabling the accelerated deployment of proven safety technologies.

What You Will See in Today's Showcase

Wireless Roadside Inspection (WRI)

Background and overview of the WRI program will be presented in a designated tent (**Location # 3a**). The live Commercial Mobile Radio Service (CMRS) demonstration will be presented from the main control room.

- **CMRS (Location # 3b)**
Participants will observe fleet vehicles that are currently participating in the CMRS Pilot Test as they are inspected wirelessly while traversing I-81 southbound. The results of these inspections will be displayed on the enforcement computers in the control room. The inspected vehicles will pass a Safety Data Message (SDM) when the vehicle being tested encounters a geo fence

established at the inspection station. The SDM will be sent to the government Back Office System (BOS) where the SDM data will trigger additional queries of existing data on the driver, carrier, and vehicle. The data from these queries will be formatted into a Wireless Roadside Inspection report that will be sent to the inspection station for viewing by enforcement personnel and participants as the vehicle continues on the mainline. Vehicles participating in the CMRS Pilot Test will also be available for viewing by participants in the parking area. The data retrieved from the vehicles will include:

- real-time identification of driver,
 - real-time identification of the carrier,
 - real-time identification of the vehicle,
 - real-time information about the condition of the vehicle, and
 - real-time (and historic) hours-of-service (driver logbook).
- **UID (Location # 3c)**
The Universal Identification (UID) platform will be presented using a commercial vehicle passing through a license plate reader. This platform will employ the use of transponders from current electronic clearance programs (e.g., PrePass, NORPASS) and license-plate reading cameras in the WRI test. A key hypothesis that the UID platform will investigate is whether or not a carrier can participate in the WRI concept with no onboard technology and only an Internet connection.
- **DSRC (Location # 3d)**
The Dedicated Short-Range Communications (DSRC) platform will be presented using prerecorded video or presentation provided by the New York-based WRI DSRC Pilot Test platform. Additional platform-provided equipment may also be displayed in a static mode (e.g., a transponder). A unique aspect of this platform is that the State of New York is testing the WRI application as part of their ongoing Commercial Vehicle Infrastructure Integration (CVII) program, i.e., IntelliDrive for Trucks. The FMCSA and New York State have directly aligned the CVII program with the Department's IntelliDrive(SM) activities as an integral part of the Vehicle-to-Infrastructure element.
- **Trusted Truck (Location # 5)**
Participants will see a vehicle configured with Trusted Truck electronics and view a prerecorded video or PowerPoint presentation on the concept and results from the testing. They will also see a poster showing an overview of the effort. Researchers will be on-hand to present the material and answer questions. The Trusted Truck program is investigating a similar WRI concept, but with a different operational model.

Smart Infrared Inspection System (SIRIS) – Participants will see a demonstration vehicle being screened by the SIRIS system and will be able to view real-time inspection results on the large-screen monitor at the SIRIS exhibit. Printouts of the SIRIS screenings will also be provided. Participants will be able to go near the ramp and view the components of the SIRIS system first-hand. **(Location # 4)**

Performance-Based Brake Tester (PBBT) Correlation Study/Level-1

Augmentation – Participants will observe how a PBBT inspection is performed and how a PBBT brake inspection can be supplanted into the Level-1 inspection in lieu of the physical measurement of brake stroke. Participants will also be able to view a PowerPoint presentation and poster session on brake-related OOS violations and rates relative to the I-81 stream and the correlation between the findings of the PBBT inspections and the Level-1 inspections. **(Location # 7a and # 7b)**

Medium Truck Duty Cycle (Safety Sensor Technology) – Participants will see a Class-7 tractor-trailer outfitted with brake stroke monitoring, weight monitoring, and tire pressure monitoring systems. Company safety, maintenance, and driver personnel will be on-hand to give feedback on their perceived benefits of these technologies. Additionally, analysis of a year-long study of these technologies will be presented via a poster focusing on the analysis of these safety sensors. **(Location # 8)**

Technology In Motion Vehicle (TMV) – The FMCSA Southern Service Center has created a demonstration vehicle in partnership with the Technology Division. The TMV can be considered a mobile extension of the CMVRTC. It is currently in use throughout the FMCSA Southern Service Center-area states. Its purpose is to raise stakeholder awareness and increase adoption of safety technologies. Participants will be able to view the technologies on-board the TMV and speak with FMCSA staff responsible for its operation. This portion of the showcase will focus on the TMV and its mission rather than any particular technology, although the demo units will still be set up. **(Location # 9)**

FMCSA Programs – Various FMCSA programs (CVISN, CS2010, COMPASS, etc.) will be presented by FMCSA staff using PowerPoint and posters. **(Location # 10)**

Tennessee Department of Safety

- **“No Zone” Tractor-Trailer (Location # 12)** – A static display of the “No Zone” Tractor Trailer that promotes sharing the road safely with commercial motor vehicles.
- **TDOS Hazardous Situation Robot (Location # 11)** – Participants will see a live demonstration of the robot and hear an overview of its benefits to the Tennessee Department of Safety.