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*This monthly report from the University Transportation Centers Program highlights some of the recent accomplishments and products from one of the University Transportation Centers (UTCs). The UTC Program is administered by the U.S. Department of Transportation's Research and Innovative Technology Administration.*

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## UTC Explores "Trusted Truck" Concept to Use Wireless Technology to Ease Roadside Inspections

Advances in weigh-in-motion systems and their expanding use allow increasing numbers of trucks to cruise past weigh stations, and their long lines, without even slowing down. But a shortcoming of these systems is that other truck data, including safety information, must still be collected at static stations. Soon, however, a Trusted Truck<sup>®</sup> program, which pairs new wireless communications technology with existing truck electronics, will add roadside safety inspections to the "in-motion" bypass list. Not only will trucks with well-maintained equipment save valuable driving time and fuel, but it is expected that this technology will allow inspectors to make the most of limited resources as they face ever increasing heavy-truck traffic.



NTRCI

**Trusted Truck<sup>®</sup> Demonstration Truck**

The objective of the Trusted Truck<sup>®</sup> project is to increase safety, security, and efficiency of truck transportation by presenting wireless credentials to roadside inspectors—credentials that confirm the driver, tractor, trailer, and cargo meet all appropriate Federal Motor Carrier Safety Administration (FMCSA) requirements for safe cargo transportation. By presenting these credentials without the need to stop, the

number of inspections increase, the efficiency of the system improves, and inspectors have more time to target more likely safety and security violations.

The concept of the Trusted Truck<sup>®</sup> inspection certification system came out of three separate but related items:

1. FMCSA is concerned that, as heavy vehicle traffic volume increases and the number of inspectors remains static, new tools and innovative technologies and approaches are needed to ensure commercial motor vehicle safety on the nation's highways.
2. Concerns by those heavy-vehicle carriers who do ensure that their trucks meet safety requirements, that they are wasting time and fuel at congested inspection stations as a result of carriers who do not take similar appropriate care and concern for vehicle safety.
3. Lastly was the realization by the National Transportation Research Center, Inc. (NTRCI) project team that technology had advanced to the point where a wireless inspection program was feasible.

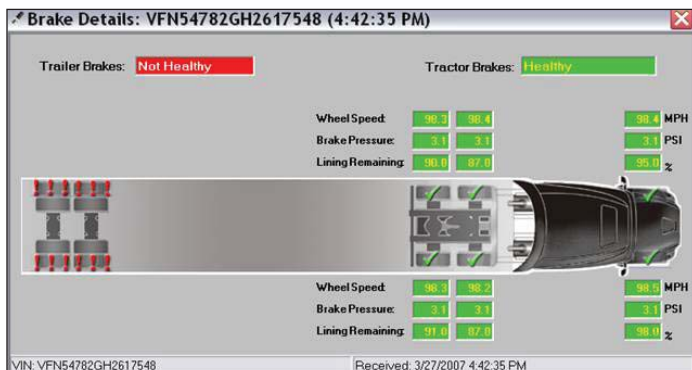
The concept of remotely and automatically inspecting a truck was first put to the test by the NTRCI, and The University of Tennessee while working with Volvo Trucks North America and Volvo Technology America. The project began as a simple proof of con-



cept with a successful demonstration on December 1, 2004, at the Watt Road Inspection station on I-40/75 on the west side of Knoxville, Tennessee.

The project transmitted real-time truck brake condition data to the roadside inspection officer. Following proof of concept, additional functionality was added, including initial implementation of the Trusted Truck® Management Center (TTMC), upgrading roadside communications, and increasing the number of safety-related items included in the wireless roadside inspection to include tractor and trailer weight, trailer tire pressure and temperature, trailer ID, and shipment data. Features also include implementation of driver logon authentication through the TTMC.

A second demonstration included a “trusted” vehicle bypassing a roadside inspection using the TTMC as the method of delivering the inspection results. This demonstration showed that if the vehicle passed the wireless inspection, the driver was instructed via the bypass notification dashboard display to proceed past the inspection station without stopping, saving both time and fuel.



### Detailed Brake Status Display

If the vehicle failed the wireless inspection, the truck driver was informed to enter the inspection station in the same manner as all other vehicles without Trusted Truck® status. The Trusted Truck® effort also includes data security, necessary to assure that all aspects of the data are secure from tampering. Current project efforts include integrating a data security scheme into the project.

The benefit for fleets will come from improved productivity and driver satisfaction. It should also help level the playing

field for those that bear the costs of good maintenance programs by allowing inspectors to focus on trucks most likely to have safety violations.



### Trusted Truck® allows remote inspection at highway speeds and increases productivity and safety.

wireless communication technology in the summer of 2007, FMCSA decided to move forward with the second of the three phases, which includes a look at alternative communication technologies in separate pilot tests, the update of FMCSA back office systems to provide both a better data warehousing effort and a real time interface with other federal and state enforcement systems. In addition, the second phase includes a thorough look at both national system requirements and a mechanism to evaluate the pilot tests against these requirements.

Recognizing the similar goals of the FMCSA wireless roadside inspection project and the NTRCI Trusted Truck® inspection certification program, FMCSA and NTRCI committed to a cooperative program in 2008. The role of NTRCI is to develop the comprehensive requirements based on a series of stakeholder meetings and then develop an evaluation plan against these requirements as well as conduct the evaluation resulting in a final report.

The NTRCI Trusted Truck® project continues as a separate but related project to the FMCSA wireless roadside inspection project. Upon completion of the current Trusted Truck® work in 2010, and a continued effort to create a TTMC interface with the new FMCSA back office in 2010, a full scale field demonstration of the Trusted Truck® is anticipated as part of the FMCSA's wireless roadside inspection demonstration program. ♻️

In 2006 FMCSA initiated a three-phase program to evaluate the validity of a national wireless roadside inspection program. Subsequent to their Proof of Concept demonstration of

### About This Project

Joseph Petrolino is the director of the National Transportation Research Center, Inc, University Transportation Center. This project team is lead by Thomas Urbanik II, Ph.D., PE, Professor and Goodrich Chair of Excellence in Transportation at the University of Tennessee. He is assisted by Assistant Professor Itamar Arel from the University of Tennessee along with Industry Research Partnerships with Volvo Technology of America and Volvo Trucks North America. For more information on this project and other NTRCI-UTC projects visit: [www.ntrci.org](http://www.ntrci.org).

