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VEHICLE TO VEHICLE COMMUNICATIONS FOR TRUCKS



The trucking industry is a critical component of American commerce. The American Trucking Association estimates that over 80 percent of U.S. communities depend exclusively on trucking for delivery of their goods and commodities.

With more than 9 million registered large trucks on our nation’s highways, cars and trucks must share the roads safely. Industry stakeholders, including car and truck manufacturers, federal agencies (such as the National Highway Traffic Safety Administration and Federal Motor Carrier Safety Administration), and state departments of transportation, have worked hard to ensure compatibility between cars and trucks. Nevertheless, in 2009, approximately 10 percent of all fatal crashes involved a large truck—with most of those fatalities also involving a collision between a large truck and a passenger car.

Connected vehicle technology has the potential to improve the safety of our roads by transforming the way Americans travel. Through the creation of a safe, interoperable wireless communications network, cars, trucks, buses, and other vehicles will be able to “talk” to each other with in-vehicle or aftermarket devices that continuously share important safety, mobility, and environmental information. Connected vehicles could also use wireless communication to “talk” to traffic signals, work zones, toll booths, school zones, and other types of infrastructure. These connected vehicles could alert drivers when a potential hazard arises, such as when another car is too close or in the driver’s blind spot—giving the driver time to react and avoid a potential accident.

Connected vehicles have the potential to make trucking safer, smarter, and greener.

Connected Vehicle Truck Safety

Wireless communications technology will enable significant improvements in truck safety. Research from the National Highway Traffic Safety Administration (NHTSA) shows that connected vehicle technology has the potential to address a substantial number of light vehicle crashes and heavy truck crashes by unimpaired drivers. Since safety is the U.S. Department of Transportation’s (USDOT’s) top priority, the potential safety benefits of this technology cannot be ignored. However, more research is necessary to determine the actual effectiveness of the applications and to understand the best ways to communicate safety messages to motorists without causing unnecessary distraction.

Thus, the USDOT initiated the Integrated Truck Safety Program and the Commercial Vehicle Retrofit Safety Device Program to incorporate wireless dedicated short range communications (DSRC) technology into a commercial vehicle platform and to refine



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crash avoidance safety applications on commercial vehicles. These applications will be interoperable (e.g., capable of sharing messages) with other vehicle platforms, specifically light vehicles, so that trucks and light vehicles will be more aware of each other as they share our highways.

The Truck Safety Program will develop several trucking applications that use vehicle-to-vehicle (V2V) communications including:

- **Forward Collision Warning:** Warns drivers if a vehicle ahead is stopped or traveling slower and there is a potential risk of collision
- **Blind Spot Warning/Lane Change Warning:** Warns drivers when changing lanes if there is a car in their blind spot
- **Intersection Movement Assist:** Warns drivers when it is not safe to enter an intersection due to high-collision probability with other vehicles
- **Electronic Emergency Brake Light:** Notifies the driver if there is a sudden-braking vehicle ahead (or several vehicles ahead).

The program will also develop a limited number of vehicle-to-infrastructure safety applications such as curve-speed warning and other in-vehicle signage applications such as speed limit, construction zone, or low-clearance bridge height notifications.

Connected Vehicle Safety Pilot and Trucks

The Connected Vehicle Safety Pilot was a key test for how connected vehicle technology can enhance road safety as heavy trucks and light vehicles continue to share the roads. The Safety Pilot included two critical test efforts—driver clinics and a model deployment:

- **Safety Pilot Driver Clinics:** Small-scale driver clinics were conducted at various sites in the United States to assess user acceptance of connected vehicle technology. Two of the driver clinics specifically focused on trucks. These clinics

had a truck integrated with wireless crash warning devices as well as participating light vehicles equipped with a vehicle awareness device. The equipment onboard the truck included a DSRC radio, safety applications, an operating system, and a driver-vehicle interface. The truck also was instrumented with an on-board data acquisition system.

Each clinic included a cross-section of commercial vehicle drivers, recruited from local trucking fleets, testing the connected vehicle technology. The drivers operated the vehicles in a safe, highly controlled, closed-course environment.

- **Safety Pilot Model Deployment:** Using approximately 2,800 cars, trucks, and transit vehicles (and some infrastructure) equipped with wireless connected vehicle devices, this model deployment has created a highly concentrated environment of equipped vehicles operating on public streets to test safety applications using DSRC. The model deployment was designed to determine the effectiveness of the technology at reducing crashes. Vehicles were able to tell when another vehicle with connected vehicle technology moved into the immediate driving area. Conducted from 2012 to 2013, the one-year model deployment, held in Ann Arbor, MI, was the first test of this magnitude of connected vehicle technology in a real-world, multimodal operating environment.

Research Results

Based on the robust amount of data collected during our safety pilot, NHTSA has made an agency decision to begin taking steps to enable V2V communication technology for light vehicles. This means that V2V devices, which enable vehicles to communicate with other nearby vehicles, will be required in new light vehicles in a future year. NHTSA will make an agency decision on the future of connected vehicle technology for trucks in 2014. The decision could include several options, such as mandatory deployment of the technology in all new heavy vehicles, voluntary installation of wireless devices in new heavy vehicles, or additional research and development.

For more information about this initiative, please contact:

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