

## 0-6836: Commercial Truck Platooning—Level 2 Automation

### Background

Besides driver compensation, the largest operating expense for a line-haul truck is the cost of fuel. At 65 mph, each truck expends about 65 percent of its fuel consumption to overcome the effects of aerodynamic drag. Many of the large and small fleet operators are currently using a variety of different techniques and technologies to achieve a 1 or 2 percent fuel efficiency gain. However, research suggests that platooning technology can provide a 5 to 20 percent fuel savings, depending on the gap, speed, number of vehicles, and location of a vehicle within a platoon. Platooning also offers other benefits, such as emission reduction, additional vehicle safety features, and increased highway throughput, just to name a few.

Level 2 truck platooning is an extension of cooperative adaptive cruise control that uses automated lateral and longitudinal vehicle control, while maintaining a tight formation of vehicles with short following distances. A platoon is led by a manually driven truck and allows the drivers of the following truck(s) to disengage from their driving tasks and monitor the system performance. Driving in a platoon formation has demonstrated the potential for significant fuel savings benefits and associated reductions in emissions from the vehicles within the platoon.

Through this project, the Texas Department of Transportation (TxDOT) funded the creation of a comprehensive truck platooning demonstration in Texas. The focus was on the feasibility of deploying two-vehicle truck platoons on specific corridors in Texas within 5 to 10 years. The

project brought together major partners, including government agencies, national labs, truck manufacturers, and equipment suppliers, all of which have committed resources in terms of in-kind matching of equipment, engineering services, and intellectual property.

### What the Researchers Did

The Texas A&M Transportation Institute (TTI) team investigated and documented lessons learned from past platooning projects, identified potential regulatory or legislative roadblocks that could hamper or facilitate introduction of platooning into commercial fleet operations, and explored the possible benefits and implementation scenarios within the existing infrastructure and operational environment. The TTI team also developed, tested, and demonstrated the platooning technology (proof of concept), which culminated in a full-scale demonstration workshop in July 2016 in College Station, Texas, (Figure 1) to disseminate the results; capture insights, comments, and buy-in from stakeholders; and set the stage for further

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#### Project Completed:

8-31-2016

development and deployment on Texas roadways.

### What They Found

As part of the proof-of-concept event, the TTI team successfully demonstrated that two trucks could perform as a platoon at low speeds and perform a series of maneuvers and maintain a predetermined following distance. These maneuvers included joining a platoon from a stop and driving in a figure-eight path; making a left-lane change, a right-lane change, and a gap increase; and stopping in formation. The demonstration was successful and proved the concept that commercial trucks can platoon in level 2 automation.

### What This Means

The creation of a comprehensive truck platooning demonstration in Texas serves as a proactive effort in assessing innovative operational strategies to position TxDOT as a leader in this research area, and in the overall transportation systems management and operation and connected vehicle and automated vehicle initiatives. Future phases may work to develop the concept of operations and requirements for design of platooning systems and corridors in Texas, and look toward full-scale deployment of a commercial truck platooning application in Texas on a major freight corridor across the state.



Figure 1. Platooning Demonstration in College Station, Texas, in July 2016.

#### For More Information

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Keyword: Research