Evaluation Of Autonomous TMA Trucks For Use In Caltrans’ Operations

Test an Autonomous Truck Mounted Attenuator’s (ATMA) ability to provide the same protection as a conventional Truck Mounted Attenuator (TMA) truck.

WHAT IS THE NEED?

California Department of Transportation (Caltrans) highway maintenance and repair activities often require a shadow (trailing) truck equipped with a TMA to provide impact protection for workers from errant vehicles. The nature of shadow trucks, or TMA trucks, dictates that they will be hit by errant vehicles, so while the TMA truck increases safety for the workers, each collision still compromises the safety and well-being of the shadow truck driver.

There is a need to completely remove Caltrans’ shadow truck drivers from the risks associated with errant vehicle impacts. With the advent of autonomous vehicles, it may be possible to eliminate driver exposure by utilizing ATMA trucks. Research is needed to determine if existing ATMA technology can fill this need, and if not, document what is needed to reach the goal.

WHAT ARE WE DOING?

Caltrans is working with the Advanced Highway Maintenance Construction Technology Research Center (AHMCT) at University of California, Davis to conduct this research.

A research project panel will be developed as the first part of this research task to help guide this effort. AHMCT will then procure an ATMA truck, based on specifications that have been developed by Caltrans Division of Equipment. During the procurement process, AHMCT will perform a product search for equipment that can provide ATMA capability, as well as review current regulations on autonomous vehicle usage as they relate to the ATMA truck.
An ATMA system test plan will be developed based on guidance from the research task panel. The system test plan will focus on the ATMA’s ability to provide the same protection as that of a standard TMA truck. The ATMA evaluation will attempt to answer the following research questions:

- Where and in what situations can the ATMA truck safely maneuver without a driver?
- In what operations can the ATMA truck be safely used?
- What operations could the ATMA truck be used in if reasonable modifications were made?
- Are there any “fatal flaws” in the technology?
- Are there special maintenance issues or considerations?
- What is the worker feedback on likes/dislikes, maintenance issues, operational issues, and requests for improvements?
- Do workers accept the machine and want to use it?
- What training or certifications are required for operation?

The main deliverables for this research include an ATMA system, the final report that documents the product search for equipment, current autonomous vehicle regulations, and the evaluation of the ATMA truck.

**WHAT IS OUR GOAL?**

The goal of this study is to evaluate the ATMA truck’s ability to provide the same protection to Caltrans workers as that of a standard TMA truck.

**WHAT IS THE BENEFIT?**

Caltrans will benefit from this research by being a national leader in the use of autonomous and connected vehicle technology that can potentially reduce or eliminate threats to employees while maintaining public safety.

**WHAT IS THE PROGRESS TO DATE?**

The ATMA and leader vehicle were delivered to Caltrans in November of 2019. Caltrans Division of Equipment inspected the system and ultimately approved the delivery in January 2020. Operator training was completed in November of 2019. There was a demonstration of the ATMA for California Highway Patrol, Department of Motor Vehicles, and California State Transportation Agency to determine what the next steps for testing the system. Because of delays due to the late delivery of the ATMA and the Covid-19 shelter in place requirements, this research has been extended to March 31st, 2021.

For additional information, please contact the Task Manager.

**IMAGE**

Figure 1: Image of ATMA in operation.

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