DRISI
CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION

Research Notes

Maintenance

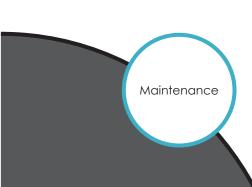## Field trials of the Truck-Mounted Attenuator Accessory (TMAA)

Field evaluation of accessories and equipment for TMA trucks that can improve safety and the function of TMA truck operations.

MAY 2024

Project Title:
Review of Truck Mounted Attenuator Accessories

Task Number: 4158

Start Date: August 1, 2022

Completion Date: March 31, 2025

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WHAT IS THE NEED?

The California Department of Transportation (Caltrans) often performs highway maintenance operations in work zones with temporary lane closures adjacent to high-speed traffic. The high-speed traffic provides a significant safety hazard to highway maintenance personnel. To shield the work zones from errant vehicle impacts, Caltrans routinely deploys shadow trucks with truck-mounted attenuators (TMAs). The TMAs are designed to decelerate lighter vehicles but impacts of high-speed heavy vehicles can exceed TMA dynamic absorption force limits. The impact risk with physical injury for the shadow truck driver is significant. Since the shadow truck TMAs are mobile and cannot be physically scaled up, the best mitigation strategy for impacts is to influence driver behavior.

WHAT ARE WE DOING?

We are procuring up to three (3) TMAA packages including installation by the system vendor or a local installer. Each technology package will include four cameras (Two will be installed on each side of the TMA and two in the rear), a Mobile Digital Video Recorder (MDVR) with GPS, a changeable message sign (CMS) with radar, a safety zone rear alert, and an ICone. Each camera feed is displayed on a monitor in the TMA cabin and is recorded on the MDVR. The CMS will display the incoming vehicle speed to alert drivers to decrease speed. The safety zone rear alert (panic lights with synchronized flashing pattern) is used to alert distracted drivers. The ICone sends information to Waze App for work zone awareness.

Caltrans

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The researchers will develop a field-testing plan and two surveys for operator feedback. The researchers will provide training to selected shadow truck operators, and the field-testing will commence, with on-site and phone support from the researchers as needed. The field-testing portion of the project will continue for approximately one year, followed by researchers obtaining feedback from the operators, compiling, and reporting of the results.

WHAT IS OUR GOAL?

We are testing up to three TMAA packages for approximately one year in the field during normal Caltrans operations on the highway. Operator feedback will be analyzed. The results of the field testing and operator feedback will inform us if the TMAA package is suited to regular Caltrans operations and this technology package is ready for broad deployment.

WHAT IS THE BENEFIT?

The results of this project will provide significant improvements of safety of shadow truck operators and the traveling public. They will improve Caltrans' ability to safely perform moving closure operations. Furthermore, TMAA package deployment will protect Caltrans' liability by recording accident causes

WHAT IS THE PROGRESS TO DATE?

The research team at UC Davis upgraded the radar board on the El Centro ITMA because the previous board was an initial prototype and could not communicate to a laptop. All TMAA trucks now have the latest software installed. The use of the radar sign board to determine speed of vehicles for research purposes was evaluated. The radar board does report the proper speed to the public, regardless of if the TMA is moving or not. The Video Management Software (VMS) was shown to crew supervisors, and its installation onto supervisor laptops is still in process. Installation is still under review by Caltrans Information Technology. The research team continued to work with the vendor on their privacy policy, which is one of the final pieces to reach IT approval for the mobile DVR software. Review of mDVR data for lane closures, duration, TMA deployment, etc. began in February. The research team access the units every few days to review the data. The researchers trained operators and supervisors in District 4 on1/11/2024. Testing with the District 4 trucks began shortly after operator training.

IMAGES