

Maintenance

FEBRUARY 2023

Project Title:
Caltrans Field Trials of the Intelligent
Truck-Mounted Attenuator (ITMA)

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2024

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Caltrans Field Trials of the Intelligent Truck-Mounted Attenuator (ITMA)

To evaluate the effectiveness of ITMA in actual Caltrans operating conditions and identify any problems which arise during the on-road field trials.

WHAT IS THE NEED?

Caltrans highway maintenance and repair activities often require a shadow (trailing) truck equipped with a Truck Mounted Attenuator (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 remove Caltrans' shadow truck drivers from the risks associated with errant vehicle impacts. This is expected to reduce operator injuries due to public vehicle impacts with the TMA vehicles in highway work zones.

The ITMA, which achieves this, was successfully evaluated on closed test sites in previous research, including testing on a closed segment of State Route 905 (SR905). To proceed towards deployment of the ITMA for regular Caltrans operations, controlled field trials on public roads with and without an ITMA safety operator are essential.

WHAT ARE WE DOING?

This research project plans to perform monitored field trials of the Intelligent Truck-Mounted Attenuator (ITMA) system on California public roads, to demonstrate its feasibility. During normal operations of the ITMA system, the lead vehicle (LV) lays down electronic breadcrumbs (E-crumb) utilizing Global Positioning System (GPS) technology. The steering, engine throttle, and braking of the follower vehicle (FV) are controlled by the Kratos system to follow the E-crumb path of the LV and maintain a user-defined distance.



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The contractor from Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center at UC Davis will work with Kratos on any system modifications that may be necessary, develop a test plan, provide ITMA system training to Caltrans maintenance personnel, conduct system field trials, and collect operator feedback following trials (through survey or interviews), and will perform evaluation of the performance and suitability of the system, including operator acceptance and identification of any concerns.

The initial field trials will be performed on a remote Caltrans-operated public roadway with a safety operator in the ITMA FV. After the review of initial field trials and a consensus to proceed with the test plan, final field trials will be performed with the safety operator moved to the LV, removing operator from the ITMA FV.

WHAT IS OUR GOAL?

The purpose of this research project is to confirm that the Intelligent TMA is safe and effective in actual Caltrans operating conditions and identify any problems which may arise during the on-road field trials.

WHAT IS THE BENEFIT?

This research project provides an opportunity to field test the ITMA in closely monitored rural highway operations. The ITMA will remove the TMA operator from this vehicle and can lead to significant reductions in operator injuries due to public vehicles' impacts with the TMA vehicles.

WHAT IS THE PROGRESS TO DATE?

The scope of work and schedule of this research project was finalized. The kick-off meeting of this project was held on January 6, 2023.

IMAGES

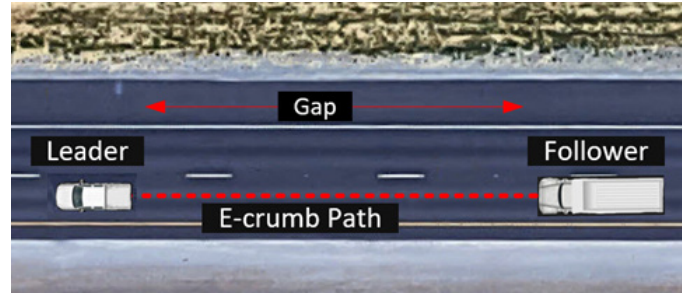


Image 1: E-crumb path guidance

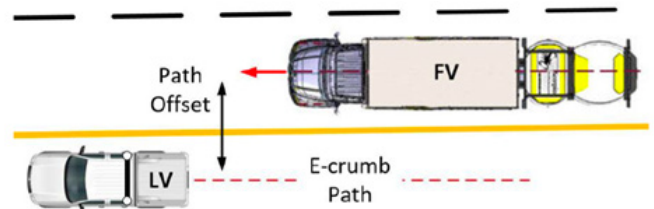


Image 2: E-crumb offset functionality



Image 3: ITMA system