Autonomous Truck Mounted Attenuator (ATMA) Project

Background

Connected and automated vehicle (CAV) technology has the potential to significantly increase work zone safety. Each day, MnDOT maintenance employees and contractors are at risk of being involved in crashes when performing road work. To mitigate this risk, MnDOT uses truck mounted attenuators (TMAs) (or crash cushions) to protect roadside workers, however this also poses safety risks to the brave drivers of these vehicles.

The *Minnesota CAV Challenge* is an innovative contracting method which allows industry to propose CAV solutions to current transportation problems. Kratos Defense and Micro Systems, Inc. proposed an idea to build an autonomous vehicle using technology deployed by the Department of Defense. The goal is to test whether this technology can work in Minnesota to improve safety in work zones and mobile maintenance operations.

How Autonomous Truck Technology Works

Maintenance trucks are retrofitted with connected and automated vehicle technology that allows the second truck to follow the path of lead maintenance vehicles. The lead vehicle leaves “electronic bread crumbs” for the follower vehicle, allowing it to operate autonomously.

For testing and demonstrations, a safety driver will be in the autonomous vehicle at all times. Testing will take place at MnROAD and in limited public roads, with drivers operating both vehicles. In the future, these vehicles may increase worker safety by moving the operator out of harm’s way during active mobile work zone operations.
Project Goals

Worker Safety
- Increase worker safety with automation

Engagement
- Engage with staff and leaders to see how technology can improve worker safety

Improve Technology
- Work with maintenance staff to test and improve technology

Efficiency
- Understand how technology can improve maintenance and operations

Education
- Learn how DOTs can use technology and share best practices with other users

How this Project Works

Retrofit MnDOT vehicles with connected and autonomous technology
- Fall 2019
- Retrofit MnDOT maintenance vehicles with connected and autonomous technology
- Train MnDOT staff on how to use the technology
- Winter 2019-2020
- Decommission trucks for winter operations
- Summer/Fall 2020
- Test and pilot technology at MnROAD and in limited highway maintenance operations
- September 2020
- Validate technology thru testing & pilots
- Train staff
- Project evaluation
- Share lessons with other states

Project Milestones

Supporting National CAV Technology Advancements

Minnesota participates in a 10-state pooled fund effort to advance autonomous maintenance technologies with states including Colorado and Missouri. Minnesota is working to advance technology, engineering, maintenance, and policy to support safe transportation operations throughout the state, region, and country.

For more information contact CAV-X Project Manager Rashmi Brewer, PE at rashmi.brewer@state.mn.us