



AUTONOMOUS IMPACT PROTECTION VEHICLE



PROJECT OVERVIEW

The Colorado Department of Transportation (CDOT) uses trucks with rear-mounted attenuators – also known as crash cushions – in mobile work zones to act as a barrier to absorb or deflect vehicles that would otherwise hit people or equipment. These “impact protection vehicles” protect workers and are usually the first and only crash barrier between workers and the traveling public. Impact protection vehicles are designed to be hit, putting their drivers at a greater risk of being involved in a crash.

CDOT, through its RoadX program, will launch an Autonomous Impact Protection Vehicles pilot project that uses self-driving technology to eliminate the need for a driver in the vehicle, taking them out of harm's way while still effectively protecting roadside workers.

»» THE TECHNOLOGY



The Autonomous Impact Protection Vehicle will follow a manned maintenance vehicle (the leader vehicle). The lead vehicle transmits position, speed and direction to the impact protection vehicle so it can follow in the leader vehicle's exact path. The impact protection vehicle will also carry radar obstacle detection systems to detect anything unusual in its path to avoid collisions.

CDOT/RoadX is looking into equipping the Autonomous Impact Protection Vehicle with a Dedicated Short-Range Communication (DSRC) radio, turning the vehicle into a mobile DSRC Roadside Unit (RSU). This will allow the vehicle to send real-time information about its location, speed and direction, to other “connected vehicles” and the Vehicle-to-Everything (V2X) Data Ecosystem.

»» PARTNERS



Royal Truck & Equipment is building the Autonomous Impact Protection Vehicle, using the latest technology and attaching all accessories, such as the industry's largest variable message board, an eco-friendly truck-mounted generator and arrow boards.



Micro Systems Inc., a subsidiary of Kratos Defense and Security Solutions, has designed the hardware and software needed to provide the driverless capability to the Autonomous Impact Protection Vehicle.



Colas is testing the same technology for use in work zones in the United Kingdom. CDOT and Colas will collaborate to share test methods and lessons learned.



AUTONOMOUS IMPACT PROTECTION VEHICLE

BENEFITS

- Removes the need for drivers, eliminating one of the most dangerous aspects of maintenance work.



REMOVES
DRIVERS

- Helps CDOT reduce injuries and fatalities caused by vehicles entering work zones.



REDUCES
INJURIES

- Lowers operational costs, as smaller maintenance crews will be needed.

LOWERS
COSTS



- Keeps Colorado on the cutting edge, developing new technology to make our roads safer.



KEEPS COLORADO
CUTTING EDGE

ADDITIONAL PROJECT INFO

- The technology is being adapted from military technology already in use.



ADAPTED FROM
MILITARY
TECHNOLOGY

- Autonomous Impact Protection Vehicle testing will first occur on a private track, and once ready, transition to on-road testing.

TRACK
TESTED



- The project will also examine how the technology can be used with other lead vehicles, such as sweepers and mowers.

MAY BE
ADAPTED TO



SWEEPERS
& MOWERS

- CDOT is encouraging peer organizations to get involved with the project. Learn more or get engaged through a peer exchange by contacting Joe Meyer at joseph.f.meyer@state.co.us or 303-512-5502.

PEER
EXCHANGE



STATUS / NEXT STEPS

SPRING 2017

Vehicle is built and CDOT develops a test plan in conjunction with project partners.

SUMMER 2017

Testing and development on private track occurs and lasts for approximately three months. After successful private track testing, the vehicle will transition to on-road testing.

FALL 2017

Project success is determined when the Autonomous Impact Protection Vehicle executes a successful striping operation on a public road without a driver.