

Autonomous crash-protection vehicle does double duty on work zone worker protection

WZDx project highlight: Colorado



Source: Colorado Department of Transportation

The Colorado Department of Transportation (CDOT) understands the dynamic and dangerous nature of work zones and is prioritizing safety in new ways by using Work Zone Data Exchange (WZDx) demonstration grant funding from the Federal Highway Administration (FHWA).

WZDx is a common data specification that streamlines work zone data publication and makes it available for third-party users like infrastructure owners and operators, mapping companies, and eventually automated vehicles.

One aspect of CDOT's WZDx grant-funded pilot program will combine two exciting and emerging technologies. CDOT plans to use Autonomous Truck Mounted Attenuators (ATMAs) to collect live work zone data and publish it through a newly established WZDx data feed. The ultimate goal is to improve the safety of the traveling public and workers in the work zones by sharing the data feeds with the road users. ATMAs work through a leader-follower system, requiring a specially outfitted leader vehicle to





drive ahead, and the ATMA to follow the leader’s maneuvers. CDOT’s testing and implementation of the ATMA focuses on protecting workers in striping operations, by not requiring a driver at risk.

Truck Mounted Attenuators (TMAs) are large vehicles with rear-mounted impact absorbers that park behind or follow vulnerable vehicles or workers in a work zone to protect against oncoming traffic. When a rear impact occurs, the TMA driver can be seriously injured, so removing the vehicle operator and automating the vehicles will ultimately reduce injuries and save lives.

Why WZDx

Until now, integrating work zone data from multiple sources has been a major challenge for the transportation industry—partly because data sources speak different languages and use different platforms. WZDx provides a framework for translating data into one feed in a “universal” language so the information is easily understood, accessible, and economical to use for third parties—including original equipment manufacturers and navigation applications. Ultimately, the better and more accessible data published through WZDx feeds can make work zones safer and prevent crashes, injuries, and fatalities in work zones nationwide.

The ability to produce and share accurate, real-time work zone data is not only important for work zone workers and third parties, but also a major benefit to the traveling public. The data allows mapping services for passenger and freight vehicles to alert drivers of upcoming lane shifts, speed reductions, or greater work zone activity, so they can adjust their plans accordingly. In addition, CDOT believes that increased adoption of the [Work Zone Data Working Group’s](#) WZDx specification by CDOT and other grantees will help prepare for the eventual growth of automated vehicle deployment in the United States.

Marrying two innovative technologies

“CDOT knew the marriage of their work with ATMAs and WZDx would be a perfect match to help drive this initiative,” says Ashley Nysten, CDOT project manager.

Every week, [according to CDOT](#), an average of seven motorists and one highway worker are killed nationwide, specifically in work zones. ATMAs currently protect workers, and with new upgrades, they will soon be able to detect the speed of surrounding vehicles and track other work zone activity, allowing CDOT to better identify mitigation strategies for the future.

Looking to the future

CDOT is finishing the initial planning efforts on the back-end work and will soon stand up its own WZDx data feed.



“One of the challenges facing CDOT and other State departments of transportation (DOTs) is mirroring the planned work zone information with the real-time information,” says Nysten.

Realistically, planned and real-time data should closely reflect each other. Implementing a WZDx feed is allowing CDOT to evaluate how they move data through the department and how they get it out to the public. It also helps determine how real-time, reliable, and accurate the data is as compared to the planned data.

CDOT’s intent for using WZDx is to share all work zone data in one place: inputs from traffic operations on anticipated work and inputs from smart tech like the ATMs. If disparities in data exist, lessons can be learned about why, and ultimately, processes and reporting can be improved.

Real benefits to widespread adoption

CDOT is not going at it alone. State DOTs across the country are working collectively as members of the [Work Zone Data Working Group](#), coordinated by the U.S. Department of Transportation Intelligent Transportation Systems Joint Program Office (ITS JPO). The group, comprised of more than 100 transportation-related organizations, meets regularly to work through challenges, share knowledge, ask questions, and refine WZDx for current and future users. Representatives include people from State and local DOTs, the construction industry, auto manufacturers, and mapping companies. The working group is open to anyone who wants to participate.

“Many contractors and local jurisdictions look to CDOT for ways work zone information can be better managed and publicly shared,” says Nysten. “The more we can communicate worker presence and anything we can do to make a work zone safer is what’s important. With WZDx, there’s an opportunity we didn’t want to miss.”



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