VIEWPOINT

CONNECTIVITY-TESTING LEADERSHIP BY THE MICHIGAN DEPT. OF TRANSPORTATION

AUTO BEAT DAILY

Michigan's Dept. of Transportation has been a leader in testing and evaluating advanced mobility technologies for more than a decade. The department credits its philosophy of partnering with government, business and educational institutions for its deep involvement in projects across the state that are exploring the frontiers of vehicle connectivity and autonomous driving—including some 350 miles of roadways in southeastern Michigan that create "smart corridors" for real-world testing of vehicle-to-vehicle and vehicle-to-infrastructure communication. State Transportation Director Kirk Steudle describes the state's activities.

Kirk Steudle

How did MDOT become so proactive?

It started many years ago when we saw a press release from a Michigan carmaker about going to another state to do some testing. That got us thinking about what we could do locally, and that led to a series of discussions with Michigan carmakers and their suppliers about their transportation-related testing requirements. These days, if a company has to go elsewhere for what it needs, we want to know about it.

Where are MDOT's initiatives focused today?

Beginning several years ago, the industry's focus for next-generation safety systems was on connectivity. The idea was that driving could become safer and more efficient if cars were able to exchange information among themselves and their immediate environments about traffic conditions and road hazards. Since then, autonomous driving technology has been added to the mix. The two are independent capabilities, but there are obvious connections between the two.

Six years ago it made intuitive sense to enable data sharing among vehicles. But no one had tested it on a large enough scale to draw solid conclusions. MDOT partnered with the University of Michigan, the city of Ann Arbor and the Michigan Economic Development Corp. in an effort personally backed by Gov. Rick Snyder to win a pivotal federal test of connectivity.

The Michigan team was awarded a large U.S. Dept. of Transportation grant in 2011 to test connectivity on Ann Arbor streets. The project deployed a fleet of nearly 3,000 cars, trucks, buses and motorcycles in Ann Arbor that were equipped to connect with each other and an array of stationary data sources. The program ran for three years and collected a huge amount of data that verified the safety potential of connectivity.

What happened next?

The Ann Arbor project led to an even bigger "Smart Corridors" state-federal program in 2014 that was backed by Ford and General Motors. The project began with 125 miles of specially equipped highways that formed a huge triangle across southeastern Michigan that "touched" the home offices of all three of the traditional domestic carmakers. Since then, the network has been expanded to 350 miles of roadway and connects many more vehicles.

We've also significantly increased the deployment of roadside vehicle-to-infrastructure connectivity. We currently have about 155 roadside units that can communicate a variety of messages to vehicles. We believe Michigan's Smart Corridors project is the largest real-world deployment of connected-car technology anywhere.

What's an example of the technologies you are evaluating?

One involves linking cars with the phasing of traffic lights. Special traffic signals broadcast continuous details in real time about when they sequence from green to yellow to red and back to green again. Test cars detect the signals and compare the information with their own speed and direction. They can then calculate whether they will make the next light or need to slow down and stop. Right now the system alerts the driver about what to do. But you can see how this capability also could be used by an automated driving system to prevent vehicles from running red lights.

What other safety features are being tested?

This summer, 3M Co. joined the Smart Corridors project with three separate test programs. One involves determining what kinds of painted lane lines are best to help autonomous cars position themselves in traffic.

Another project is testing barcodes at construction sites that can convey far more information to a properly equipped car than can be conveyed with conventional signs. For example, the barcodes could relay the work zone speed limit, the location of workers ahead, whether the site is active at the moment and how far ahead the regular speed limit will resume.

A third 3M test addresses an issue we hear about frequently. In Michigan, the speed limit in a construction zone is 45 mph when workers are present. Drivers want to comply, but it can be difficult to tell whether a construction site is active or not as they approach. 3M is equipping workers' orange safety vests with a microchip. The chips can then alert an approaching car when and where workers are present—even when they're hidden from the driver's line of sight.

MDOT Michigan Department of Transportation

When will these technologies be available to the public?

The features we're testing require cars that are equipped to capture and process signals, so it can't happen overnight. But the industry is moving very rapidly to implement vehicle-to-vehicle and vehicle-to-infrastructure communications. Thanks to the testing we've already done in Michigan, the U.S. DOT is proposing to mandate that carmakers begin phasing in connectivity a few years from now.