

The future of automotive safety: Cars that talk to each other to prevent crashes

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WASHINGTON (AP) -- As a safety demonstration, it was a heart-stopper: A Ford Taurus was seconds away from cruising through an intersection when suddenly a row of red lights pulsed on the lower windshield and a warning blared that another car was approaching fast on the cross street.

Braking quickly, the driver stopped just as the second car, previously unseen behind a large parked truck, barreled through a red light and across the Ford's path.

The display at a recent transportation conference was a peek into the future of automotive safety: cars that talk to each other and warn drivers of impending collisions. Later this summer, the government is launching a yearlong, real-world test involving nearly 3,000 cars, trucks and buses using volunteer drivers in Ann Arbor, Mich.

The vehicles will be equipped to continuously communicate over wireless networks, exchanging information on location, direction and speed 10 times a second with other similarly equipped cars within about 1,000 feet. A computer analyzes the information and issues danger warnings to drivers, often before they can see the other vehicle.

On roadways today, the Taurus in the demonstration likely would have been "T-boned" - slammed in the side by the other car. There were more than 7,800 fatal intersection accidents on U.S. roadways in 2010.

Called vehicle-to-vehicle communication, or V2V, more advanced versions of the systems can take control of a car to prevent an accident by applying brakes when the driver reacts too slowly to a warning.

V2V "is our next evolutionary step ... to make sure the crash never happens in the first place, which is, frankly, the best safety scenario we can all hope for," said David Strickland, administrator of the National Highway Traffic Safety Administration.

V2V technology holds the potential to help in most crashes that aren't alcohol or drug related, Strickland said. But a lot will depend on how drivers respond to the warnings, and that's one reason for the Ann Arbor test. Overall, more than 32,000 people were killed in traffic accidents last year.

In addition to warning of cars running red lights or stop signs, "connected cars" can let drivers know if they don't have time to make a left turn because of oncoming traffic. When driving on a two-lane road, the systems warn when passing is unsafe

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because of oncoming cars - even vehicles around a curve that the driver can't see yet.

In a line of heavy traffic, the systems issue an alert if a car several vehicles ahead brakes hard even before the vehicle directly in front brakes. And the systems alert drivers when they're at risk of rear-ending a slower-moving car.

It's also possible for connected cars to exchange information with traffic lights, signs and roadways if states and communities decide to equip their transportation infrastructure with similar technology. The information would be relayed to traffic management centers, tipping them off to congestion, accidents or obstructions. If cars are reported to be swerving in one spot on a roadway, for example, that could indicate a large pothole or obstruction. The constant stream of vehicle-to-infrastructure, or V2I, information could give traffic managers a better picture of traffic flows than they have today, enabling better timing of traffic signals to keep cars moving, for example. Correspondingly, cars could receive warnings on traffic tie-ups ahead and rerouting directions.

NHTSA has been working on the technology for the past decade along with eight



automakers: Ford, General Motors, Honda, Hyundai-Kia, Mercedes-Benz, Nissan, Toyota and Volkswagen.

"We think this is really the future of transportation safety, and it's going to make a huge difference in the way we live our lives," said Scott Belcher, president of the Intelligent Transportation Society of America, which promotes technology solutions to transportation problems.

The technology is already available, said Rob Strassburger, vice president for safety of the Alliance of Automobile Manufacturers. He said what's needed is for the government to set standards so that all automakers use compatible technology.

Since V2V relies on wireless technology, ensuring that the safety systems are reliable and can't be hacked is another concern, NHTSA officials said.

The safety benefits of V2V won't be fully realized until there is a critical mass of cars on the road that can talk to each other, and just where that point lies isn't known. By the time the government sets standards and automakers are able to respond, it may be 10 years before the technology is widely available on new cars. It takes about 30 years for a new technology to work its way into the entire population of cars.

Creating consumer demand for the technology could speed up its introduction, Strassburger said. There's already demand for information on traffic tie-ups and rerouting that drivers can download to their smartphones, he said.

Automakers dislike government mandates requiring them to add technology to cars, but that's probably what's needed, said Clarence Ditlow, executive director of the Center for Auto Safety, a consumer group.

"If you have the technology, and the price has gone down so much, use it," he said. "You aren't going to get it into the marketplace as fast as you could and save as many lives as you could unless you mandate it."

Some of the safety technologies for V2V are already available in cars, although they tend to be offered primarily on higher-end models. Lane departure systems, for example, warn drivers when their vehicle unintentionally wanders from its lane, and some can automatically steer the car back. Blind spot systems warn drivers of vehicles in adjacent lanes, and some can also steer away from hazards. Forward collision warning systems alert drivers to impending crashes, and some can automatically brake if the driver doesn't respond. Adaptive cruise control automatically adjusts vehicle speed to maintain a set distance from the car ahead in the same lane. Adaptive headlights change their aim in conjunction with the steering wheel. Parking sensors and rear-mounted cameras help a driver parallel park without scraping paint, bumping fenders or hitting pedestrians.

A key difference is that most of the current technologies rely on radar or laser sensors to "see" other nearby vehicles. They can't warn drivers about cars they can't see, such as the car that ran the red light in the intersection demonstration, or an oncoming car around a curve in the road.

Together, the currently available technologies and the future V2V systems may effectively form a kind of autopilot for the road. Said Strassburger: "The long-term trajectory for these technologies is the vehicle that drives itself - the driverless car."

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