



of these sensors is limited to a few car lengths, and they cannot see past the nearest obstruction.

Car-to-car communication should also have a bigger impact than the advanced vehicle automation technologies that have been more widely heralded. Though self-driving cars could eventually improve safety, they remain imperfect and unproven, with sensors and software too easily bamboozled by poor weather, unexpected obstacles or circumstances, or complex city driving. Simply networking cars together wirelessly is likely to have a far bigger and more immediate effect on road safety.

Creating a car-to-car network is still a complex challenge. The computers aboard each car process the various readings being broadcast by other vehicles 10 times every second, each time calculating the chance of an impending collision. Transmitters use a dedicated portion of wireless spectrum as well as a new wireless standard, 802.11p, to authenticate each message.

Krishnan took me through several other car-to-car safety scenarios in the company's parking lot. When he started slowly pulling into a parking spot occupied by another car, a simple alert sounded. When he attempted a risky overtaking maneuver, a warning light flashed and a voice announced: "Oncoming vehicle!"

More than five million crashes occur on U.S. roads alone every year, and more than 30,000 of those are fatal.

The prospect of preventing many such accidents will provide significant impetus for networking technology.

Just an hour's drive west of Warren, the town of Ann Arbor, Michigan, has done much to show how valuable car-to-car communication could be. There, between 2012 and 2014, the National Highway Traffic Safety Administration and the University of Michigan equipped nearly 3,000 cars with experimental transmitters. After studying communication records for those vehicles, NHTSA researchers concluded that the technology could prevent more than half a million accidents and more than a thousand fatalities in the United States every year. The technology stands to revolutionize the way we drive, says John Maddox, a program director at the University of Michigan's Transportation Research Institute.

Shortly after the Ann Arbor trial ended, the U.S. Department of Transportation announced that it would start drafting rules that could eventually mandate the use of car-to-car communication in new cars. The technology is also being tested in Europe and Japan.

There will, of course, also be a few obstacles to navigate. GM has committed to using car-to-car communication in a 2017-model Cadillac. Those first Cadillacs will have few cars to talk to, and that will limit the value of the technology. It could still be more than a decade before vehicles that talk to each other are commonplace. ■