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Drive by Wire—The Dream Becomes an Incremental Reality

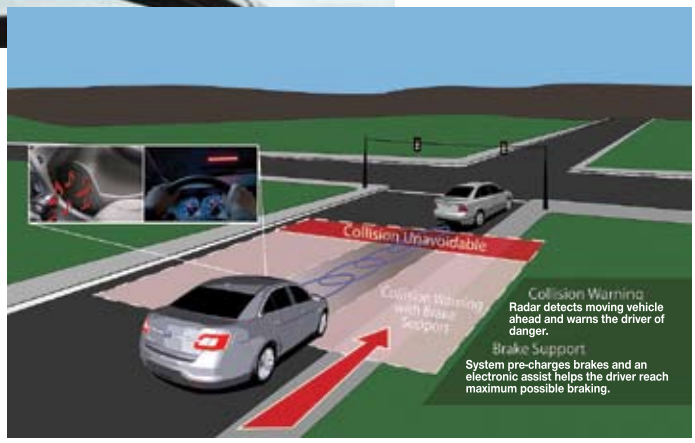
News reports on this car crash were reported throughout the world: On July 26, 2009, a driver entered the Taconic State Parkway through an exit ramp. She was driving in the wrong direction on the parkway when she crashed head-on into another vehicle. Since the cars were traveling in the same path from opposite directions, the impact force equaled the sum of their two separate velocities. This accident killed eight people.

When I first heard about this, I wondered if new emerging technologies could have prevented the crash. This month, my column explores new cars that have been given what General Motors likes to refer to as a "sixth sense" to help keep their drivers from crashing into people, cars, or other stationary or moving objects.

The dream of autonomous vehicle navigation was, as far as I can document, introduced at the GM exhibit at the 1939 New York World's Fair. Its drive-by-wire concept hasn't changed since it was first introduced over 70 years ago. It has always called for the transfer of the control of a vehicle from the driver to an automated system that controls the vehicle's steering, engine throttle, and brakes. What has changed over the past 70 years is the available technology that engineers can use to turn this basic concept into a reality.

The 1964 GM World's Fair exhibit demonstrated vehicles that drove themselves. The exhibit's cars received speed and steering instructions from many buried roadbed control units that were placed at strategic locations throughout the ride. However this approach, and the technology that it was based on, could not be scaled up to control cars on real highways.

Today's automotive engineers are now taking an incremental approach to turn new car safety technologies, over time, into an autonomous vehicle navigation system. Daimler Motors is currently the leader when it comes to applying these new technologies for automotive safety. The 2010 Mercedes E-Class and S-Class have an optional driver-assistance package that uses active radar and cameras to control a car's speed,



Images courtesy Ford Motor Co.

Windshield red alert (above), part of the collision warning system with brake support (at right)

inform the driver that the car's blind spots are occupied, warn the driver if the vehicle is drifting out of its lane, stir the driver if the system sees signs of driver fatigue, and stop the car if an accident becomes imminent.

These safety features are also now available on a number of other luxury-brand cars. However, for this technology to have an impact on automobile accidents, these systems need to be installed in cars with reasonable price tags. The good news is that Ford is now placing active radar in some of its 2010 models including its reasonably priced (under $30,000) Taurus.

The Ford radar system will monitor traffic up to 600' ahead of the vehicle. It combines this long-range viewing with a mid-range view designed to detect objects closer than 200'. The radar system looks ahead for what is coming and also keeps "an eye out" for vehicles or pedestrians that suddenly cross into the vehicle's path. It will activate an audible warning and a "red alert" across the windshield when slow traffic or pedestrians are first detected. If the driver doesn't react, the system will slow down or stop the car on its own, and then return to its set speed when the traffic conditions allow. If a crash becomes imminent, the system will give the same warnings, tighten the cars' seatbelts, and apply the proper braking action to avoid the accident.

In driving tests, Ford engineers turned over the full throttle and brake control to the system while driving in traffic on the New Jersey Turnpike. They set the vehicle active cruise control to 70 miles per hour and the car automatically varied its speed to match driving conditions.

The Ford system also includes

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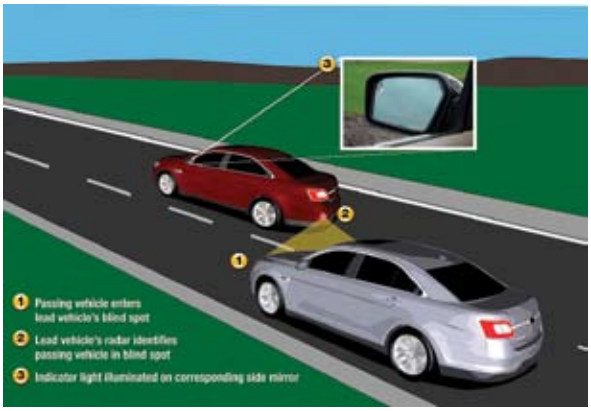
two multi-beam blind spot radar modules that are mounted in the back panels of the vehicle. This part of the active radar system monitors traffic in surrounding lanes. When an approaching vehicle enters the car's left or right blind spot, a warning light appears in the corresponding side view mirror. The radar in the backside panels also provides a cross-traffic alert when the vehicle is backing up. This is especially useful when trying to back out of a parking space where the cars on either side make it impossible for the driver to see oncoming cross traffic or pedestrians. The system will warn you if movement is detected up to three car widths on either side of your vehicle.



Blind spot information system

Could the Taconic State Parkway accident, mentioned at the start of this column, have been prevented if both vehicles had operational active radar safety systems?

Recalling the Facts

1. Do you think active radar could have prevented the accident described at the start of this column? Why?

2. If cost wasn't a factor, what new safety enhancement would you like to see installed on new cars? td