

Today and Tomorrow: Technology Continues Making Travel Even Safer and More Efficient

Driving will always involve the use of vehicle technology, and as global innovation leaders, automakers have used technology to enhance safety and reduce distraction. Whether it's turning on the windshield wipers, the radio, or GPS; automakers employ thousands of researchers and invest billions of dollars in carefully designing vehicle features that function safely in real-world situations with real-world drivers. The auto industry's researchers and engineers use human factors expertise and data on driver behavior to make technologies as easy-to-use as possible... to help keep drivers' "eyes-on-the-road." That's important because research shows that 80 percent of all crashes involved the driver looking away from the forward roadway just prior to the crash. (Virginia Tech Transportation Institute's 100 Car Study).

Today, technology offers:

- **Guidance systems that help drivers focus on the road, not their maps.** GPS systems are engineered to work as safely as possible to communicate important information a driver might otherwise struggle to read from an open map. And, even better, if a driver misses a turn, or deviates from the course, navigation systems immediately, and automatically, re-route them. There's no need to flip through a map book to chart a new course.
- **Auto communications systems that save lives.** A communications signal into and out of a vehicle allows systems to work quicker in an emergency. Not only when a driver needs to call 911, but when they can't call 911... that's when Automatic Crash Notification (ACN) can make the call. ACN can reduce the time it takes for first responders to become aware of a crash. Reducing notification and response times is critical to saving even more lives. One analysis of fatal accidents found that, on urban interstates, reducing incident notification times from 5.2 minutes to two minutes can further decrease road traffic fatalities by up to 15 percent. In the future, systems may allow drivers to add a personalized profile of their important health information into the vehicle, so vital facts like blood type, allergies and health information can automatically be sent to first responders when it matters most: as soon as a crash happens.
- **New ways of providing drivers with important information with reduced distraction.** Haptic controls, which use a sense of feeling to communicate with vehicle operators, can allow drivers to keep their "eyes-on-the-road" rather than look at a display. For example, when a vehicle drifts from its lane, the steering wheel could warn the driver by vibrating. Why vibrate? Because many motorists already associate that sensation with driving over a roadway edge's rumble strips. Haptic controls allow the driver to be alerted without taking their eyes off the road to look for a visual warning. Audible warnings that a driver hears can also provide an alert to potentially hazardous events without drawing a driver's eyes from the roadway.

- **Features that help manage in-vehicle distractions.** Features such as automatic windshield wipers and headlights can quickly turn-on when rain starts or it gets dark, so the driver has fewer things to do while focusing on the road.
- **Heads-up displays can put important information right in front of a driver.** Critical updates like vehicle speed, adaptive cruise control details and navigation instructions can be given to drivers through an easy-to-read, high-contrast message that's put directly in the driver's field of view. Heads-up-displayed messages appear to "float" above the hood in the vehicle front.

Tomorrow, technology promises:

- **Road hazard notification that alerts drivers to problems ahead, long before they can see them.** Knowing the bridge ahead is out... or a construction zone has reduced the road to one lane... or the fire department has shut down a road... or any number of sudden traffic developments is information that drivers may soon be able to get in real-time updates.
- **More assertive warnings about upcoming road conditions.** If a vehicle is traveling at a speed faster than what's recommended for an upcoming curve in the road, for example, developing technology can warn the driver, therefore reinforcing existing road signage that might already be in place warning of the upcoming curve in the road.
- **Systems that intervene automatically to prevent, or reduce the severity of, imminent crashes.** Vehicles that detect a crash is imminent may automatically deploy the brakes to reduce crash severity or avoid it altogether. A vehicle also can tighten safety belts, readjust seat positioning, close windows and more. All of this can provide vehicle occupants with enhanced safety protection, and all of this can happen before the crash even occurs.
- **Connectivity among different highway users.** By connecting thousands of vehicles using the same transportation system at a particular time, transportation managers can better keep track, and control, of system performance. Maybe adjust a traffic light to handle a sudden back-up... alert emergency responders to a motorist in need of help... dispatch a maintenance crew to fix a pothole. Technology and connectivity will play a role in all of this.
- **More protection from other vehicles.** Connected vehicles can also warn of another car approaching the same intersection; alert a driver of another vehicle drifting into their lane before it's visibly noticeable; pass along word of thunderstorms or slippery roads a mile ahead; and help a driver detect where the lane markers are on a snow-covered road. All of this, and more, will be possible with technology that wirelessly connects vehicles.

- **Information that allows drivers to make decisions that reduce travel time. Whether it's choosing the route with less traffic, or avoiding road construction, technology can bring drivers information that helps them choose the most efficient route.** U.S.highway users annually spend 4.2 billion hours in traffic. That's nearly one full work week for every traveler. In 2007, the overall cost of wasted fuel and lost productivity reached \$87.2 billion – more than \$750 for every U.S. traveler. Reducing travel time has an environmental benefit as well: in 2007 the total amount of wasted fuel topped 2.8 billion gallons – or three weeks' worth of gas for every traveler, according to the Texas Transportation Institute.