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GM Develops Vehicles with a Sixth Sense

- **Vehicle-to-vehicle communication aims to prevent collisions**
- **GPS and WLAN offer effective way to observe surrounding traffic**

Rüsselsheim/Dudenhofen. Preventing accidents by warning drivers about potential danger from other vehicles was a major goal during the development of the new General Motors V2V (vehicle-to-vehicle) communication systems. Vehicles equipped with this technology can communicate with each other and exchange information such as location and speed. Drivers can then be warned in advance if another car is traveling in their blind spot, stopped in an area that is difficult or impossible to see, or about to enter the same intersection as they are. GM engineers demonstrated the current status of V2V development with Cadillac, Saab, Opel and Chevrolet cars at the Dudenhofen Test Center in Germany.

“Driving is a very complex task. Knowing where the other guy is and where he’s headed can be as critical as being in control of your own vehicle,” said Hans-Georg Frischkorn, Executive Director, Global Electrical Systems, Controls and Software. “With V2V technology, we intensify the driver’s awareness of his environment to improve road safety, without any distraction to him and certainly without reducing his level of control. This sixth sense lets drivers know what’s going on around them to help avoid accidents and improve traffic flow.”

For these systems, GM uses proven, reliable components that are part of everyday life. The hardware consists of a microprocessor, GPS receivers (Global Positioning System) and Wireless LAN modules.

The vehicles establish communication within a few hundred meters of one another and exchange information such as location, speed, acceleration and direction of travel.

Today, vehicles can be equipped with multiple safety sensors, including radar-based sensors connected with speed control devices, lane change assistance systems or sensors to detect objects in a car's blind spot. GM can increase the operating range and coverage of individual sensors significantly with its comprehensive technology - a more effective and affordable way to provide extensive observation and assessment of the surrounding traffic conditions

Demonstration with typical driving situations

GM engineers demonstrated the new technology's advantages with a range of practical exercises. A warning system minimizes the danger of a driver overlooking another vehicle in their car's blind spot. Several functions help prevent the rear-end collisions that occur on a daily basis due to poor visibility, twisty roads or short lapses in driver concentration. The system warns of a stationary vehicle on the road even before the driver behind can see it, for example around a corner, or alerts the following traffic of a car making an emergency stop. When a car registers that it is in danger of being rear-ended, it flashes its tail lights rapidly. Warnings inside the approaching car also alert its driver, who then still has enough time to perform a braking or avoidance maneuver. Depending on the situation, the system transmits these warnings visually, acoustically or through vibrations in the driver's seat.

In another scenario, a collision warning system improves safety while approaching intersections. Even if there is no visual contact between the drivers of two cars, the system detects any collision danger in advance and alerts both drivers if they need to intervene, for example by braking. Work zones or emergency vehicles can also transmit signals to drivers if a lane is closed or a path needs to be cleared.

Goal: Wide availability for as many vehicles as possible

GM has deliberately based this technology on inexpensive, proven components, giving it the potential to become standard equipment in many vehicles. The alternative would be to offer extremely expensive high-tech systems for just a few cars, but as Hans-Georg Frischkorn says: "GM has always been committed to democratizing innovations. Our V2V systems are affordable and could potentially be used in every vehicle class. That's especially important because cooperative systems like these become more effective when many vehicles are equipped with them."

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