'Smart' Cars

As his car approaches a corner, the driver is distracted. He doesn't see a truck coming from the right. Watch out! There's going to be a crash!

Just in time, the car brakes and stops, and the truck roars by. Phew! That was close! But it wasn't the driver who responded quickly. It was the car itself that applied the brakes to avoid a collision.

Sound far-fetched? It's not. You might be driving a 'smart' car like this before too long.

Techie co-pilot

At the Massachusetts Institute of Technology (MIT), researchers are working on a car safety system that monitors the driver's performance and takes over the wheel if he or she is about to do something unsafe. For instance, if a driver nods off and veers close to a barrier, the system takes control of the vehicle, steering it back to safety.

The driver might not even know that the co-pilot had been activated.

"You would likely just think that you're a talented driver," says Sterling Anderson, who helped develop the technology. "You'd say, 'Hey, I pulled this off.' [You] wouldn't know that the car is changing things."

Taking over the wheel

But why use human drivers at all? Technology can process information about a vehicle's surroundings faster than a human can. So why not develop self-driving cars? That way, drivers can sit back and take a nap, read a book or send text messages without worrying about crashing.

DID YOU KNOW?

Nevada, Florida and California are the only U.S. states that allow testing of driverless cars on public roads. In Canada, self-driving cars are not legal anywhere.

In fact, vehicles that drive themselves are already being tested in Germany and the United States. These cars use **GPS**, video cameras, radar and online **navigation** features to

DEFINITIONS

GPS: a system for determining position on the Earth's surface by comparing radio signals from several satellites

NAVIGATION: the guidance of vehicles from place to place

detect pedestrians, cyclists and other vehicles. Then, onboard computers create a virtual **buffer zone** around these obstacles that the car avoids.

Follow the leader

Meanwhile, on a highway in Spain, carmaker Volvo is testing 'road trains.'

Road trains are long lines of cars hooked together by wireless links. Each train follows a lead vehicle. Cruise control systems ensure that the cars all drive the same speed. On-board sensors stop vehicles from getting too close to one another.

At any time, drivers can enter or leave the road train.

Cars that talk to each other

Another area of research? Cars that talk to each other using wireless road signs and signals.

Under this system, vehicles transmit their location, speed and direction. Other cars with the same technology then use this data to stay at a safe distance. Meanwhile, traffic signals pass on information about hazards, **congestion** and best driving routes.

"It opens the possibility of not just reducing the number of crashes, but preventing them," says U.S. Transportation Secretary Ray LaHood.

Reality check

However, there are problems to solve before these cars become part of our everyday lives.

At present, self-driving cars cannot be legally operated on most public streets. And if they were eventually to be allowed on our roads, there will be other legal questions. For example, what if the car's safety system fails and there's an accident? Is the driver to blame? The car manufacturer?

Security is another issue. Modern cars are computers on wheels. These computers control engines, brakes, navigation, lighting, **ventilation** and entertainment. What if they fell victim to a **cyber** attack?

"If your laptop crashes you have a bad day. If your car crashes that could be life threatening," says researcher Bruce Snell.

What's more, if our cars drive themselves, or correct our mistakes, what would happen to our driving skills? Would

we be able to drive in an emergency? Science journalist Bob MacDonald says even airline pilots with automatic landing systems must keep their flying skills sharp by practicing **manual** landings. Similarly, it would be important for drivers to maintain their driving abilities.

Finally, are motorists really ready to trust the technology? Would you feel comfortable being passed on the highway by a driver reading a newspaper?

Saving lives

Still, many are excited that these cars could be available within a decade. After all, 1.2 million people die in traffic every year – and human error is to blame for 90 to 95 percent of vehicle fatalities.

"We might be able to cut those down by … 50 percent," says Sebastian Thrun, of Stanford University. "Just imagine all the funerals that won't take place." ★

DEFINITIONS

buffer zone: a neutral area created to lessen the chance of a collision
congestion: excessive crowding
cyber: relating to computers and the Internet

manual: operated by a person instead of automatically or using a computer
ventilation: the act of supplying fresh air and getting rid of foul air