



ICT ON THE ROADS

ON THE ROAD TO SUCCESS

Thousands of people die on European roads each year, costing society billions of euros and untold misery for the friends and families of victims. Strong road safety policy, legislation and sustained research funding — especially for active ICT-based safety systems — have all worked together, cutting the number of deaths by half since 1990.

Do you stop to think that you are risking your life when you go out in your car? Almost certainly not. You expect your car to stay on course, even if you corner a little too sharply; you assume that the brakes will stop you in time, even on a wet and slippery road. And you would never expect another driver to jump a red light.

Yet thousands still die each year on Europe's road. Even at slow speed, mistakes behind the wheel can be fatal or cause serious injury.

And what price does Europe pay? A staggering 35 000 deaths, many more serious injuries and misery for many more friends and family. Plus a cost to the European economy in the region of EUR 200 billion — medical treatment, legal costs and lost productivity quickly add up.

The EU takes a balanced attitude to road travel. It favours public transport as a much greener option, yet supports efforts to improve road travel. And safety on the road has taken top priority for over a decade.

Europe has always worked closely with European carmakers and other road transport stakeholders to improve the region's safety record. Over the past 15 years passive systems, such as seatbelts, airbags and protective bodywork structures have been introduced as mandatory safety features in vehicles.

In 1988 the European Community launched its 'Dedicated road infrastructure for vehicle safety in Europe' (DRIVE) programme to fund research into transport informatics and telecommunications. Since then, developments in ICT (especially mobile wireless communication technologies) have opened up the exciting new area for active safety technologies that have the scope not simply to mitigate damage but avoid accidents entirely.

Technologies first tested in the 1990s are now found in many road vehicles. The eCall system, for example, traces its ancestry back to the Fifth Framework Programme.

This pan-European in-vehicle emergency call system could save some 2 500 lives in the EU each year and cut serious injuries by 15 %. It will be fitted as standard in the majority of new European cars from 2011.

STABILITY RESEARCH

Electronic stability control (ESC), also pioneered by European car and automotive equipment manufacturers with EU backing, prevents cars from skidding because onboard sensors continuously monitor the movement of the car and wheels, automatically applying the brakes on certain wheels in small bursts, and adjusting the engine torque to prevent skidding.

Extensive EU-funded research has proven that ESC can save lives; the technology is mandatory for all new cars sold in Europe from 2012.





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Onboard intelligent vehicle safety systems (ESC being among the first available) offer an extra set of eyes and ears for a driver. They integrate data from external monitoring devices and internal sensors to reduce a driver's workload and anticipate dangers.

Indeed, combining all of the information to hand, including much that is unavailable to the driver, the so-called 'smart car' could take split-second control of a vehicle in an emergency to avoid a collision.

But the latest research, driven by the Sixth and Seventh Framework Programmes (FP6 and FP7), goes a step further. Thanks to wireless connectivity between ICT systems, it is now possible for vehicles to 'talk' to one another, and even the road infrastructure.

Current EU research is exploring car-to-car and even car-to-infrastructure communication and data exchange. Cooperation between vehicles could help to avoid accidents (automatically slowing down cars behind an out-of-control vehicle, for example). Communication with traffic lights could improve traffic flows and fuel efficiency too.

The development of these technologies falls within the European Commission's flagship 'Intelligent car' initiative which is helping to shape research, and works in partnership with carmakers and other stakeholders to raise awareness of smart systems among consumers.

The European Commission also supports the Ertico network of intelligent transport systems and services stakeholders in Europe, which promotes the next generation of preventive safety systems and telematics and steers the research effort.

After all, research shows that almost all road accidents are avoidable, but none of us are perfect behind the wheel. Fortunately, Europe's R & D community has the momentum that will drive the development and adoption of life-saving intelligent safety systems. ■

PROJECTS IN FOCUS

Europe has always put citizen safety at the top of its road transport policy. Recognising early on that intelligent ICT-based systems could compensate for driver error, the EU has financed the development of a wide range of innovative safety solutions.

EYES ON THE ROAD TO SAFETY

Posh cars already learn how you like your seat and steering wheel adjusted. The next generation of cars may be smart enough to learn how you drive and warn you when you're not driving safely.

The Drivscop project has a prototype car with a system that tracks a driver's every move, matches those actions with what it 'sees' down the road, and learns how that driver normally handles situations such as upcoming curves or other vehicles ahead. With its infrared headlights, stereo cameras, and advanced visual processing the system can actually see better at night than a human driver.





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'What we wanted was a system that learns to drive during the day by correlating what it sees with the actions a driver takes,' says the project's Florentin Wörgötter. 'Then at night the system could say, "Slow down, a curve is coming up!" — a curve the human didn't see. Now we have a prototype that does this.'

Another EU project is looking to develop a multi-modal, multi-sensor and zero-distraction interaction interface for two-wheel vehicles on the move (Moveon). The idea is to channel information to motorbike police without distracting them. The system includes a special touch screen on the officer's jacket and a voice control system.

But most importantly, Moveon monitors the officer's heart rate and oxygen levels along with the movement of the motorbike so that it does not cause a distraction during a critical moment, say just as the officer veers round a bend in hot pursuit!

Meanwhile, new European technology, called time-triggered architecture (TTA) provides reliable, high-speed electronic safety systems for transport and other engineering problems. The system manages to contain errors within a single subsystem to prevent them from spreading to other parts of the network.

In the automotive sector, DaimlerChrysler, Renault and Siemens VDO have implemented TTA within an electronic braking system combined with adaptive cruise control. And in railways, Alcatel used TTA as the basis for an advanced network control system standard. ■

