



Cars that drive themselves can become reality within ten years

A new EU project SARTRE is being launched to develop and test technology for vehicles that can drive themselves in long road trains on motorways. This technology has the potential to improve traffic flow and journey times, offer greater comfort to drivers, reduce accidents, and improve fuel consumption and hence lower CO₂ emissions.

Just imagine leaving home in the morning and, just after joining the motorway, meeting up with a number of other cars which inch up to each other, travelling at normal speed in a close-formation convoy. After a few minutes you can let go of the steering wheel and spend your time reading the morning paper, talking on the phone or watching the TV, while your car drives itself in complete safety and also saving fuel! A vision of a motoring Utopia?

Not if you believe today's researchers who suggest that road trains can become reality within a decade.

The automotive industry has long been focused on the development of active safety systems that operate preventively, such as traction control and braking assistance programs. But automakers have also gone much further in proposing technology that allows vehicles to be operated without any input whatsoever from the person behind the wheel. Known as autonomous driving, this technology means that the vehicles is able to take control over acceleration, braking and steering, and can be used as part of a road train of similarly controlled vehicles.

The first test cars equipped with this technology will roll on test tracks as early as 2011. The vehicles will be equipped with a navigation system and a transmitter/receiver unit that communicates with a lead vehicle. Since the system is built into the cars, there is no need to extend the infrastructure along the existing road network.

Lead vehicle

The idea is that each road train or platoon will have a lead vehicle that drives exactly as normal, with full control of all the various functions. This lead vehicle is driven by an experienced driver who is thoroughly familiar with the route. For instance, the lead may be taken by a taxi, a bus or a truck. Each such road train will consist of six to eight vehicles.

A driver approaching his destination takes over control of his own vehicle, leaves the convoy by exiting off to the side and then continues on his own to his destination. The other vehicles in the road train close the gap and continue on their way until the convoy splits up.

Many advantages

The advantage of such road trains is that all the other drivers in the convoy have time to get on with other business while on the road, for instance when driving to or from work. The road trains increase safety and reduce environmental impact thanks to lower fuel consumption compared with cars being driven individually. The reason is that the cars in the train are close to each other, exploiting the resultant lower air drag. The energy saving is expected to be in the region of 20 percent. Road capacity will also be able to be utilised more efficiently.

"The SARTRE project brings together a unique mix of technologies, skills and expertise from European industry and academia, with the aim of encouraging the development of safe and environmentally effective road trains," explains Tom Robinson, SARTRE project coordinator, of Ricardo UK Ltd. "By developing and implementing the technology at a vehicle level, SARTRE aims to realise the potentially very significant safety and environmental benefits of road trains without the need to invest in changes to road infrastructure."

"I do appreciate that many people feel this sounds like Utopia, says Erik Coelingh, technical director of Active Safety Functions at Volvo Cars. However, this type of autonomous driving actually doesn't require any hocus-pocus technology, and no investment in infrastructure. Instead, the emphasis is on development and on adapting technology that is already in existence. In addition, we must carry out comprehensive testing to verify our high demands on safety."

Researchers see road trains primarily as a major benefit to commuters who cover long distances by motorway every day, but they will also be of potential benefit to trucks, buses, coaches vans and other commercial vehicle types. As the participants meet, each vehicle's navigation system is used to join the convoy, where the autonomous driving program then takes over. As the road train approaches its final destination, the various participants can each disconnect from the convoy and continue to drive as usual to their individual destinations.

Ends



NOTES TO EDITORS

About the SARTRE project: *The SARTRE project stands for Safe Road Trains for the Environment. Part-funded by the European Commission under the Framework 7 programme, SARTRE will be led by Ricardo UK Ltd and will comprise a collaboration between the following additional participating companies: Idiada and Robotiker-Tecnalia of Spain, Institut für Kraftfahrwesen Aachen (IKA) of Germany, and SP Technical Research Institute of Sweden, Volvo Car Corporation and Volvo Technology of Sweden.*

SARTRE aims to encourage a step change in personal transport usage through the development of safe environmental road trains (platoons). Systems will be developed in prototype form that will facilitate the safe adoption of road trains on un-modified public highways with full interaction with non-platoon vehicles.

The project will address the 3 cornerstone transportation issues of environment, safety and congestion while at the same time encouraging driver acceptance through the prospect of increased "driver comfort". The objectives of SARTRE may be summarised as:

- 1. To define a set of acceptable platooning strategies that will allow road trains to operate on public highways without changes to the road and roadside infrastructure.*
- 2. To enhance, develop and integrate technologies for a prototype platooning system such that the defined strategies can be assessed under real world scenarios.*
- 3. To demonstrate how the use of platoons can lead to environmental, safety and congestion improvements.*
- 4. To illustrate how a new business model can be used to encourage the use of platoons with benefits to both lead vehicle operators and to platoon subscribers.*

If successful, the benefits from SARTRE are expected to be significant. The estimated fuel consumption saving for high speed highway operation of road trains is in the region of 20 percent depending on vehicle spacing and geometry. Safety benefits will arise from the reduction of accidents caused by driver action and driver fatigue. The utilisation of existing road capacity will also be increased with a potential consequential reduction in journey times. For users of the technology, the practical attractions of a smoother, more predicible and lower cost journey which offers the opportunity of additional free time, will be considerable.

The SARTRE project formally started in September 2009 and will run for a total of three years.

About the SARTRE project partners:

SP Technical Research Institute of Sweden *is a leading international research institute. We work closely with our customers to create value, delivering high-quality input in all parts of the innovation chain, and thus playing an important part in assisting the competitiveness of industry and its evolution towards sustainable development.*

Ricardo plc *is a leading independent technology provider and strategic consultant to the world's transportation sector and clean energy industries. The company's engineering expertise ranges from vehicle systems integration, controls, electronics and software development, to the latest driveline and transmission systems and gasoline, diesel, hybrid and fuel cell powertrain technologies, as well as wind energy and tidal power systems. A public company listed on the London Stock Exchange, Ricardo plc posted sales of £178.8 million in financial year 2009. Ricardo will participate in the SARTRE project through its UK business, Ricardo UK Ltd. For more information, visit www.ricardo.com.*

The Robotiker-Tecnalia Technology Centre is an all-round supplier of contracted R+D+I, which has a complete range of services and products ranging from foresight and technology surveillance to new technology based business launching. Of this wide range of methods for collaborating with companies, development of R&D projects and technology consultancy services stand out. Robotiker-Tecnalia operates in its reference markets through five business units: ENERGY, TELECOM, AUTOMOTIVE, INFOTECH and INNOVA. This helps the technology centre to specialise by orienting research towards the needs of companies in these key sectors. Its main objective is to actively contribute to sustainable development in Society through Research and Technological Transfer. Over the years Robotiker-Tecnalia has taken part in more than 85 European projects, 24 of which remain ongoing.
www.robotiker.com

Volvo Technology Corporation is a Business Unit of the Volvo Group, which is one of the world's leading manufacturers of commercial transport solutions providing products such as trucks, buses, construction equipment, drive systems for marine and industrial applications as well as aircraft engine components. Founded in 1927, Volvo today has about 100,000 employees, production in 19 countries and operates on more than 180 markets. Volvo Technology Corporation is an innovation company that on contract basis invents researches, develops and integrates new product and business concepts and technology for hard as well as soft products within the transport and vehicle industry. Volvo Technologies primary customers are the Volvo Group Business Areas & Units. In addition, Volvo Technology participates in national and international projects in certain strategic areas, organised in common research programmes. For more information see www.tech.volvo.com.

IDIADA, as a global partner to the automotive industry, provides complete solutions for automotive development projects worldwide. IDIADA's Technical Centre is located 70 km south of Barcelona (Spain), having subsidiaries and branch offices in several European and Asian countries with a total work force of around 800 employees. The core services IDIADA provides are: Engineering, Proving Ground and Homologation. Main fields of engineering activity are power train, emissions, noise & vibration, vehicle dynamics, braking systems, fatigue & durability and passive safety.

IDIADA's proving ground is recognised as one of the best facilities in the world, and is renowned for the quality of its customer service. As a multi-user facility, safety and confidentiality are of the highest priority. Weather conditions make this facility the first choice regardless of the type of testing.

The Institut für Kraftfahrzeuge of the RWTH Aachen University (ika) with its centennial history is engaged in education and in industry-orientated research on vehicles - e.g. cars, commercial vehicles, busses and motorcycles - as well as neighbouring issues such as traffic and environmental conditions (noise, exhaust gas, etc.). ika is headed by Univ.-Prof. Dr.-Ing. Lutz Eckstein. In 2009 ika had more than 200 employees. IKA increasingly links research projects with development tasks that have to be financed by third-party funding. ika's activities are tailored to industrial demands and comprise the departments: Chassis - Body - Drivetrain - Acoustics - Electronics - Driver Assistance - Strategy and Process Development. The Driver Assistance department focuses on the development and assessment of driver assistance systems. Since the first introduction of advanced driver assistant systems (ADAS) ika has been one of the leading test facilities for independent tests and certifications of the system's components and overall applications.

Volvo Car Corporation is one of the car industry's strongest brands, with a long and proud history of world-leading innovations. Volvo sells around 400.000 cars per year in about 120 countries and comprising some 2,000 sales outlets and service workshops around the world. Volvo Car Corporation's headquarter and other corporate functions are based in Gothenburg, Sweden. For more information, please check www.volvocars.com.

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