

PRESS RELEASE

17 September 2012

SARTRE road train delivered

Joining a road train and leaving monotonous motorway driving to modern technology could be the future for road travel, using technology developed by Ricardo together with Volvo and other partners in the ground-breaking SARTRE (Safe Road Trains for the Environment) European research project

Tapping away on a tablet computer or smartphone or reading a book while driving on a motorway towards a sunny holiday beach or an important job appointment has previously been something that only passengers have been able to do. But thanks to project leader Ricardo, Volvo Car Corporation and the other partners in the SARTRE road train project, you may soon be able to take your hands off the wheel and your eyes off the road in your own car – leaving the automated driving to modern technology.

The SARTRE (Safe Road Trains for the Environment) project has involved seven European partners and has just been concluded with a major international demonstration event at the Volvo proving ground at in Hällered, Sweden. With members of the world's media in attendance, a platoon including a lead truck followed by four vehicles was driven autonomously at speeds of up to 90 km/h – in some cases with no more than a four-metre gap between the vehicles. SARTRE is the only project of its kind to focus on technology that can be implemented on conventional highways in which platooned traffic operates in a mixed environment with other road users.

“Road trains offer the potential to increase road space utilization, reduce emissions and improve the travelling experience for road users by freeing up valuable time,” commented Ricardo project director and chief engineer for the SARTRE project, Eric Chan. “At the same time, the technology developed in this project can improve road safety as the vehicles in the road train can respond almost instantaneously to the actions of the lead vehicle driven by its professional driver.”

The long-term vision of SARTRE is to create a transport system where booking, joining and exiting the road train will be smoother than leaving your car behind and using public transportation on long-distance trips. This allows drivers to enjoy the multi-tasking possibilities of public transportation behind the wheel of their own cars. At the same time, they have the flexibility of having their own vehicle for onward travel rather than having to look for a taxi or rental car when they leave the road train.

The road train brings several other crucial advantages:

- It promotes safer transport as a professional driver leads the vehicle platoon, for instance in a truck. Inter-vehicle reaction response times are very quick thanks to the co-ordinated technology.
- The environmental impact is reduced, as the cars drive close to each other and reap the benefit of lower air drag.
- The reduced speed variations improve traffic flow, creating more efficiently utilized road capacity.

The project estimates that the energy-saving potential is 10-20 percent compared to conventional road transportation.

Blend of present and new technology

The SARTRE road train includes a manually driven lead truck which is followed by one truck and three Volvo cars (S60, V60 and XC60). All the following vehicles are driven autonomously thanks to a blend of present and new technology.

“The vehicles share real-time information so are able to follow the movements of the lead vehicle while simultaneously coordinating their actions with each other,” says Eric Chan.

“To achieve this we have extended the camera, radar and laser technology used in present safety and support systems such as Adaptive Cruise Control, City Safety, Lane Keeping Aid, Blind Spot Information System and Park Assist Pilot,” adds Erik Coelingh, technical specialist at Volvo Car Corporation.

The most important new features that have been added to the vehicles are:

- A prototype Human-Machine Interface including a touch screen for displaying vital information and carrying out requests, such as joining and leaving the road train.

- A prototype vehicle-to-vehicle communication unit that allows all vehicles within the platoon to communicate with each other.
- Advanced software – developed by Ricardo – to control the automated vehicles and the road train as a whole.

Smooth operation

“Road train information and operation will of course be integrated in the Volvo Sensus infotainment system when the technology is ready for production. Booking, joining and leaving the road train must be easy and smooth,” continues Erik Coelingh. “Another challenge is to create a system that handles the cost aspects. It is logical that taking the road train will include a fee or an income, depending on whether you own a lead vehicle or a following vehicle.”

Stakeholder dialogue

Recognizing that the challenge of implementing road train technology on Europe’s highways is not solely a technical matter, SARTRE also includes a major study to identify what changes will be needed for vehicle platooning to become a reality. A number of stakeholder discussions have been held, bringing together technical experts, politicians, legislators and traffic safety researchers, among others. At the first workshops a number of non-technical challenges for road trains were discussed, such as legal regulations, product liability and driver acceptance of automated vehicles.

“There are several issues to solve before road trains become a reality on European roads. As the leader in car safety, Volvo Car Corporation is particularly focused on emergency situations such as obstacle avoidance or sudden braking. However, we are convinced that road trains have great potential,” concludes Erik Coelingh.

“Ricardo is proud to have led this important European research project and to have been actively involved in the development of many of the enabling control technologies deployed in the SARTRE road train,” commented Eric Chan. “While there remain challenges in terms of implementation – not least in terms of regulatory frameworks – the SARTRE project has successfully demonstrated a safe form of road train technology which can be implemented on existing highways without any requirement for infrastructure development.”

Ends

NOTES TO EDITORS:

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The SARTRE project stands for Safe Road Trains for the Environment. Part-funded by the European Commission under the Framework 7 programme, SARTRE is led by Ricardo UK Ltd and comprises collaboration between the following additional participating companies: Applus+, IDIADA and Tecnia of Spain, Institut für Kraftfahrzeuge (ika) of the RWTH Aachen University of Germany, and SP Technical Research Institute of Sweden, Volvo Car Corporation and Volvo Group of Sweden. www.SARTRE-project.eu.

SARTRE aims to encourage a step change in personal transport usage through the development of safe environmental road trains (platoons). Systems are being 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 is addressing the three 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 10-20 percent depending on vehicle spacing and geometry. Safety benefits will arise from the reduction of accidents caused by driver action and driver fatigue. The utilization 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 predictable and lower cost journey which offers the opportunity of additional free time will be considerable. The SARTRE project formally started in September. For more information see: www.SARTRE-project.eu.

Media contact:

Anthony Smith
Ricardo Media Office
Tel: +44 (0)1273 382710
Fax: +44 (0)1273 880218
E-mail: media@ricardo.com