

# ROAD TRAINS

At first sight, some transport innovations push the bounds of credibility. Platooning – involving convoys of vehicles controlled by one driver – certainly does that. Ian Norwell examines progress

The SARTRE truck trial culminated with an active platoon on a motorway near Barcelona

Transport engineers and fleet managers have embraced more technical changes in the last decade than ever before. If we had been told in 2004 that GPS-controlled predictive powertrains would be in production by now, many would have raised quizzical eyebrows. Such ideas surely belong to concept trucks on exhibition stands? But the fact is that, behind the kite-flying, some are serious. Separating the two is the trick, and so it has been with platooning and autonomous driving.

The idea of wirelessly connecting trucks in convoy has been around for some years. Mercedes-Benz was among the pioneers in the early '90s, with its 'electronic drawbar' project, using the old SK series heavy trucks. We've come a long way since then, with the evolution of sophisticated electronic safety and fuel-saving devices stealthily laying the foundations for today's iteration of platooning.

John Absmeier, director at Delphi's Silicon Valley Innovation Centre, puts the pace of progress into perspective. "These systems date back to 1999, when we developed the first ACC [active cruise control], using scanning radar. We've now moved to more advanced radar and vision systems that encompass the entire vehicle and enable features such as collision-mitigating braking, pedestrian detection and low-speed automated driving. Think about traffic jam assist for stop-start control."

Delphi is not alone. Indeed, most of the big auto makers – truck and car – have been involved in allied

developments at some stage. Look at the SARTRE project (safe road trains for the environment), funded by the European Commission under the Framework Seven programme, which aimed to develop strategies and technologies to allow vehicle platoons to operate on public highways.

SARTRE was led by Ricardo UK, which oversaw collaboration between Idiada and Robotiker-Tecnalia, of Spain, Institut for Kraftfahrwesen Aachen of Germany, SP Technical Research Institute, of Sweden, Volvo Car and Volvo Technology. That project ran from September 2009 and completed in 2012, with tests on Volvo's Hällered proving ground culminating in May of that year in a 200km trial on a section of public motorway near Barcelona. Three Volvo cars and one Volvo FH truck were used, and it marked the first ever platoon in live traffic.

## We got a convoy

As well as concluding that semi-autonomous 'follow the leader' road train technology was mature enough for practical application in the near future, the project participants declared that it could work on conventional highways in a mixed environment with existing road users. That's an ambitious statement, but SARTRE wasn't about fully autonomous driving, more a halfway stage. Instead of taking the human factor out of the equation altogether, similarly equipped vehicles communicated with each other to maintain a moving convoy behind a lead vehicle, operated by a professional driver.



**John Absmeier,**  
Delphi: "We've now moved to more advanced radar and vision systems"

# On TRACK?

Why do it? The potential gains in fuel economy, traffic control and safety could be significant. Further, advocates state that motorway platooning could pave the way for autonomous driving in urban and even rural environments, too. Then, the auto makers' dream of accident-free driving could be realised.

In the short term, however, managing short platoons of heavy trucks is predicted to bring an immediate 5% fuel improvement, due to the improved aerodynamics of a convoy alone. But allowing one driver to control a string of heavy trucks – three Swedish examples could weigh in at 156 tonnes – gives some cause for concern. A move to full autonomy might be seen as safer, with full-on platooning using the myriad of existing safety systems to get us there.

## Legal versus technical

However, as with many engineering innovations, platooning's *bête noire* will almost certainly not be technical, but political. Today's variety of 'assist' systems and the levels of reliable automation they demonstrate shows that the technologists are working well ahead of the legislature. Why? Because, according to the Vienna Convention, it is illegal not to have control over your own vehicle. Yes, that could be changed, but adapting legislation for EU member states might take 10 years. So for full autonomy to fly, legislators will need to overcome their inertia.

It's true that there are technical issues, but not many. Reliability must be on a par with an aircraft's autopilot before road trains can get a politician's stamp of approval. And transitions from surrendering control to the convoy to resuming independent driving must be bullet proof. It has to be absolutely clear who is responsible for driving a trailing vehicle, and exactly when that responsibility is transferred.

But, however challenging these technical challenges might appear, it looks certain that they will be solved long before the legislative landscape is fit to accommodate them. And that's a dilemma for OEMs' development engineers. Why create a system that is illegal in operation, and looks set to remain so for some time? In the late '90s, a leading engineer at a major truck maker showed a number of systems that were virtually ready to go. Steering by wire and full control by joystick were the most memorable, but he admitted at the time: "Why should I bother spending any more money when there is not the slightest sign of the necessary legislation shifting?"

Despite its recently-acquired appetite for YouTube



stunts, such as hanging the CEO out to dry over Gothenburg harbour and allowing supine technicians to work underneath moving trucks, Volvo remains a strong advocate of platooning. Following the DfT (Department for Transport) commissioning an investigation into HGV platoons, Carl Johan Almqvist, traffic and product safety director at Volvo Trucks, observed: "From a strict technical standpoint, this is possible much sooner than five years from now. The only hardware we don't have is the short-range communication between the vehicles. ACC and Volvo Dynamic Steering – both components that are necessary in platooning – are already in series production."

Fellow Swedish OEM Scania is also pushing the idea. In fact, Scania is taking a lead role in the next three-year EU research project, dubbed COMPANION. "We hope that this project will increase awareness in Europe of the many advantages of platooning," comments Sven-Åke Edström, senior vice president, truck, cab and bus chassis development. "Platooning will require standardised support systems as well as legislative action that will be clarified in this project," he adds.

It is to be hoped that auto and truck makers keep the faith and continue to work to bring platooning systems to market. The benefits, in terms of increased fuel efficiency, reduced congestion and improved safety are worth the time and money. Let's hope the legislators see the sense and work equally hard to resolve the remaining hurdles. **TE**



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