

# World's first licensed autonomous truck

*Mercedes-Benz Trucks recently introduced the Freightliner Inspiration Truck with Highway Pilot system as the world's first autonomous truck to be granted a license for road use in the State of Nevada. In July last year the company provided the world's first demonstration of an autonomous truck in action when the Mercedes-Benz Future Truck 2025 drove along a cordoned-off section of the A14 autobahn near Magdeburg explains Carola Pfeifle, Spokes Person Mercedes-Benz Trucks, Product Communications. She insists that Mercedes-Benz does not want to make truck drivers obsolete and instead stress that making some driving tasks a job for the computer can reduce accidents, improve fuel efficiency, and keep trucks on the road for longer.*

Daimler, which owns Mercedes-Benz, has been working on autonomous driving for two decades. Much of the technology in the Inspiration—the radars and cameras, the computing power and electrical architecture—has a long track record of commercial use in active safety features like lane departure warning and adaptive cruise control. Ms. Pfeifle points out that autonomous driving as a holistic function was studied as early as the 1990s in the EUREKA PROMETHEUS project. “Our work in this project focused on major highways. We were able to demonstrate that autonomous driving functions were basically

conceivable under highway-like conditions; autonomous driving in several lanes and/or in a convoy, automatic following of other vehicles, lane changes, and overtaking, for example. Naturally, we continued to work extensively on this issue after PROMETHEUS with the goal of developing systems that would be suitable for customers. One important result of our work is Proximity Control Assist, which benefited greatly from our work in the PROMETHEUS project.”

Ms. Pfeifle adds that the Promote Chauffeur research project presented in 1999 should also be mentioned

here, as it represents an early stage in the development of autonomous driving. In this project, an “electronic shaft” was used to link two tractor-trailers. The first vehicle was operated by a driver, while the second was fed all the data from the first, which allowed it to be steered, accelerated, and braked in the same manner as the first truck. It also consistently maintained a distance of between six and 15 meters from the first vehicle, depending on the speed of travel. The link was made possible by use of the sensor, data transfer, and vehicle control systems available at that time. There was also a radio connection between the two trucks and the onboard computers communicated with one another. Two video cameras in the second truck continually focused on a recognition pattern created by infrared lamps mounted on the rear of the first vehicle. As early as 1994, Daimler Group Research had already used a 7.5-ton test vehicle to demonstrate that trucks could be coupled electronically.



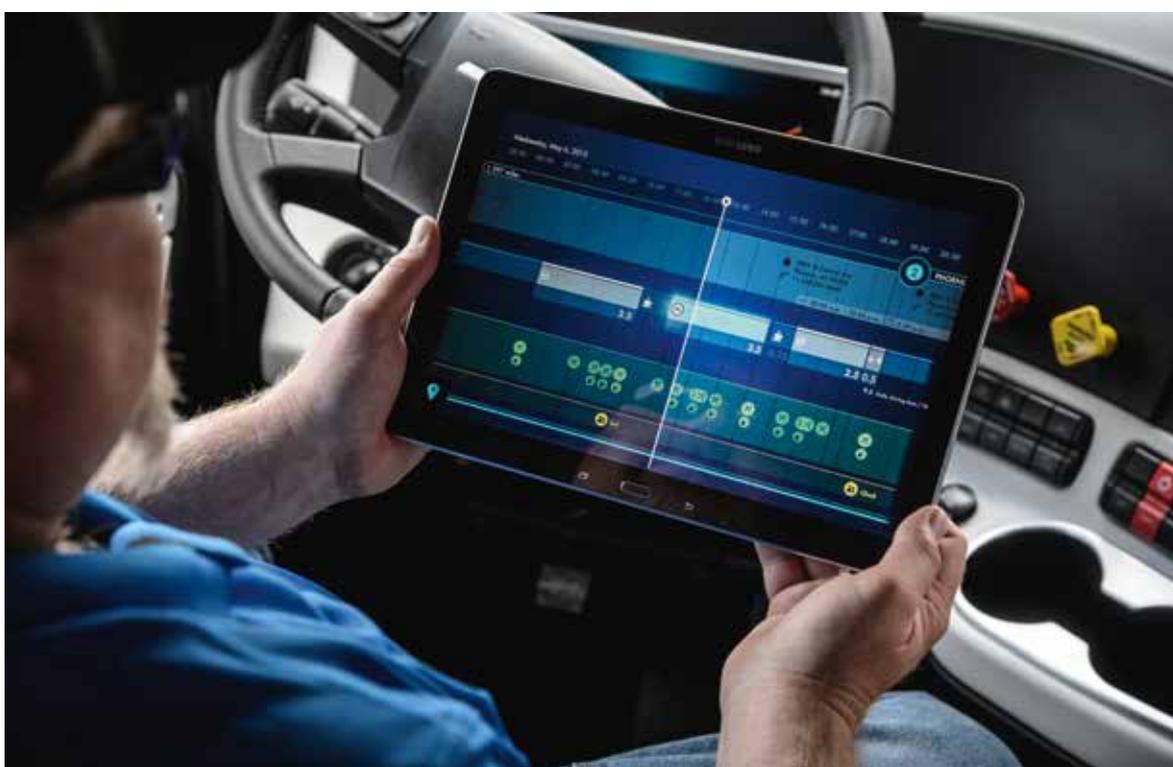


Work on the Inspiration, which notably features technology that allows the truck to steer and control its speed autonomously, started just last year, in 2014. The team was mostly based at Daimler Trucks North America's HQ in Portland, Oregon, with some extra hands in Germany. The company emphasises that the Freightliner Inspiration is a limited take on autonomy. The system will kick in only once the truck's on the highway and up to speed, and then it will maintain a safe distance from other vehicles and stay in its lane. It won't change lanes to pass slower vehicles on its own. If the truck encounters a situation it can't

confidently handle, like heavy snow or faded lane lines, it will alert the human that it's time for him to take over. The mechanical side of the project was relatively straightforward, again largely because the company's done so much of this work before. The sensors Daimler uses on passenger cars with autonomous driving, for example, are perfectly suitable for trucks.

Ms. Pfeifle explains that the main challenge of autonomous driving is ensuring that all functional safety requirements are met. For the Inspiration, this meant ensuring the collection of redundant data from

several different sensor technologies (sensor data fusion) in order to enable safe autonomous driving in complex scenarios as well. Interesting in that regard is that while the general public may equate autonomous driving with a futuristic world, Daimler actually stresses the more mundane and practical benefits of the technology. Ms. Pfeifle stresses that road safety is increased by the intelligent networking of the assistance systems, and that fuel consumption is reduced due to more uniform traffic flow and powertrain optimization. Other benefits in her view include that vehicle component strain is reduced as a result of the more





uniform traffic flow, while maintenance and repair costs are reduced due to connectivity allowing for anticipatory diagnostics and software updates.

She also lists benefits for drivers, including a reduction of stress in monotonous driving situations, and more time freed up to take over dispatching tasks while on the road. Right now, a truck driver in the US can stay on the road for only 11 hours after 10 consecutive hours off duty. That's a major issue when considering the major shortage of truck drivers in the US right now. In a recent survey by the American Transportation Research Institute, US carriers listed hours-of-service rules as their top concern. If Daimler can guarantee drivers are less tired when using its autonomous system, regulators might be willing to ease those rules.

The company elected to debut the Freightliner Inspiration Truck in Nevada, not in spite of, but rather because of the fact that Nevada has regulatory requirements for gaining a license to test autonomous vehicles on public roadways in the state. To earn the autonomous vehicle license plate from Nevada, Daimler needed to prove the system could safely cover 10,000 miles on its own. The team spun the

odometer using two of the trucks, plus a testing mule (a non-fancy version with the same tech), on a test track in Germany and in Nevada. "We not only wanted to show what was technologically possible, we wanted to do it in a regulatory environment that set safety and other standards concerning vehicle testing and driver training," says Ms. Pfeifle. "We worked closely with the Nevada Department of Motor Vehicles to understand and comply with the state standards."

Ms. Pfeifle is cautiously optimistic when she describes her views on the potential market for self-driving trucks. "Consumers are being exposed to the advantages of AV technology in the cars they drive and we expect that they will not only accept, but start to demand, some of the safety features in commercial trucks. The fact is that some of the Level 1 and Level 2 AV technology is already deployed in thousands of Class 8 trucks on the road today. Ultimately, a number of factors will be at play determining when autonomous vehicle technology for commercial trucks will achieve market acceptance. Government regulations will need to set guidelines for the technology. The availability of proven autonomous vehicle systems at a cost that makes sense to trucking

companies will be an important factor. And autonomous vehicles will need to gain social acceptance with fleets and owner-operators. We believe the demonstration of the Freightliner Inspiration Truck is a major step in starting the conversation about the advantages of autonomous vehicles for moving freight."



Daimler AG  
HPC G162,  
70546 Stuttgart  
Germany  
Website: [www.daimler.com](http://www.daimler.com)