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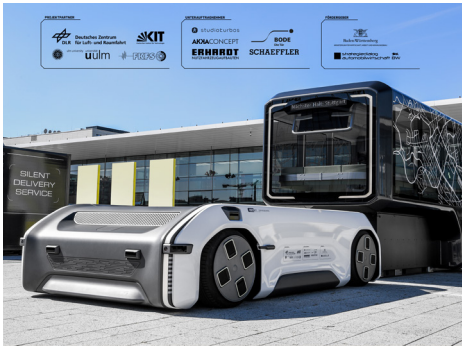
U-Shift

Modular design: Driveboard combined with capsule



Brief description

A wide variety of capsules for transporting people or goods can be flexibly combined as required with a drive unit, the 'Driveboard'. Capsule replacement is quick and easy, as Driveboard and capsule couplings do not require any operating personnel or special infrastructure.

Aims

The first step was to build a rolling prototype of the U-Shift to make the vehicle visible and tangible. In further phases, demonstrators with extended functions and innovative technology modules, with automation and electrification, for example, will be developed. The deployment of a test fleet in a real laboratory is also envisaged.

Parties involved

DLR Institute of Vehicle Concepts, Research Institute of Automotive Engineering and Vehicle Engines Stuttgart, Karlsruhe Institute of Technology (FAST & ITIV), Universität Ulm (MRM)

Applications

Around U-Shift there is a large project landscape with questions: Automation, chassis, powertrain, vehicle structure, electrical/ electronic architecture, public participation, vehicle operating concepts, mobility as a service.

Outlook

Research in the U-Shift project landscape aims to develop exciting vehicles that anticipate trends, technologies and development methods of future vehicles. Goals: Climate protection, mobility, more safety for all road users, comfort, organisation of the transformation of the entire transport system.

Facts and Figures

Driveboard and passenger capsule ÖPNV: 5,6 m x 2,2 m x 3,2 m (LxWxH)
Passenger capsule ÖPNV: 7 seats, 3 standing places, wheelchair/pushchair space, barrier-free access
Cargo capsule M4: Space for 4 Euro pallets or mesh trolleys
Financing: Baden-Württemberg Ministry of Economics as part of the Automotive Industry Strategy Dialogue of 12 million € and federal government 4 million €.

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Whether as an on-demand shuttle, a high-tech call bus, flexible distribution centre for goods and parcels, or mobile sales outlet – with the futuristic U-Shift vehicle concept, DLR and its various research partners are bringing a breath of fresh air to urban mobility and logistics of tomorrow.

The central feature of the approach is the separation of the vehicle, called the Driveboard, and the capsule-shaped superstructures for passenger or freight transport. The U-shaped drive unit includes many cost-intensive technical components and systems in order to be automated, electric-powered and quiet when travelling. For good cost efficiency, the Driveboard is in operation around the clock if possible. The capsules can be manufactured in large or small quantities for a variety of applications.

The U-Shift prototype with Driveboard and passenger capsule for public transport has dimensions of approx. 5.6 m x 2.2 m x 3.2 m (LxWxH). The Driveboard currently runs under remote control and will be completely automated in the future, where different concepts of automation are being researched. Here, too, safety is a central aspect of development. The passenger capsule is equipped with seven seats and one folding seat. Barrier-free access is provided by a large door with integrated ramp, as well as wheelchair or pushchair space. This area can also be used for standing room. In the M4 version, the cargo capsule offers space for four Euro pallets or eight roller containers.
The prototype is being used to gain initial experience with the system, such as loading, picking up and setting down capsules. The development of the U-Shift included close contact with potential producers as well as operators. At the same time, intensive discussions are being held with the public to discuss needs and desires for U-Shift deployment scenarios and associated future jobs.
Different projects with various questions and diverse partners are being researched in the project landscape of the U-Shift. In the next major step, for example, the performance of the powertrain is being increased, hardware and sensors for automated and connected driving is being installed, a new battery system is being tested, and the chassis and lift system is being further developed. Furthermore, the deployment of a test fleet in a real laboratory is envisaged.

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Deutsches Zentrum für Luft- und Raumfahrt (DLR)
(German Aerospace Center, DLR)
Prof. Tjark Siefkes · E-Mail: Tjark.Siefkes@dlr.de
Dr. Marco Münster · E-Mail: Marco.Muenster@dlr.de
Mascha Brost · E-Mail: Mascha.Brost@dlr.de