



Mobility as a Mindshift.

Berlin, September 2026

Press Release

MONOCAB System: TH OWL develops autonomous monorail system for the mobility of tomorrow

Second generation of vehicles celebrates its international premiere at InnoTrans 2026 in Berlin

Since 2020, a consortium of partners from academia, industry and other fields, led by the OWL University of Applied Sciences and Arts (TH OWL), has been jointly developing the **MONOCAB System**. At its core is the development of an autonomous, gyroscopically stabilised passenger vehicle that runs on a single rail. This combination of monorail guidance and active gyroscopic stabilisation distinguishes MONOCAB from comparable European and international concepts for small autonomous rail vehicles.

The vehicle is designed as a lightweight, demand-responsive passenger transport system. It can be deployed both on existing disused railway infrastructure and on newly constructed monorail lines - for example, to reactivate rural railway lines or to provide new short-distance connections on university campuses, in cities and on industrial sites.

From idea to demonstrator

The concept originated in the MonoCab OWL project, as part of which two full-scale demonstrator vehicles were built and tested. Since 2020, the **MONOCAB System** has been continuously developed by a consortium led by TH OWL. This has demonstrated the fundamental technological feasibility of the concept. The project has also attracted considerable public interest and achieved a high level of acceptance.

In 2025, MONOCAB received the RegioStars Award for regional innovation. The project had previously been presented on international stages, including Hannover Messe 2023, the Smart City Expo World Congress in Barcelona in 2024 and the UITP Summit in Hamburg in 2025.

Four projects, one goal

Building on the demonstrators, TH OWL and its project partners are currently working on four interconnected projects:

MONOCAB ST is developing key subsystems: the vertical stabilisation system based on a dual-gyroscope arrangement, a safety-related control architecture, the running gear including a MONOCAB-specific switch design - for which a patent application is in preparation - as well as systems for positioning and obstacle detection.

MONOCAB ready is developing the second generation of ATO-capable full-scale test vehicles as well as the necessary infrastructure, for example for track changes and stops, and is assessing the economic viability of potential operating models.

enableATO is field-testing automated rail operation at Grade of Automation 4 (GoA 4). The project is being carried out by a larger consortium of universities and industry partners, with MONOCAB serving as one of several use cases.

Campusbahn ICL is constructing a 300-metre demonstration track on the university campus in Lemgo featuring an innovative, cost-effective monorail infrastructure - serving as a model for future routes on university campuses, in cities and on industrial sites. An initial 30-metre test track has already been evaluated, and construction of the 300-metre track is underway.

In addition, the **KAMOS** project focuses on cooperative, automated and connected mobility on road and rail. A research test field is being created on the Lemgo campus, combining a real-world test environment - the campus railway operating in shared traffic space with cars, cyclists and pedestrians - with a digital mobility laboratory in which complex traffic scenarios are first simulated.

Current development status

Two second-generation test vehicles are currently under construction, with a Technology Readiness Level (TRL) of 5 to 6. Compared with the first generation, they feature a functional safety concept for the stabilisation system, a new drive system providing greater ride comfort and allowing curve radii of down to 25 metres, prototype autonomous driving technology, as well as passenger-oriented functions such as a cabin with an automatic door, test ride booking and interior monitoring.

The first of these vehicles will be presented at InnoTrans in Berlin from 22 to 25 September 2026 (Hall 2.2, Stand 155). Test operation is scheduled to begin in November 2026.

In parallel, the automated driving system is being tested on the existing MONOCAB vehicles on a disused railway line in Extertal.

The following functions have already been demonstrated:

- **autonomous driving along a defined route,**
- **connectivity with a remote control centre,**
- **GNSS/IMU-based localisation using a locally surveyed route map,**
- **camera- and LiDAR-based detection of obstacles and people, with reliable braking,**
- **autonomous, demand-responsive passenger transport with automatic boarding and alighting at defined stops..**

The next steps include improving control on gradients, optimising person detection in the alighting area and extending mobile data connectivity for longer test runs..

Potential applications

Beyond its current test operations, MONOCAB is intended for a wide range of applications: reactivating disused railway lines, campus and urban transport, mixed operation with conventional rail vehicles, use on industrial and factory sites, as well as freight transport.

An initial study identifies well over 10,000 kilometres of disused but still legally designated railway infrastructure in Germany, Poland and France alone that could potentially be reactivated using MONOCAB.

Outlook

The MONOCAB project team and its partners are pursuing several avenues for further development: research into variants and extensions of the MONOCAB concept for additional applications and markets; specific MONOCAB application studies for individual use cases - such as railway line reactivation, campus transport, industrial sites or freight transport - as well as the establishment of a spin-off to bring MONOCAB and its underlying technologies into further markets.

The development roadmap envisages reaching Technology Readiness Level 8/9 no earlier than 2030/2031.

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