

# THE MONOCAB PROJECT

**The Idea.** MONOCABs are gyro-stabilized vehicles that balance on just one rail of a standard train track. They are so compact and narrow that they can pass by each other in opposite directions. Each cabin can accommodate four to six passengers. Many of these autonomous, selfdriving cabins will operate simultaneously in both directions on a single track and can be ordered like taxis for individual trips to villages or cities – via app, 24 / 7, 365 days a year.

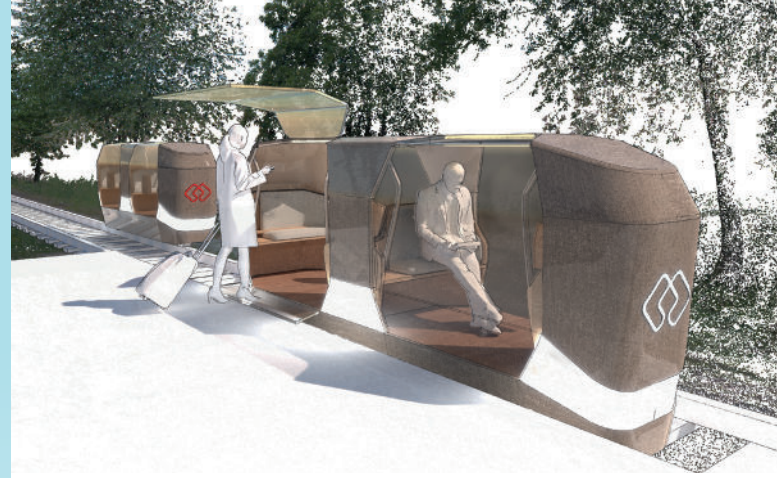
## The Goal: Connecting Rural Areas to Regional Centers.

The MONOCAB project has two primary objectives. First, it aims to become a central means of transportation for the future of sustainable mobility in rural regions: a public yet individualized rail system that creates equal living conditions between urban and rural areas. Think of it as Individual Public Transportation, an expansion of traditional public transport and a supplement to the car-making people in rural areas more mobile and independent.

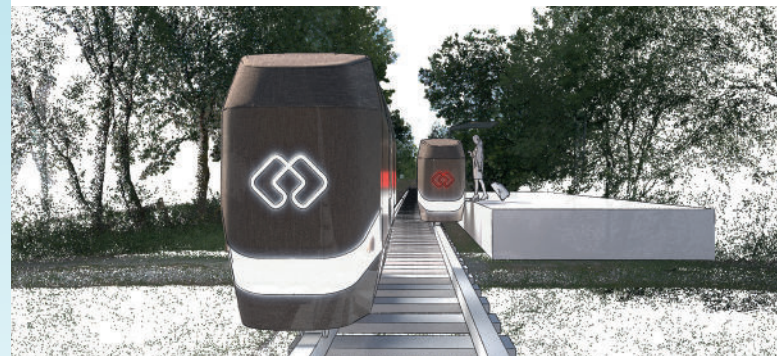
Second, it aims to strengthen North Rhine-Westphalia in Germany and the „Nordlippe“ region as centers of innovation. Where there’s a will, there’s away: Nordlippe will become a living lab, leading the way! To ensure rural areas don’t lose connection, they must stay mobile: for better quality of life and more economic growth – fully in line with the regional innovation strategy „Connected Mobility and Logistics“ of North Rhine-Westphalia (2021-2027). Innovative technologies for the future of mobility should be researched, developed, produced, and applied early in North Rhine-Westphalia, making transportation cleaner, safer, and better.

This will further strengthen the industrial location of North Rhine-Westphalia – not only as a sustainable innovation driver but also as a revitalizer of rural areas. This political strategy for mobility aims to bring about a better quality of life in rural areas through the development of MONOCAB to market readiness. It represents a transformation toward future mobility via individualized public transportation, as well as enhancing the region’s capacity for research and innovation.

The vision for a good life in the countryside is within reach: not only more individualized mobility but also regional development for equal living conditions in rural areas. The project shows how old, seemingly unprofitable single-track railways can improve rural mobility through demand-oriented and autonomous vehicle concepts. If no trains travel to the countryside anymore, MONOCABs will!



Renderings: [ TH OWL 2021 © © Design Team Monocab: Prof. Ulrich Nether, Prof. Hans Sachs, Carolina Meirelles, Maximilian Müh]



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RESEARCH PARTNERS

Funding is provided as part of several projects and includes funds from the German Federal Ministry for Digital and Transport, the European Regional Development Fund (ERDF) programme and the Ministry for the Environment, Nature Conservation and Transport of the State of North Rhine-Westphalia.

Welcome to the UrbanLand of North Rine-Westphalia.  
MONOCAB – flexible and individual mobility solution: made and tested in North Rine-Westphalia Let’s dare to think ahead !

**The Participants.** The MONOCAB initiative includes several funded projects. The core research partners consist of the Ostwestfalen-Lippe University of Applied Sciences, Bielefeld University, and Fraunhofer IOSB-INA. Numerous corporate and municipal partners support the project.

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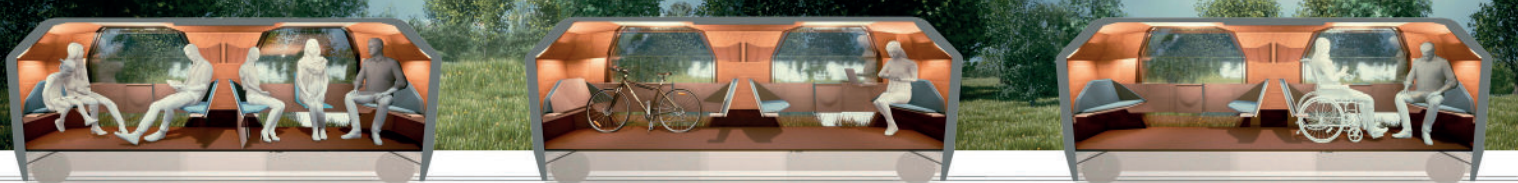
## The visionary monorail for next-generation mobility

Flexible and individual mobility solution: made and tested in North Rine-Westphalia



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With a total funding exceeding 20 million euros across multiple projects, various funding programmes are involved including the German Federal Ministry for Digital and Transport, the European Regional Development Fund (ERDF) and the state of North Rhine-Westphalia.



MONOCAB is funded by:



Kofinanziert von der Europäischen Union



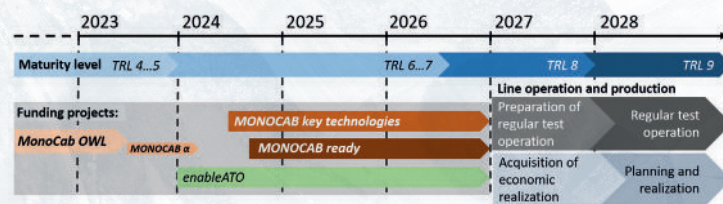


## FIRST TEST TRACK

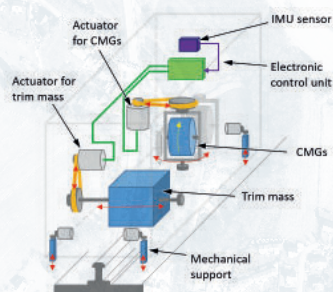
The project uses the existing infrastructure: First test fields have been set up on the disused section of the Extertal railway – with the aim of carrying out tests and demonstrations under real conditions.



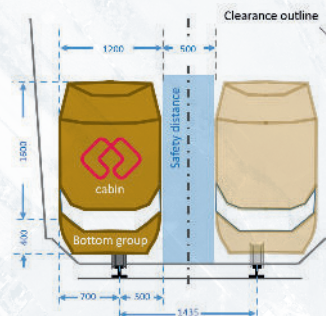
## ROAD MAP



## STABILISATION



## VEHICLE CROSS-SECTION



**The state of the art.** In 2022, the project has reached the test setup in an operational environment: the results of two years of research and development show the ready-to-drive technical demonstrator on a disused section of the Extertal railway and a design mock-up of the MONOCAB. The first demonstrators are not yet prototypes, but real-size monorail vehicles that are ready to drive and have all the basic technical functions and safety features for test purposes. The existing infrastructure is used for this purpose which ideally reflects all the legal and operational constraints of a rural railway in a confined space.

**The milestones.** The development of the test vehicle is currently being continued through to the prototype stage. The milestones for this are nine technology readiness level (TRL). The project has currently reached TRL 4: „Test setup in a laboratory-like environment“. In the currently ongoing funding projects, new second-generation test vehicles with a TRL 6 will be created by 2027: „Demonstration in a relevant operational environment“. Subsequently, the aim is to bring the system to series maturity by 2029 with private-sector investors and start the first regular operations with MONOCABs (TRL 9: Successful use of the qualified system).

**The test field.** In the project, the necessary sections of track are being prepared as test fields. A section of the Extertal railway that is currently being decommissioned was selected as a test field and can be tested in close cooperation with and with the support of the line owner VBE. General conditions can be modelled and tested here on a 1:1 scale.

**Fields of application.** The motivation for this innovative vehicle concept comes from the reactivation of disused lines in rural areas. In particular, the utilisation of existing infrastructure is the core idea behind the project. Other fields of application are also conceivable: Within institutional settings, such as university campuses or large corporate grounds, the MONOCAB offers a cost-effective and practical transportation solution. In urban and suburban regions, the MONOCAB can be used for inner-city traffic. In these cases only a single rail in combination with a ring route is required. This approach is a space-efficient solution minimizes the need for extensive infrastructure investments. The MONOCAB can fit into narrower spaces and existing areas more easily, thereby optimizing land use and preserving valuable space. The MONOCAB can be adapted for cargo transport by replacing the passenger cabin with a dedicated cargo module. This modification is interesting in combination with the above-mentioned use case for institutional settings. Last but not least, the MONOCAB could be utilized or adapted for specialized applications such as event transport and tourism.

„Let's dare to think ahead!“



MONOCAB