



PODS4RAIL

Annual Activity Report 2025



Annual Activities in 2025

General

The Pods4Rail project aims to achieve the vision of a rail based fully automated supermodel mobility system for passengers and goods, which is standardised, scalable and suitable for all transportation modes, as set out in ERRAC's "Rail Strategic Research and Innovation Agenda" of December 2020. The project Pods4Rail, which started in September 2023 with 15 partners from 7 EU countries.

The concept of carriers as "moving infrastructure" being in use most of the time can also help to reduce the number of vehicles and increase the efficiency of the railway system with the objective to make operation more cost-effective and efficient on the one hand through autonomous, lighter vehicles. The challenge for the project lies in developing the appropriate solutions and in addressing the new needs in existing transport regulations. Different use cases for passenger and freight services are addressed considering individual and collective transport.

Unfortunately, as the year progressed, it became apparent that the original timeline for the individual work packages to be completed this year was too optimistic, necessitating a postponement of the completion dates.

1

Continuous work in the work packages

An important milestone of the project, WP 6 "Economical and Technical Evaluation of Operational Procedures," could not yet be satisfactorily completed. It became clear that the original requirements and the achievable results were insufficient to produce a satisfactory analysis. Therefore, the project decided to redefine the work package and address it more effectively within the framework of a requested project extension in an amendment of the project.

Based on the use cases defined in D4.1 in 2024, the "Design Concepts for Different Use cases" were derived and elaborated in WP 8. The extensive work, which included a discussion of the possible materials to be used, design methods, design features and joining technologies, shows in detail the path from the idea to the conceptual design and the identification of the design variants, shown in D8.1. As a further important step, the "Detailed Concept of a Sample Vessel for one Use Case" was developed in WP 9, and a comprehensive presentation of the possible designs and design options was included in D9.1.



Alongside this and characterised by a constant exchange with WP 8 and 9, was the work that began in parallel in WP 10 and includes the "Concept Development for Equipment of Sample Vessel". Within this work package, which built upon the fundamental work from D7.1 "Concept Proposal (System)," concept proposals are being developed for the power supply of the equipment and the and packaging of the Transport Units (TU), for the air conditioning of the passenger TU, for localisation, and for communication. Despite some delays, the work is largely complete, and completion is expected as planned in 2026.

Also, the work on WP 11 for the "Concept Development for Traffic Coordination of Pods System" began in 2025. This phase is intended to develop the system requirement specification, the design concepts for information and communication, and the traffic coordination concept for the pod system, culminating in prototyping and validation. Here, too, delays had to be overcome to achieve a high-quality result.

Another essential step was the "Defining and Developing the Concept for the Coupling System" of the planned new system in WP 12. Through the work of the participating project partners from the railway sector and the universities, the necessary technology

was evaluated and derived. Of note are the contributions made during a student workshop, which provided further insights into the topic.

In addition, work began in 2025 on WP 13 "Concept for the Handling, Loading/Unloading Technologies" and on WP 14 "Development of a "Moving Infrastructure" Carrier for Rail, Road and Ropeway", which unfortunately were affected by the high personnel workload in the previous work packages and whose completion will therefore unfortunately be delayed until the middle of 2026.

Public Relations Activities

The project's public Mid-Term Event took place on February 4, 2025. The interim report presented by the project partners, at a public event with representatives from the railway sector and other interested parties from various industrial and research fields at the University of West Bohemia in Pilsen, revealed significant interest in the concept as well as further potential applications. A brief report on the event was published in the "ETR – Eisenbahntechnische Rundschau" in May 2025 in the German edition.

Furthermore, project partners gave presentations in June 2025 at the "International Conference on Transportation Systems" (TS2025), in September 2025 at the "Graz Smart Vehicle Forum" and at the "SmartRaCon" in Stuttgart, and in November 2025 at the "World Congress on Railway Research" (WCRR 2025).

Additionally, one articles about "Pods for Healthcare" was published in September 2025 in the German edition of the in "ETR – Eisenbahntechnische Rundschau".