

Deliverable D 14.2

Scaled model (1:11 or 1:22.5) of a rail carrier application

Project acronym:	Pods4Rail
Starting date:	2023-09-01
Duration (in months):	34
Call (part) identifier:	HORIZON-ER-JU-2022-01
Grant agreement no:	101121853
Due date of deliverable:	28.02.2026
Actual submission date:	29.06.2026
Code:	Pods4Rail-WP14-D-SMO-AT-002-1
Responsible/Author:	SMO-AT / Walter Struckl
Dissemination level:	PU
Status:	I

Reviewed: yes

Reviewer: SMO

Document history		
<i>Revision</i>	<i>Date</i>	<i>Description</i>
1	29.06.2026	Final Version

Report contributors		
Name	Beneficiary Short Name	Details of contribution
Walter Struckl	SMO-AT	Preparation of overall Document; discussion of scaled model
Manuel Osebek	DLR	Discussion of scaled model
Nicolai Schmauder	DLR	Discussion of scaled model
Kenny Lukas	DLR	Discussion of scaled model
Maria Traunmüller	MID	Discussion of scaled model, Development design model, Production of design model
Karel Raz	UWB	Discussion of scaled model, Development design model, Production of design model
Martin Stejskal	UWB	Discussion of scaled model, Development design model, Production of design model
Roman Cermak	UWB	Discussion of scaled model, Development design model, Production of design model
Jiri Korinek	UWB	Discussion of scaled model, Development design model, Production of design model
Jesus Felez	UPM	Discussion of scaled model
Dirk Winkler	SMO	Discussion of scaled model; general review of overall document

Disclaimer

The information in this document is provided “as is”, and no guarantee or warranty is given that the information is fit for any particular purpose. The content of this document reflects only the author’s view – the Joint Undertaking is not responsible for any use that may be made of the information it contains. The users use the information at their sole risk and liability.

The content of this deliverable does not reflect the official opinion of the Europe’s Rail Joint Undertaking (EU-Rail JU). Responsibility for the information and views expressed in the deliverable lies entirely with the author(s).

Table of Contents

1	Executive Summary	1
2	Objective/Aim	1
3	Scaled model of the Rail Carrier Unit concept.....	2
3.1	Virtual model: “Technical Model”	2
3.2	Virtual model: “Design Model”	3
3.3	Physical model production.....	3
3.4	Final version of the physical model.....	4
4	Conclusions	5

1 Executive Summary

The present document constitutes the documentation of the Deliverable D 14.2 “Scaled model (1:11 or 1:22.5) of a rail carrier application” in the framework of the Flagship Area 7, project Pods4Rail as described in the EU-RAIL Multi-Annual Work Plan. The Deliverable D14.2 within Work Package (WP) 14 is very much related to D14.3 “Scaled model (1:11 or 1:22.5) of a road carrier application”.

This Deliverable will provide a scaled model (1:22.5) to demonstrate the packaging concept, the mechanical architecture, and aspects of the drive train as well as the chassis and exterior concepts for rail applications. Within the Pods4Rail project, the task 14.2 builds the input of the concept development of a Carrier Unit (CU) for rail transport, including relevant system elements.

The methodology of this task includes to adapt the Computer Aided Design (CAD) models developed in Task 14.2 within work package 14 and simplify it to a showcase model that symbolises the most relevant concept details in a scaled model. Also, it was considered to reach a high level of streamlined design approaches for the overall system across several transport domains.

The outcome of this task is a visible and touchable scaled model of the Rail Carrier Unit concept. Together with the scaled model of the Road Carrier Unit concept (D14.3) the idea of the pod system from the Pods4Rail project can be demonstrated.

Limitations of this task are, that a scaled model is always showing a reduced complexity and it is not able to demonstrate the whole pod system and vehicle functionalities.

2 Objective/Aim

This document has been prepared to provide a short documentation about the scaled model demonstrator of the Rail Carrier Unit.

The scaled model is designed to showcase the following highlights and functionalities:

- Change between long and short vehicle configurations (10/15/25 feet capacity)
- Change between Passenger Transport Units (TU) and ISO-Container for different load configurations
- Change TU between Road, Rail and Ropeway CU
- Exterior Design detachable to see the components under the skin
- Technical model of relevant subsystems (e.g. structure, chassis etc.)

3 Scaled model of the Rail Carrier Unit concept

3.1 Virtual model: “Technical Model”

The “Technical Model” consists of detachable components. The model contains:

- Structure of the vehicle body
- Bogie with wheelsets and suspension
- Drivetrain with batteries and engines
- Interfaces with mechanical and electrical coupling
- Entry systems with electrical stairs
- Exterior skin with front/rear and loading area covers
- Transport Units 10 feet and 5 feet

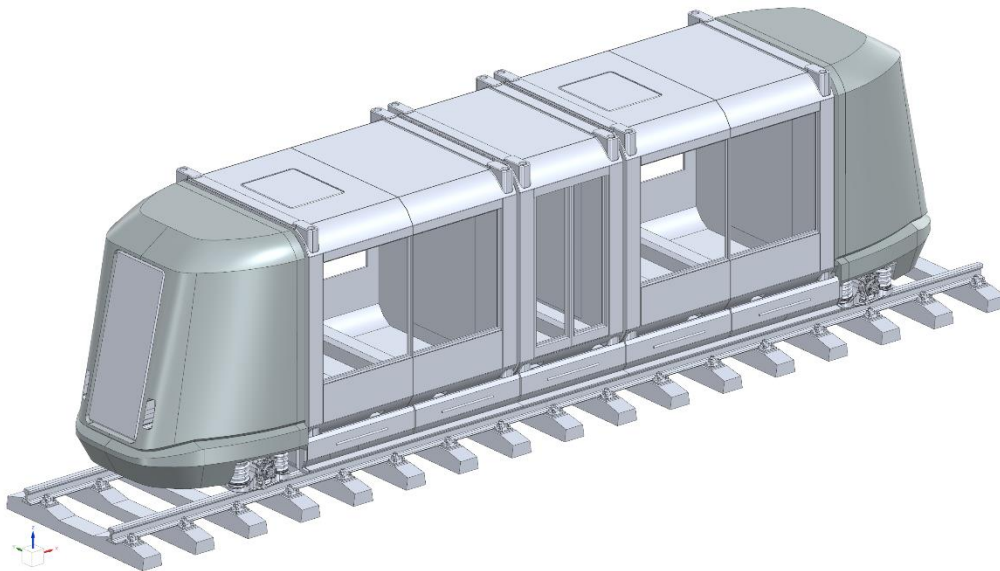


Figure 1: CAD of scaled model with exterior skin (Source: UWB)

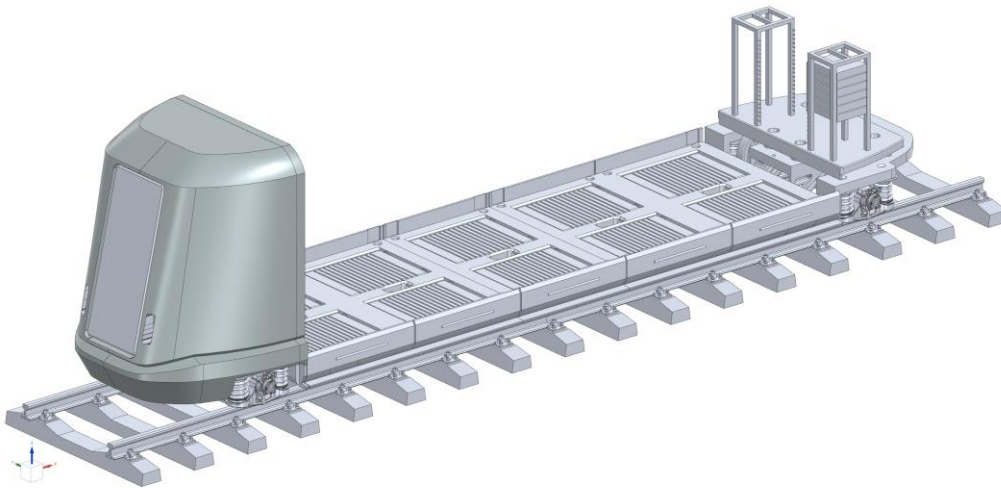


Figure 2: CAD of scaled model with detached exterior skin (Source: UWB)

3.2 Virtual model: “Design Model”

One version in scale 1:22.5 was developed by moodley, to show the exterior design concept principles of the Rail Carrier Unit and the Transport Units.

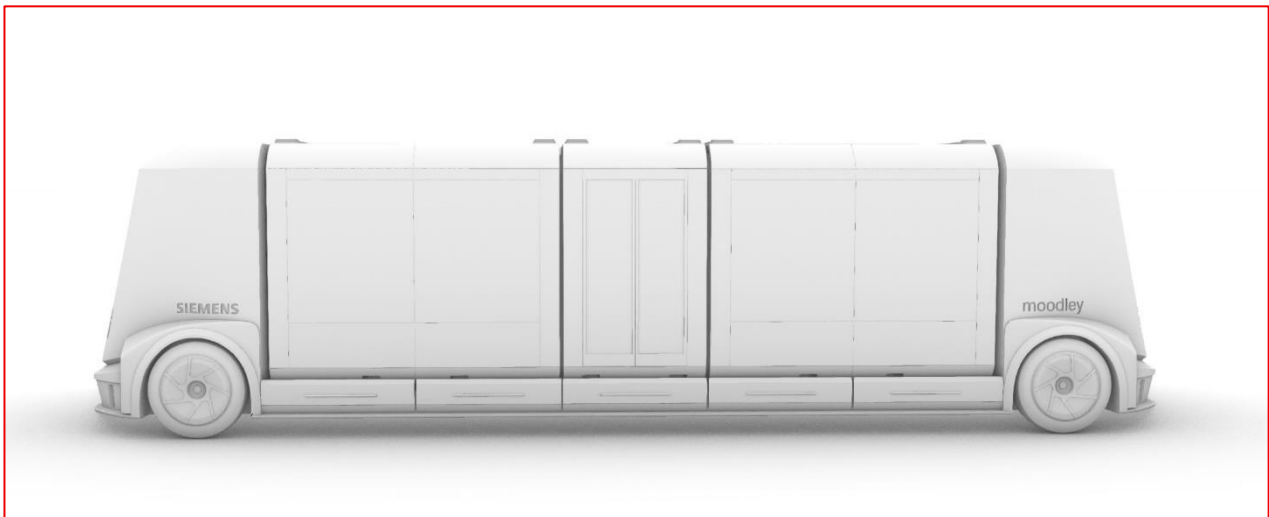


Figure 3: CAD of scaled model “Design model” (Source: moodley)

3.3 Physical model production

The physical model was built by UWB in several segments and stages. Relevant concept details had to be developed, that functionality and compatibility towards the Road Carrier Unit can be reached.

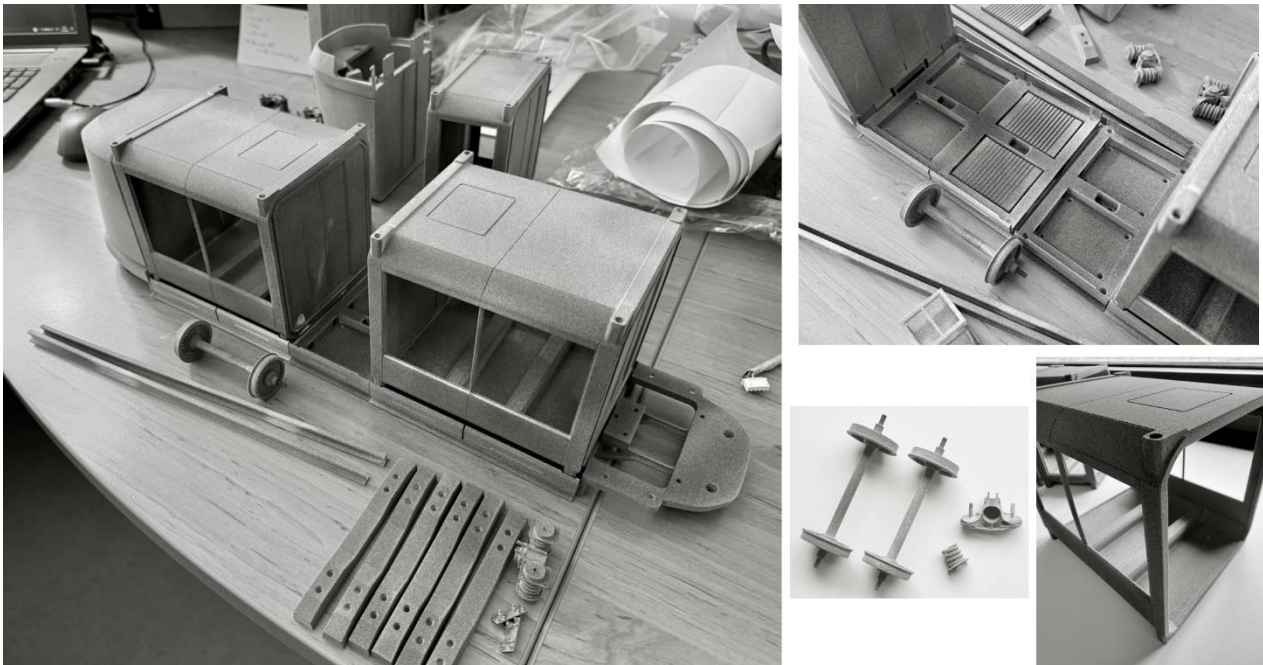


Figure 4: D14.2 Rail CU model production of test parts with simplified coupling system – Status of 15.06.2026 (Source: UWB)

3.4 Final version of the physical model

The physical model of the Rail Carrier Unit and the Transport Units is shown in Figure 5. The technical specification is as follows:

- Dimensions: Approx. 500 x 120 x 150 mm (length x width x height)
- Weight: approx. 1 kg
- Number of parts: approx. 110

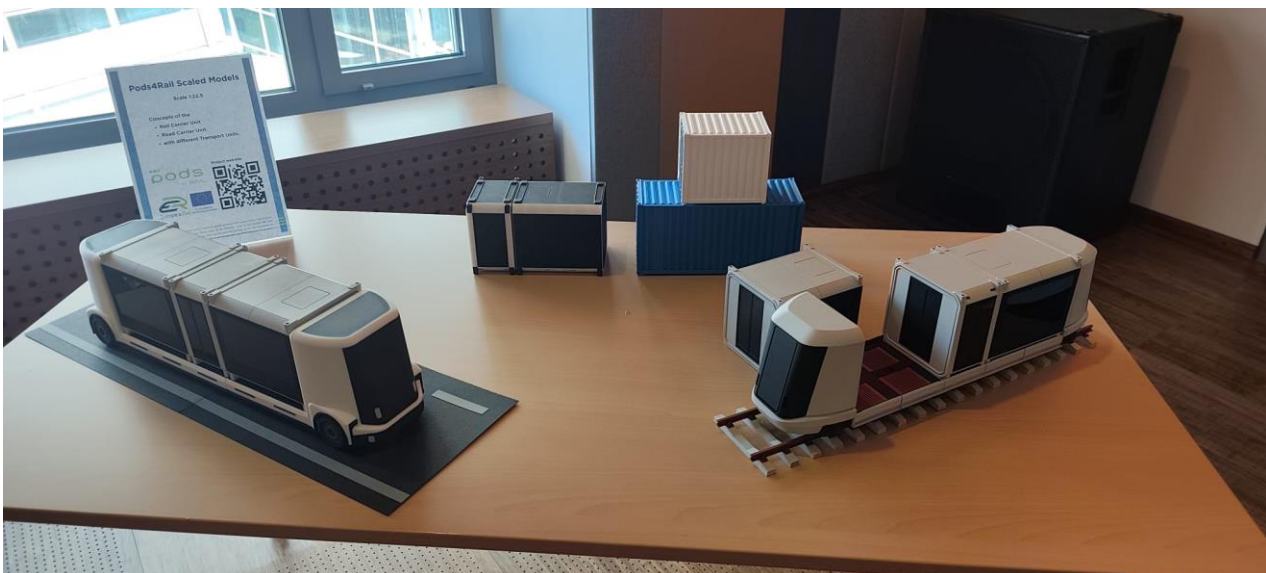




Figure 5: Physical model of the Rail Carrier Unit (right) and the Transport Units next to the Road Carrier Unit (left) at the Pods4Rail Final Event in Vienna (Source: UWB, DLR)

4 Conclusions

This deliverable presents the virtual and physical scaled model of a Rail Carrier Unit concept from Pods4Rail WP14. The scaled model is equipped with key functions to showcase the system design and the flexibility of the concept. It is able to interact with the overall pod system and its key elements, if they will be produced as a scaled model as well (e.g. Handling System, Transshipment Stations, Ropeway Carrier Unit, etc.).

List of Figures

Figure 1: CAD of scaled model with exterior skin (Source: UWB).....	2
Figure 2: CAD of scaled model with detached exterior skin (Source: UWB)	3
Figure 3: CAD of scaled model “Design model” (Source: moodley).....	3
Figure 4: D14.2 Rail CU model production of test parts with simplified coupling system – Status of 15.06.2026 (Source: UWB).....	4
Figure 5: Physical model of the Rail Carrier Unit (right) and the Transport Units next to the Road Carrier Unit (left) at the Pods4Rail Final Event in Vienna (Source: UWB, DLR)	5