

CHALLENGES AND CONCEPT APPROACH OF INTERFACES FOR INTEROPERABLE TRANSPORT UNITS FOR SEAMLESS TRANSPORT SERVICES

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Summary: Today's cities are confronted with major challenges in the transport sector. Increased demands for freight transport and the need of efficient public transport services especially on the urban road and rail sector are often resulting in traffic jams, pollution and inconvenient travel journeys. To adapt the transport sector to current challenges, high investments are needed for example for utilising existing infrastructure for increased transport volumes and higher number of vehicles or to fill the gap of missing personnel in every part of the transport sector. In addition, due to end customers wishes to personalize their travels and enjoy comfort during their rides, new approaches are needed to motivate citizens to use public transport offers.

The solution that utilises this potential would be a system that goes beyond mere intermodality and creates a concept of seamless transportation with different means of transport without a direct transfer of the passengers or goods. This concept consists of a pod system of standardised transport units, compatible with different powered carrier vehicles. This would enable a seamless transition of the transport unit and its payload between road, rail and air transport, shipping or cable cars. The inclusion of various transport systems in particular offers great potential that currently remains untapped by many visions for new means of transport. The EU-funded research project Pods4Rail (part of Europe's Rail Joint Undertaking (HORIZON-ER-JU-2022-FA6-01)), aims to lay the foundations for the realisation of such a pod system.

One main challenge of such a new system is to create interfaces between the transport units and different carrier units for rail, road and cable car as well as towards other system elements e.g. a handling system or a crane that are needed for seamless transfer. This paper introduces the new pod system and what interfaces have to be technically necessary and considered. It specifically focusses on the concept approach of how the mechanical locking interfaces of intermodal transport units can look like by applying existing standards to new technologies. The paper discusses advantages and challenges of the interface design in the frame of given functional requirements and specifications for the transport unit handling. By using this pod system with the rail infrastructure as a backbone for the seamless transport, a new possibility for efficient, sustainable, comfortable and safe mobility of people and goods could be achieved.