



Project Members

X2RAIL 1

Project Coordinator: **SIEMENS**



Start-up activities for Advanced Signalling and Automation Systems

Contact us

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Project Website

<https://projects.shift2rail.org/X2RAIL-1>



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PROJECT OVERVIEW

We need a competitive and resource-efficient European railway system. Shift2Rail works hard to bring this vision to life. Hence, its activities are focused on these three top level objectives:

- Support of the creation of the Single European Railway Area (SERA).
- Enhance the attractiveness and competitiveness of the European railway system.
- Help the European rail industry to retain and consolidate its leadership on the global market.

The expected outcomes of the Shift2Rail activities aim to improve services and customer quality, increase capacity, increase reliability, reduce lifecycle costs, enhance interoperability and simplify business processes for all four rail market segments: high-speed and intercity passenger rail, regional passenger rail, urban/suburban passenger rail and rail freight.

The Shift2Rail Innovation Programme 2 (IP2) focuses on control, command, signalling and communication systems and tackles the aforementioned Shift2Rail objectives. Thus, the overall IP2 challenge is to increase functionalities of the existing signalling and automation systems and related design and validation processes providing a more competitive, flexible, real-time, intelligent traffic management and decision support system, whilst addressing all four market segments and maintaining backward compatibility to the existing European Rail Traffic Management System (ERTMS) and especially its European Train Control System (ETCS) component.

X2RAIL 1

X2RAIL-1 has addressed the first six out of eleven research and development work streams within the Shift2Rail IP2. These workstreams, also called Technical Demonstrators, are Adaptable Communication, ATO over ETCS, Moving Block, Zero on-site Testing, Smart radio-connected all-in-all Wayside Objects and Cyber Security. To make sure that all developments are in line and well coordinated, X2Rail-1 and each subsequent X2Rail project includes a specific "WP2", which looks at system coherence challenges and is the main body to discuss all technical interdependencies.

X2RAIL-1 IN A NUTSHELL



19 partners



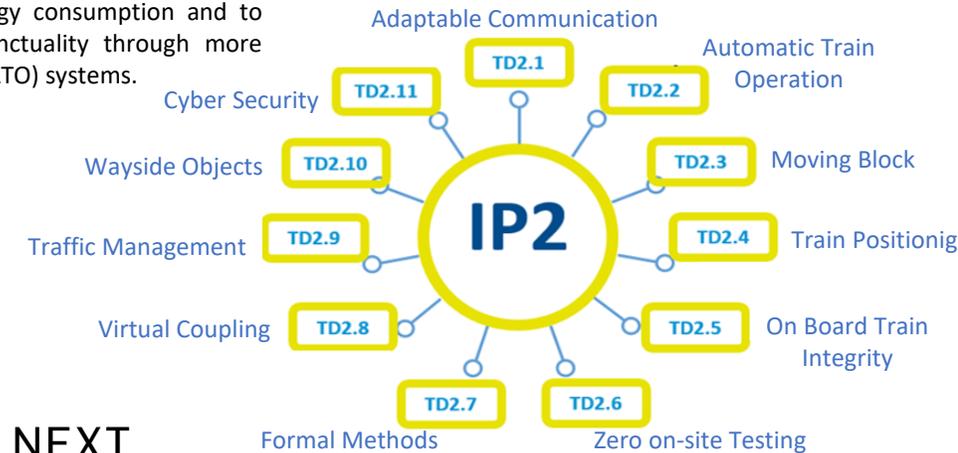
Budget of 45 M €



3 Years Duration

OBJECTIVES OF IP2

- To overcome the limitations of the existing communication system by adapting radio communication systems which establish the backbone for the next generation advanced rail automation systems.
- To improve the usable track capacity by introducing more Automatic Train Operation (ATO) systems and Moving Block systems.
- To innovate the signalling architecture towards a more modular and less cost intensive system by incorporating Moving Block systems and Smart radio-connected all-in-all Wayside Objects.
- To minimize energy consumption and to improve train punctuality through more extensive use of (ATO) systems.
- To increase innovation in the field of lab testing by developing architectures for new lab test systems and simulations for control, command, signalling and communication systems in order to reduce costs.
- To increase security among all connected signalling and control systems by developing new cyber security systems dedicated to railways.
- To ensure the backward compatibility of ERMTS/ETCS technologies, notwithstanding of the required functional enrichment of the future signalling and control systems.



WHAT'S NEXT

The remaining five Technical Demonstrators (Fail Safe Train Positioning, Onboard Train Integrity, Formal Methods, Traffic management Evolution and Virtual Coupling) were first dealt with in X2Rail-2 project. From the beginning, it was planned and foreseen that the eleven Technical Demonstrators are developed and researched within the five X2Rail-x projects. With X2Rail-1 finished, X2Rail-2 and X2Rail-3 in full swing, the X2Rail-4 proposal just submitted and the X2Rail-5 project in the early planning stage, we are on a very good path to reach the overall goals. With each project, the prototypes reach a higher technical readiness level (TRL) and bring the innovations closer to the market.