5G Corridor project– 5GiRa

5G GIGARAIL

The project in a nutshell

The 5GiRa study project focuses on the cross-border rail section between Arnhem (Netherlands) and Emmerich (Germany), part of the Amsterdam-Frankfurt section of the Trans-European Transport Network (TEN-T) North Sea-Rhine-Mediterranean rail corridor. This corridor holds significant potential for the deployment of the Future Rail Mobile Communication System (FRMCS) and the Gigabit Train concept, making it a key area of interest for advancing mobile connectivity for rail.

The primary objective of the 5GiRa project is to explore the potential of FRMCS and Gigabit Train technologies to enhance rail connectivity for both passengers and digital train operations. These advancements are critical enablers of carbon-neutral mobility and a competitive cross-border rail sector within the EU. The study represents a foundational step towards the deployment of FRMCS networks and improved passenger connectivity over the next decade, paving the way for smarter, greener, and more efficient rail transport solutions.

The project consortium is coordinated by ProRail, and consists of Royal KPN, Nokia Solutions and Networks, Ericsson Telecommunications, Vantage Towers, Alticom/Cellnex Telecom, Deutsche Bahn (DB) and Nederlandse Spoorwegen (NS).

Key facts

Length: 30 km

Corridor: Arnhem (Netherlands) – Emmerich (Germany), part of Amsterdam-Frankfurt section of the Trans-European Transport Network (TEN-T) North Sea-Rhine-Mediterranean rail corridor

Total EU grant: €851,354.00

Project duration: 6 months, December 2024 - June 2025

Transportation mode: Rail

Spectrum bands: RMR 1900 MHz, MNO bands 700 MHz and 3.5 GHz.

Service / Use cases:

- FRMCS use cases (e.g. ETCS, ATO and mission critical voice)
- Gigabit train passenger communications

What will it provide?

The 5GiRa study will deliver critical insights and frameworks to advance rail connectivity through FRMCS and Gigabit technologies. Specifically, it will:

- **Assess use cases** for FRMCS and Gigabit train technologies to identify their potential in enhancing rail operations and passenger connectivity.
- **Develop architectural concepts and cooperation models** for hybrid usage of public Mobile Network Operators (MNO) and private Railway Mobile Radio (RMR), ensuring seamless integration for FRMCS and Gigabit train applications.
- **Propose migration paths** from GSM-R to FRMCS, leveraging hybrid architectures to enable a cost-effective, timely, and efficient transition for rail operators.
- **Define essential steps** for the design and deployment of FRMCS, facilitating its verification and validation in alignment with the EU Rail Destination 2 initiative.
- **Lay the groundwork** for future implementation phases, including nationwide deployment of FRMCS and Gigabit train technologies.

How will the project unfold?

The 5GiRa project will progress through a series of carefully planned tasks to achieve its goals of advancing FRMCS architecture and enhancing rail connectivity:

1. **FRMCS Architecture and Interfacing**:
   The project will define the technical architecture and necessary interfaces for the seamless deployment of the Future Rail Mobile Communication System (FRMCS). This includes

establishing the foundational framework to support interoperability and efficient communication across borders.

2. **FRMCS and Gigabit Site and Radio Planning**:
   Comprehensive planning for FRMCS and Gigabit infrastructure deployment will be undertaken. This involves identifying optimal sites for radio equipment, ensuring coverage and capacity requirements are met, and preparing for integration with existing and future networks.
3. **Collaboration, Cost Modelling, and Cost-Benefit Analysis (CBA)**:
   Stakeholders will collaborate to develop a detailed cost model and conduct a cost-benefit analysis (CBA). This task will evaluate the financial and operational feasibility of deploying FRMCS and Gigabit train solutions, ensuring that the project delivers maximum value for investments made.

By addressing these tasks, the 5GiRa project will lay the groundwork for the next generation of rail communication systems, enabling cost-effective and future-proof solutions for rail operations and passenger services.

How is it financed?

The project is funded by EU/CEF Digital Grant programme.

Total EU Contribution: €851,354.00

More information

EU Funding & Tenders Portal

About

The ambition of the GUIDE project is to bring together the relevant stakeholders from the ecosystem of 5G Corridors across the European Union (EU) and to help them get the maximum value from the CEF Digital programme, ensuring that future CEF Digital work programmes progressively address the actual needs of the stakeholder communities.

Follow us on LinkedIn for the latest updates on the CEF Digital programmes.

https://guide.5gcorridors.eu/