**Key NeTIRail outputs**

**Guidance and decision support tools**
Assessment of economic and societal impact of rail transportation to examine costs, benefits and viability of lines and their investment decisions.

Decision support software for rail system operators to apply the methods developed to their own lines.

**Demonstration of technologies and operational strategies**
- Track infrastructure design and maintenance optimised for particular routes and track types.
- Lean optimisation of S&C and OHL operation and maintenance.
- Tailored overhead line power supply infrastructure providing solutions for low cost electrification.
- Low cost on-vehicle and lineside monitoring with interfaces to existing railway technology to optimise operation, maintenance and renewal of the infrastructure.

**Guidance and decision support tools**
- Assessment of economic and societal impact of rail transportation to examine costs, benefits and viability of lines and their investment decisions.
- Decision support software for rail system operators to apply the methods developed to their own lines.

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**Facts and Figures**
- Total budget – 5.4m€
- Duration – 36 months
- Project start date – 1st June 2015
- Project end date – 31st May 2018
- Partners – 13 partners from 8 different countries
- Grant agreement no - 636237

NeTIRail-INFRA is funded by the European Commission under the Horizon2020 programme.
Railway lines across Europe face different demands and challenges, from capacity constrained lines where the challenge is to further increase services and shorten travel time, through to underused and subsidised lines with ageing infrastructure where cost reduction is critical to the sustainability of the track whilst still maintaining interoperability and safety standards.

The approaches to maintenance and operation, and technology deployed on these lines should differ in order to provide an optimal solution for each scenario. The business cases for the marginally viable lines should also consider the societal impact which railway service provides in connecting communities and providing economic agglomeration effects as well as providing diversionary routes which enhance the overall resilience of the railway system when perturbations occur elsewhere on the network.

NeTIRail-INFRA is developing and demonstrating technologies and best practice tailored to the needs of different categories of rail systems. The consortium consists of railway infrastructure managers and operators as well as supplier and research organisations who will deliver innovative concepts of new technologies and for railway operation, and analyse current best practice to identify optimal solutions to be applied to different line categories across Europe. NeTIRail-INFRA also assesses the societal impact of railway and the business case for each alternative asset management strategy and the applications of the new technologies developed, including consideration of the incentives and regulatory and financial frameworks across the EU member states.

**Project organisation**

The project is divided into 7 different interconnected work packages to develop technical innovations, economic and social business cases for technical work, and the development of end user decision support tools.

**Contrasting market needs, and business case**

Definition of the scenarios and the business case, including optimisation of investment costs, recurring operational cost, component life, and maintenance requirements for best societal and economic outcomes for the different railway categories.

**Tailored track infrastructure, design and maintenance**

- Geospatial comparison of infrastructure costs and maintenance drivers for high and low capacity lines.
- Application of lean and automotive optimisation to S&C maintenance and design.
- Life extension of plain line through preventing corrugation.
- Tailoring lubrication to duty and climate.
- Cost effective transition zone design.

**Tailored overhead line power supply infrastructure**

- Identification of the factors that influence performance of overhead line, including climate.
- Tailored solutions for improving the quality and performance of overhead line power infrastructure.
- Solutions for minimising the life cycle costs of existing and new overhead line infrastructure.

**Monitoring and smart technology**

- Use of low cost track monitoring modules for understanding dynamic loading for plain line and S&C.
- High precision infrastructure monitoring using in service vehicles.
- Real-time monitoring of the safe condition of infrastructure critical components and wireless data transmission.
- Low cost smartphone sensors for vehicle and infrastructure monitoring.

**Societal perspective**

Collection and analysis of user perceptions and the value placed on different service options including the alternatives if rail travel was no longer available. These societal perspectives will feed into the overall business case and decision support tools.

**Evaluation and decision tools**

Development of software decision support and evaluation tools to enable railway decision makers to determine the optimum infrastructure installation and maintenance for the different categories of lines.

**Dissemination, training needs and influence on guidelines and standards**

- Disseminate guidance on cost efficient and high productivity rail infrastructure management.
- Communication on decision support tools to achieve the best economic, technical and societal impacts for the rail network.
- Exchange of information and good practices within and outside the project.