

CLIMATE ADAPTATION OF RAILWAY INFRASTRUCTURE MAINTENANCE

ClimRail

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Nyttor och effekter

- Improved resilience and robustness: The proposed RCM-based method will improve the railway infrastructure to withstand climate-induced hazards and ensure that preventive barriers remain effective. Ensures required functions of railway components and availability of railway line.
- Economic Benefits: The proposed methods will minimize unscheduled maintenance, optimize scheduled maintenance, and extend the operational life of both components and the infrastructure.
- Environmental Impact: Effective maintenance will decrease the environmental footprint by improved maintenance productivity, but also reduced amount of corrective maintenance, number of renewals and necessary investments.
- Social and Economic Gains: The project will enhance the socio-economic impact of the whole transport system by attractive rail transports that have improved capacity usage, price, and quality of service (punctuality and regularity) for both travelers and goods.

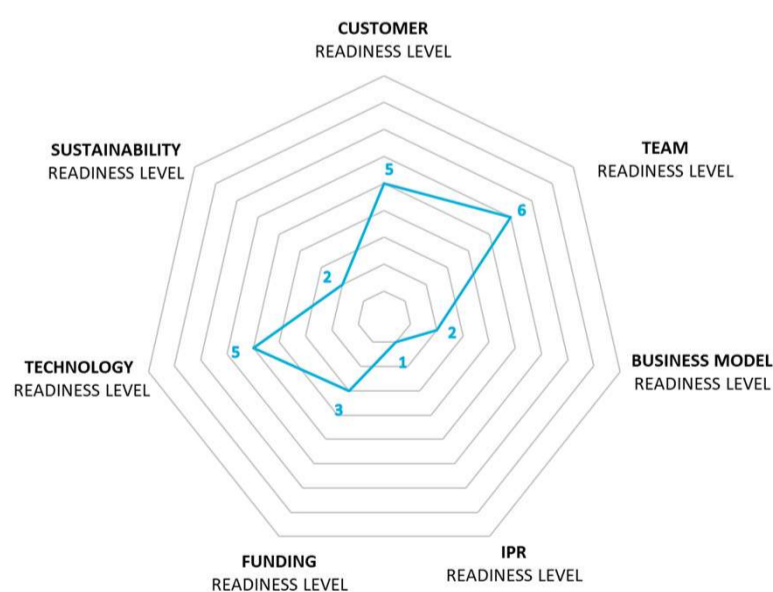
Aktörskonstellation

Luleå Tekniska Universitetet, through Luleå Railway Research Center (JVTC), leads the project. The project involves a close collaboration with Trafikverket (Swedish national transport administration), to align adaptation strategies with national railway operations. LKAB, a major industrial entity, and BDX Rail AB, a leading rail services provider, offer practical insights into operational challenges and maintenance needs. Additionally, Saab Aerotech brings cross-industrial experience from the aviation sector, enhancing the project with its proposed RCM methodology. Internationally, the University of Maryland's Center for Technology and Systems Management and the Indian Institute of Technology - Kanpur (IIT) contribute their research prowess and global perspectives. They enhance the project's scope by focusing on climate risk assessment and advanced maintenance technologies.

Leveranser

- A demonstrator for RCM-based decision support framework for evaluating and adapting maintenance of railway tracks to climate change.
- A guideline for the application of the proposed RCM framework.
- A report on recommendations for changes in maintenance regulation and practices.
- A report on risk assessment of railway tracks on the Swedish Iron-ore line with respect to climate change.
- Workshops to transfer knowledge and train the partners to implement the outcomes.

Innovationsstatus



After a year of progressive development, our innovation show strong customer readiness and substantial funding support—key elements for successful market entry and ongoing viability. However, as we continue to evolve, our business model requires additional refinement to ensure better alignment with other readiness factors. Continued enhancements in team dynamics, technological advancement, intellectual property rights, and sustainability measures are crucial. These steps will further elevate the success and impact of our innovation in the years to come.



Vidareutveckling och implementering

The implementation plan includes a key case study conducted along the Iron Ore Line in northern Sweden.

All project partners are set to engage actively in testing and verifying the solutions to ensure they are both practical and effective in real-world settings.

The project's implementation plan encompasses a series of training sessions and workshops. These are designed to equip all partners with the necessary skills to effectively utilize the methodologies developed during the project.

Trafikverket is currently working with Fault Tree Analysis (FTA) and Failure Modes, Effects, & Criticality Analysis (FMECA) to improve the maintenance programs. The project supports this development by providing RCM-logic from a climate change perspective.

Trafikverket is currently focusing on improving the availability and robustness of the Iron Ore Line to meet the need of its users. The project complements this effort by additional knowledge and insight.

Trafikverket is currently implementing a new maintenance system. The project supports this implementation by providing information models based on RCM-logic, which is used in modern dependability and maintenance standards.

Med stöd från

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