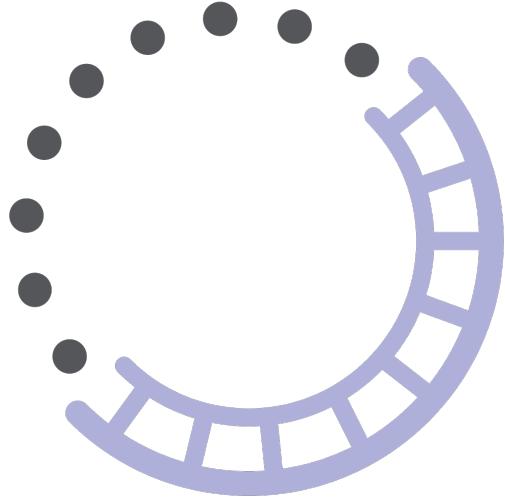


# **Building Open Foundations for Railways**

Annual Report 2025 of the OpenRail Association



**OPENRAIL**  
ASSOCIATION

OpenRail Logo

# Table of contents

- Introduction
  - Message from the Chair of the Board
  - Perspectives from the Board
  - Executive Summary
- The OpenRail Project Portfolio
  - OpenRail Projects Overview
  - First Project Reaching the Qualified Stage
  - Further information
- How OpenRail Creates Impact
  - Open Source in Production
  - Collaboration between OpenRail Projects (NGE)
  - Innovation through Open Source (DAC Migration DSS)
  - Building blocks (libLRS)
  - Open Source fosters adoption of standards (RCM OSS)
- Community and Ecosystem
  - OpenRail Day @Paris - Collaboration in Practice
  - Hack4Rail 2025 in Bern - Innovation through Open Source
  - Railways and Open Transport Devroom at FOSDEM 2025 - Community at Scale
  - Digital Resilience - Strategic Outlook
- The Association
  - How the OpenRail Association works
- The Association
  - Our Members
  - Join us
- Endnotes
  - Website
  - Contact
  - License
  - Trademarks

## **Introduction**

## **Message from the Chair of the Board**

Jochen Decker

The railway industry can't ignore geopolitics. In a rapidly evolving geopolitical environment, digital resilience — grounded in sovereignty and security — has become a strategic necessity for critical infrastructure. Across the rail sector, Open Source is increasingly recognized as a cornerstone of resilient digital systems. This reinforces the strategic relevance of the OpenRail Association and its mission to advance the collaborative development of Open Source Software for rail.



### **From Foundation to Delivery**

During 2025, we further strengthened our organization by improving governance, increasing efficiency, and sharpening our ability to support members and projects. This consolidation has positioned us to scale collaboration more effectively.

### **Creating Real Value**

OpenRail projects create value by translating collaboration into solutions that are built and used in real-world operations. The Netzgrafik-Editor / Open Source Railway Designer collaboration between SBB and SNCF is one example that demonstrates this approach. Together, OpenRail projects show how open source practices generate tangible business outcomes.

### **A Community Gaining Momentum**

The growing maturity of our community was clearly visible at OpenRail Day @Paris. The professionalism, openness, and engagement on display reflected an ecosystem aligned around collaboration as a driver of digital transformation in rail.

### **Looking Ahead**

2025 marked the shift from foundation-building to measurable impact. As we enter 2026, momentum is growing and collaborative software development is proving its ability to build practical solutions for rail.

**Yours sincerely,**

**Jochen Decker**

*Chair of the Board of Directors at OpenRail Association*, Chief Information Officer at **SBB**

## Perspectives from the Board

### Daniel Woithe

Daniel Woithe



*“The year 2025 was marked by significant progress and increasing engagement within the Open Rail Association. Open Rail Day in Paris was a highlight that demonstrated both the speed of development and the effective collaboration within the community. In 2026, open source will become an even more important part of IT strategies, particularly in light of economic pressures and geopolitical tensions.”* – Daniel Woithe, *Vice-Chair*, CTO at **DB Systel GmbH**

### Mounir Belhamiti

Mounir Belhamiti



*“At SNCF Group, we strongly believe that open source and open standards are key drivers of innovation and resilience for the railway sector. As members of the Board of the OpenRail Association, we are proud to actively contribute to this collective initiative and to support the development of open and interoperable digital foundations for rail. We were also honored to welcome the OpenRail Day in Paris last December, a strong symbol of our shared commitment to collaboration across the railway community.”* – Mounir Belhamiti, *Vice-Chair*, Director Strategy and Development at **e.SNCF Solutions**

### Jean-Michel Evangelou

Jean-Michel Evangelou



*“2025 has seen the acceleration of the open source concept all over the world, particularly through the intensive and impressive evolution of A models but not only. It now becomes clearer and clearer that open source is a major vector of innovation and business, not contradicting the search by private companies for market leadership or financial outcomes, because the genuine capacity to sustain the pace of innovation is to replace more and more the traditional owned assets in intellectual domains. The mission of OpenRail is then obvious and exciting: to facilitate this disruptive transition also in the railway domain.”* – Jean-Michel Evangelou, *Vice-Chair*, Director Digital Systems & Innovation, Director Financial Control & Project Operations at **UIC**

### Peter Franken

Peter Franken



*“When introducing the open-source philosophy to Infrabel’s Product Owners, I was struck by the genuine enthusiasm it generated. Everyone immediately recognised that we share the same challenges—and that building solutions together is the most natural path forward. Now let’s all free up some space in our busy agendas to put this strategy into action and truly get the ball rolling!”* – Peter Franken, *Director*, Deputy CIO, Head of Real Time & End User Solutions at **Infrabel**

### Fatima Zohra El Ouerkhaoui

## Fatima Zohra El Ouerkhaoui



*“OpenRail is The platform to design and build strong standardized and interoperable Railway solutions, reinforce the collaboration around that in the Railway community, and take all advantages offered by Open Source to achieve that. At ONCF, and because Railway sector is still facing challenges of complex in house development, we believe that this community is here to bring answers to the daily complexities that the sector is facing and empowering the digitalization of future mobility following open standards and giving the capabilities for acceleration and interoperability. These initiatives are also necessary to reduce the technical debt, and respect best standard for cybersecurity and sovereignty. The outcome exhibited during the OpenRail day in Paris confimes that we are in the right track and makes us proud and also excited of all the success to come.” – Fatima Zohra El Ouerkhaoui, Director, Chief Information and Digital Officer, Board member at ONCF*

## Brede Dammen

### Brede Dammen



*“Open source and open standards are fundamental to enabling seamless, cross-border rail services in Europe. Frameworks such as MMTIS and the new TSI Telematics clearly point in the same direction: interoperable, standardised, and easy-to-use data across operators and national borders. From Entur’s perspective, openness is a practical necessity – it lowers barriers for collaboration, reduces fragmentation, and allows shared digital services developed through the OpenRail Association to deliver real value for railway operators, developers, and the passengers.” – Brede Dammen, Director, Product owner, national journey planner at Entur*

## Erik Nygren

### Erik Nygren



*“In an industry that inherently depends on collaboration across borders and organizations, open source has proven to be a vital enabler of innovation with real-world impact – but to truly transform the railway sector, it must be accessible not only to developers but also to the domain experts who understand the real-world challenges. At the Flatland Association, this is at the heart of what we do: building an open ecosystem that empowers anyone to contribute, lowering the entry barrier so that open research and open source can reach the people who need it most. Together with the OpenRail Association, we are making this ecosystem stronger, and events like OpenRail Day in Paris show that this community is growing every year.” – Erik Nygren, Director, President at Flatland Association*

## Florian Amsallem

### Florian Amsallem



*“I am proud to look back on a year marked by significant progress. The technical committee has matured in terms of both governance and execution, formalizing clearer incubation stages – now Onboarded → Qualified → Adopted – to better guide projects and contributors. We celebrated key milestones, such as the close cooperation between SNCF Réseau and SBB on Netzgrafik-Editor and the integration of PopUpSim into the DAC migration DSS. Projects such as OSRD, NGE, RCM-OSS, and LibLRS flourished with new releases, new features, and improved documentation, while promising candidates progressed through the incubation process. Going forward, our improved processes will position us well to welcome more projects and foster collaborations. This is just the beginning.” – Florian Amsallem, Chair Technical Committee, OSRD Technical Lead at SNCF Réseau*

## **Executive Summary**

# **The OpenRail Project Portfolio**

## OpenRail Projects Overview

The following projects are the official OpenRail projects incubated through the [incubation process](#).

### Open Source Railway Designer (OSRD)

OpenRail Qualified

OSRD is an open source web application for railway infrastructure design, capacity analysis, timetabling and simulation and short term path request.

### Rail Condition Monitoring (RCM OSS)

OpenRail Onboarded

RCM by SBB comprises a suite of products for rail condition monitoring. Based on the open source data format RCM-DX (RCM Data eXchange), RCM enables easy accessibility and visualization of railway diagnostic data.

### Digital Automatic Coupling Migration Decision Support System (DAC Migration DSS)

OpenRail Onboarded

Within the next years around 500 K freight wagons all over Europe owned and operated by various corporations will be converted from screw couplers to digital automatic couplers (DAC). To facilitate the migration process, a decision support system (DSS) is planned under the project.

### Netzgrafik-Editor (NGE)

OpenRail Onboarded

Netzgrafik-Editor is now a mature tool for creating and analyzing regular-interval timetables. It's versatile for logistics planning in various domains. Features include interactive editing, graphic timetables, trainrun editing, and logistics analysis.

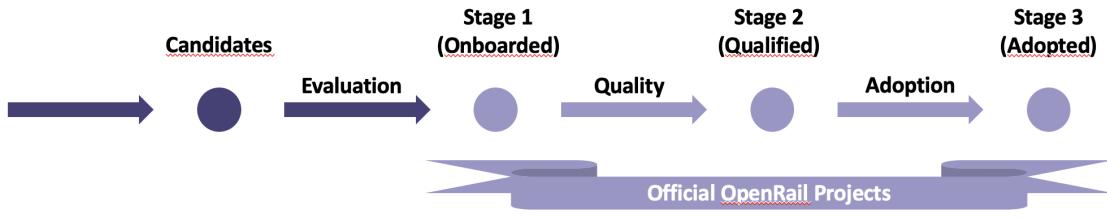
### Library for Linear Reference Systems (libLRS)

OpenRail Onboarded

The goal of the library is to have a flexible, high performance and easy to integrate linear referencing systems (LRS) library that can be used in any system to manipulate LRSs.

## First Project Reaching the Qualified Stage

On February 27, 2025, OSRD became the first OpenRail project to reach the **Qualified stage**, marking a significant milestone in the association's incubation process, achieved in just one year after being hosted by the OpenRailAssociation. The Qualified stage represents projects that have achieved a high level of quality and maturity, ready for production use by end users.



Project Funnel

To reach this stage, the OSRD team undertook substantial work to meet eight rigorous criteria covering governance, security, and development practices. Key achievements included documenting the release process, establishing a comprehensive security policy, and conducting an OpenSSF Scorecard benchmark that scored 6.1/10. The project implemented **REUSE compliance** with automated CI checks to ensure licensing clarity, and enforced the **Developer Certificate of Origin (DCO)** to guarantee code provenance. Perhaps the most significant requirement was demonstrating a healthy and stable contributor base, which OSRD achieved through consistent contributions from SNCF Réseau and active production deployment.

This qualification signifies that OSRD has established robust processes for external contributions, transparent governance, and industry-standard security practices. The improved documentation and clear pathways for participation make OSRD more accessible to contributors and adopters throughout the railway industry, positioning it as a mature, production-ready solution for railway operations and capacity planning.

## **Further information**

OSRD Github Page: <https://github.com/OpenRailAssociation/osrd> OSRD website: <https://osrd.fr/en/> OSRD Documentation: <https://osrd.fr/en/docs/>

## **How OpenRail Creates Impact**

## **Open Source in Production**

*How OSRD is used in production. This shows how open source projects can be used for production use cases, and how OpenRail projects increase their relevance.*

## **Collaboration between OpenRail Projects (NGE)**

*Tell how Netzgrafikeditor gained contributors from SNCF and how collaboration works today. Show the metrics for this and hint to the metrics report.*

## **Innovation through Open Source (DAC Migration DSS)**

Innovation doesn't always start in boardrooms. There is also grassroots development in the railway sector, such as PopUpSim. PopUpSim is an independent part of the DAC Migration DSS with its own repository. It joined the OpenRailAssociation in 2025.

The idea for PopUpSim emerged during the Dreiländerhack (now: Hack4Rail), which took place from 30 September to 1 October 2024 in Berlin. A team of developers from DB, SBB and ÖBB tackled a challenge concerning the simulation of wagon flows from operations to workshops and back to operations during the migration from the screw coupler to the Digital Automatic Coupler. The team created a demonstrator and won third prize at the hackathon.

<p>

After some time, which was necessary to create an environment for further development, a new team started working on the project. On 17 December 2025, it was already possible to present a veritable Minimum Viable Product to the public at OpenRailDay in Paris.

<p></p>

The team is now working ambitiously to fully realize the idea of PopUpSim, secure funding for further development, and promote its use. Another aspect is worth noting: as mentioned above, PopUpSim supports the rollout of the Digital Automatic Coupler. The introduction of the Digital Automatic Coupler is not just a challenge faced by every actor in the rail freight sector; it is a challenge that must be solved collectively by the entire sector. There are more than 500,000 freight wagons across Europe. A typical freight wagon does not operate in only one country; it usually runs cross-border and is hauled by traction from many different railway undertakings. In many cases, wagons are owned by leasing companies rather than by the railway undertakings themselves. To make matters even more challenging, not only mainline railways must be able to handle wagons; port railways and industrial sidings must also be able to receive and move wagons at all times during the migration period. This shared challenge clearly calls for an open-source solution. It can be used by everyone free of charge, its code is transparent, and users can adapt it to their needs and share it with their customers and partners.

## **Building blocks (libLRS)**

*Show how liblrs is used as a building block in ORSD and other projects. Explain what makes liblrs suited for that.*

## **Open Source fosters adoption of standards (RCM OSS)**

*Show how RCM OSS is used as a standard, who uses it, and how open source helps with that.*

Data from diagnostic measurement vehicles is essential for SBB to manage maintenance efficiently and to enable safe railway operations. These vehicles continuously record detailed infrastructure data — forming the foundation for a reliable diagnosis of track and overhead line condition. One of the challenges in Railway Infrastructure Diagnostics is the prevalence of proprietary data formats and software. Measurement system suppliers deliver their hardware with proprietary data formats and software. Diagnostic measurement vehicles harbour multiple of these systems and are therefore easily subjected to a variety of data formats and required software licences. In addition to the resulting complexity of data processing, proprietary elements also make it difficult to store such data in a readable form for the required period of time of up to 20 years. The RCM-DX file format is available open-source. With RCM-DX we step away from proprietary data formats which require specialised software and know-how, towards a self-contained and open format. RCM-DX can be accessed through standard HDF5 tools. In addition to the already published MATLAB function, we have added a python function to facilitate more specific reading of RCM-DX files. The accompanying visualisation software, RCM-DX Viewer, is available as freeware. By using the open RCM-DX format together with a freely available viewer, we can create a consolidated view of different sensor data and perform time-series diagnosis across multiple measurement runs. More than 500 users such as rail inspectors, data scientists, engineers and infrastructure managers are using RCM Tools regularly. The use of an open standard ensures full control and data sovereignty, enabling long-term flexibility in the choice of analysis methods and tools.

## **Community and Ecosystem**

## **OpenRail Day @Paris - Collaboration in Practice**

*Report from OpenRail Day. Workshops, Exhibition, Conference, Board Meeting. Use photos.*

## **Hack4Rail 2025 in Bern - Innovation through Open Source**

*Report from Hackathon and how OpenRail acted as partner. Outlook to Hack4Rail 2026 in Vienna.*

## Railways and Open Transport Devroom at FOSDEM 2025 - Community at Scale

*Report from FOSDEM 2025*

## **Digital Resilience - Strategic Outlook**

*How and why digital resilience is an important topic for OpenRail. Report from Digital Resilience Forum, and about support for European Sovereign Tech Fund and the Declaration of Digital Independence.*

## **The Association**

## **How the OpenRail Association works**

*Add canonical picture of organization structure and description of how it works. Different working bodies etc.*

## **The Association**

## Our Members

We are grateful to our members for their commitment to open collaboration in the railway sector. Their engagement and support drive the success of the OpenRail Association, helping to build a strong, sustainable, and innovative open source ecosystem. The following organizations are part of this movement.

### Platinum



### Gold



### Silver



Entur

### Associate



EONA-X

## Join us

The **OpenRail Association** is more than just an organization—it's a **community of people and companies** working together to bring **open source to the railway sector**.

Railways across Europe face **shared challenges** that require **shared solutions**. Open source enables us to **collaborate, innovate, and break down silos**, ensuring that essential software is **interoperable, efficient, and sustainable**.

## Bring Your Project to OpenRail

OpenRail actively **welcomes new projects** into its **incubation process**. If you have a project that could benefit from **structured governance, a wider community, and long-term sustainability**, our **Technical Committee** provides guidance, best practices, and a neutral home for open source railway software.

## Ways to Get Involved

✉️**Join as a Contributor** – Explore our projects and start contributing: [github.com/OpenRailAssociation](https://github.com/OpenRailAssociation)

✉️**Propose a New Project** – Learn about our **incubation process** and bring your open source initiative to OpenRail: [github.com/OpenRailAssociation/technical-committee](https://github.com/OpenRailAssociation/technical-committee)

✉️**Become a Member** – Organizations can **support and shape the ecosystem** by joining as members: [openrailassociation.org/about](https://openrailassociation.org/about)

## Membership Levels & Engagement

OpenRail offers **four membership categories**, providing different levels of engagement and governance representation:

Membership Category	Role & Influence	Annual Fee (2024)	Representation on Board
<b>Platinum</b>	Strategic leadership in OpenRail's direction	<b>25,000 €</b>	<b>7 seats</b>
<b>Gold</b>	Active participation in governance & decision-making	<b>15,000 €</b>	<b>3 seats</b>
<b>Silver</b>	Engaged collaboration in OpenRail's open source ecosystem	<b>10,000 €</b>	<b>1 seat</b>
<b>Associate</b>	NGOs, academic institutions supporting OpenRail's mission	<b>Free</b>	<b>1 seat</b>

Platinum, Gold, and Silver members **directly shape OpenRail's governance**, with seats on the **Board of Directors**, where key decisions about the association's strategy and operations are made.

## Be Part of the Movement

Our work is **transparent, community-driven, and open to all**. If you're interested in **being part of this movement**, explore our projects, participate in discussions, and see how you or your organization can contribute.

## **Endnotes**

### **Website**

Find more information on the OpenRail Association at <https://openrailassociation.org>.

### **Contact**

To contact the OpenRail Association send us an email at [contact@openrailassociation.org](mailto:contact@openrailassociation.org).

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