

RAIL INFRASTRUCTURE ASSET MANAGEMENT SUMMIT

31st January -1st February 2024, 20 Water Street, Wood Wharf, E14

Unlocking the Power of Digital Strategies in Rail: Demonstrating the Value of Technology and Innovation to Justify Investments in Digital Initiatives

Embracing Technological Advancements in AI, Machine Learning and Mathematical Optimization to Shape Sustainable and Efficient Rail Asset Management Practices

The **Rail Infrastructure Asset Management Summit 2024 (RIAMS)** provides a platform for global railway infrastructure owners, undertakers, suppliers, and stakeholders to **collaborate on ongoing efforts to leverage technology**, data, and analytics for more effective asset management, operational efficiency, and enhanced safety in rail operations.

At **RIAMS2023**, our line-up of global speakers from high-speed rail companies will share valuable real-world experiences from across Europe and Asia providing actionable insights, practical applications, and **evidence-based discussions** on strategies for balancing asset renewal, refurbishment, and **maintenance activities**.

Gain insights into the latest technological advancements, including **AI, machine learning, and mathematical optimization**, discover how infrastructure owners are turning data into actionable solutions for traffic planning, dispatching, and optimizing track capacity, developing a holistic approach to big data, AI, and advanced analytics to cultivate a **data-driven mindset in rail** and improve asset lifecycle planning while considering the broader impact on system safety and **value for money**.

STRATEGIES FOR ENHANCING DATA QUALITY AND RELIABILITY, OVERCOMING CHALLENGES IN MANAGING LEGACY DATA SYSTEMS TO IMPROVE DATA TRANSPARANCY IN RAIL

9:00 STRATEGIC OPENING PANEL: Developing A Holistic Approach to Big Data in Rail, Harnessing Data and AI for Enhanced Rail Reliability, Decision-Making and Safety in Rail

"Machine learning and AI now has progressed to the level where you don't need to do that if you build this properly, you don't need to be looking at the computer systems, the computer can tell you, if you build it properly, there's a problem here in two days' time or two weeks' time or three weeks' time. So, you could spend more time in the field rather than just looking at computers to see what could go wrong. So, it's more switching off the engineering mind to just show me what happened. Now it's important to know what happened if you are trying to understand faults. I'm not saying that you don't. But it's more important that I am looking ahead to say well, what data do I need, what parameters or features do I need to come up with an algorithm that can predict when this asset is going to fail for this failure mode?"

IAMS and Mobility Manager, National Infrastructure Owner, Ireland

- What are the common challenges in improving digitalization and data management, exploring gaps in digitization, and addressing challenges in storing and retrieving asset information efficiently.
- Transforming Data into Value, examining the process of turning raw data into actionable insights, informed decisions and the potential of AI and machine learning in analysing big data streams
- Addressing the challenge of establishing shared information flows and improving standards for common data use within rail operations and maintenance
- Enhancing Rail Reliability, examining the significance of reliability challenges in rail operations and how data-driven insights can improve component resilience and prevent failures.
- Exploring the economic and operational benefits of investing in data management for reliability improvement, addressing the operational advantages of resilient rail systems under varying conditions.

Jude Carey, Head of Asset Management, Irish Rail

Tim Flower, UK Account Director, KONUX UK LTD

Milind Joshi, Head of asset management strategy & Planning, Network Rail

9:45 Optimising Data Transparency in Rail, What Data Do We Have, Availability of Data and Understanding the Limitations of Your Data

"So, from my point of view, we have three big or maybe four big points that need to be addressed. The first one is transparency, what data do we have, what data is available, and there are other problems in knowing what we have and where the limitations are. We work with legacy I.T and with massive quantities of data that is entered manually. So, we need good transparency. What do legacy systems do with the data when they process it before we get to use the data for our algorithms?"

Head of Algorithms for Operations, German National Infrastructure Owner

- Understanding the importance of data transparency in rail operations, developing strategies to improve transparency, data quality and identifying alternative available data sources.
- How are owners confronting the challenges of integrating legacy IT systems and improving the accuracy of manually entered data to build reliable algorithms for rail operations.

- Building trust through transparent data practices, defining the limitations of your data and models to build confidence in models used to improved decision making in rail.
- Examine how owners are working with suppliers in leveraging visualization techniques to enhance data understanding throughout the organisation.
- Empowering reliability engineers and asset managers as data stewards and fostering collaboration between different departments for holistic data use.

Hannah Richta, Head of Algorithms for Operations, DB Netz AG
Jez Smith, Rail Data Marketplace Lead, Rail Delivery Group

10:30 MORNING NETWORKING BREAK

11:00 Digital Technology – Paradigm Shift in Rail Culture: What Are the Benefits of Establishing a Data-Centric Culture to Enable Operational Decision Making in Rail Using Available Data

"The third one is data quality. So, we need to address the mindset of the people who enter data, they should take to heart that the data that is entered is not just done for some manager to do some nice statistics, but that the data they enter has influence. So, if you don't enter data precisely you get bad decisions and outcomes out of the systems that will try to support you."

Head of Algorithms for Operations, National Infrastructure Owner, Germany

- The role of leadership in championing data-driven decision-making, Cultivating a Data-Driven Mindset in Rail.
- Importance of data quality, addressing the mindset of data administrators and the significance of data quality for effective decision-making, what step are owners taking to improve data quality in rail operations.
- Connecting data quality to the effectiveness of AI systems, emphasizing the importance of accuracy in data entry for AI modelling reliability and highlighting the impact of inaccurate data on decision-making.
- Exploring challenges in transitioning to a data-driven asset management approach, aligning asset management strategies with data insights to improve operational decision making and reduce overheads.
- Recognizing the influence of human intuition on data input, what are the challenges in translating human understanding to AI requirements.

Milind Joshi, Head of asset management strategy & Planning, Network Rail
John Nolan, Regional Asset Data Analysis Manager, Network Rail

ADVANCING DIGITALISATION IN RAIL ORGANISATION AND OVERCOMING CHALLENGES FACED BY RAIL ORGANISATIONS IN SETTING UP COMPREHENSIVE DIGITAL INFRASTRUCTURE WHILE MANAGING COSTS AND DAILY RAIL OPERATIONS

11:30: Empowering Digitalisation in Rail Through Robust Systems Infrastructure, How Do Rail Organisations Set up The Systems Infrastructure to Enable Access to All the Information Required Within a Digital Space

How Space Technologies Could Help Digitalize the Railway

Stéphane Callet, Head of on-board CCS related innovative projects TECH4RAIL, SNCF

12:00 Data-driven Rails: A comprehensive Data & Condition Modelling Framework for Network-wide Optimisation of Renewal & Maintenance Strategies for Public Reporting, Long-term Planning & Government Financing Negotiation

Presentation Abstract: Asset information is often stored in disparate databases with operational performance not linked to causal assets and low data quality on fundamental asset properties linked to life-cycle and planning requirements, including size, intervention, unit costs, and lifetime. For evaluation of Asset condition to determine renewal and maintenance requirements for financing, it is crucial to ensure a high Data Quality foundation. The Network condition evaluation framework builds a structured database of Asset condition through prioritisation of data quality on asset parameters linked to life-cycle evaluation, algorithmic rules and processes for comprehensive data quality control and enhancement, and assignment of disparate data sources to causal assets for renewal and maintenance indication. A portfolio Network condition is then evaluated based on asset KPIs aggregated to a Condition grade, generating a foundation for financing scenario modelling, including potential condition deterioration, renewal and maintenance requirements, and public reporting of current Network asset management.

Alison Cowley, Manager – Asset Management, Digitalisation, AFRY Schweiz AG

12:30 Advancing Rail Safety and Efficiency Through Digitalization, Explore How Digitization is Improving Workforce Safety, Accident Reduction, Error Reduction, Better Fatigue Management Leading to Productivity Increase in Operations

"It's always also about doing the things that give me a very clear safety element around workforce safety, accident reduction, error reduction, productivity increase, better fatigue management, there's lots of stuff that I think digitization brings to the table, it tends to be the barrier usually is you cannot adopt this new technology because it's not safe, there's always that argument. But if you can present it in the angle of increased safety, I think it will change the conversation, it will probably bring down the argument that unions tend to use against this sort of stuff. So, an interesting angle as well to cover or to have someone that can prove that. And I'm sure there are examples of using geofencing and other stuff to improve safety, while increasing productivity and getting some other benefits as well."

*Head of Asset Management & Maintenance, **Strategic Railway Infrastructure Project UK***

- Examining the multifaceted impact of digitalization on rail safety, showcasing how technology contributes to workforce safety, accident reduction, and error reduction.
- Productivity and performance gains, how are digitalisation strategies driving productivity increases, streamlining operations while maintaining a focus on safety protocols.
- Explore the integration of digital tools, such as geofencing and data analytics, to effectively manage fatigue among rail workers, optimizing performance and well-being.
- learn how emphasizing safety benefits of digitalization can shift the narrative from potential risks to tangible safety improvements, potentially mitigating concerns raised by unions and other stakeholders.

*Dylan Edwards, Senior Programme Manager, **Network Rail***

13:00 LUNCH NETWORKING BREAK

BENEFITS OF INVESTING IN DIGITAL STRATEGIES FOR DATA COLLECTION AND OPTIMIZING DECISION-MAKING PROCESSES, BUILDING JUSTIFICATION FOR INVESTMENT IN DIGITAL SYSTEMS TO IMPROVE OVERALL EFFICIENCY IN RAIL OPERATIONS

14:00 Increasing the Quality of Point Clouds and Understanding Which Asset Information Can Be Modelled

GeoNext will present practical examples of how to increase the quality of a point cloud, the higher the quality of a point cloud, the more detailed information can be extracted. We show how to improve a misalignment of a mobile collected point clouds.

*Nico Schaeffers, Owner, **GeoNext B.V.***

14:30 Exploring the Potential and Challenges of Implementing BIM and GIS Technologies to Improve Life Cycle Management, Reliability and Safety in Rail Asset Management

"The industry is working; I don't think we are very mature in that space compared to others now. So, that the opportunity to we should be learning around how to, you know, what, what systems are available, or techniques available to store asset info especially where you've renewed or maintained an asset to avoid duplicating, doing that same work again, to survey or design, being able to retrieve that data."

*Head of Engineering & Asset Management, **National Infrastructure Owner, UK***

- What is the current industry level of maturity, incorporating digital twin and GIS technologies into rail projects, particularly focusing on advanced stations, route planning, and safety measures.
- Predictive analytics for passenger safety, real-world applications, benefits, and challenges of using digital twins for ensuring passenger safety.
- Rail renewals, potential for digital twins in planning rail asset renewals, examine how digital twins can improve decision-making, predictive maintenance, and optimising the lifecycle of rail assets.
- Integrating artificial intelligence (AI) and machine learning (ML) in conjunction with digital twins in rail asset management, enhancing data analysis, modelling, and prediction to improve decision-making in rail.

*Claire Nicodeme, Engineer & Research Project Manager, **SNCF***

15:00 Using BIM and GIS for Lifecycle Management in the Rail Baltica Infrastructure Project

- Collecting information in the design stage, preparing asset information for the operations phase
- BIM processes, models, drawing, reports, and data drop
- What information do you have and what information is needed to attribute information in BIM models?
- Key attributes to uniquely identify the elements and group data by type numbers.
- Digital information and requirement for construction and handover stages

*Urmas Alber, AIM Team Leader, **RB Rail AS***

15:30 AFETRNOON NETWORKING BREAK

16:00 GIS @ Infrabel: Examining the Wider Benefits from Railway Network Management to Worker Safety

- What is Infrabel responsible for?
- How have we introduced GIS at Infrabel (with the example of the InfraGIS application and its different representations: geographic, schematic & photographic via “RailView”)?
- How can GIS & geolocation be used to ensure worker safety on railway construction sites (presenting examples of some projects under the “Safer-Work” programme)?

Damien Paque, Team Leader Geo Services & Solutions, Infrabel

16:30 Machine Learning and Mathematical Optimization in Rail, Demonstrating the Use Case of Technology, and Innovation in Rail Projects, what are the Potentials Savings in Performance, Maintenance and Renewals Cost?

“To see the application of machine learning or AI and understand what the additional cost that you have, either by software by getting a team of data analysts, whatever it is, and how much money are you saving from implementing that, in terms of performance in terms of cost reduction, I think that’s probably going to be difficult, because we’re doing this won’t have enough data to tell you that we’ve saved millions over the renewal cycle.”

Head of Asset Management & Maintenance, Strategic Railway Infrastructure Project UK

- Building Complete Models, exploring the ease and challenges of constructing comprehensive models using data-driven approaches, AI, and mathematical optimization to enhance railway operations.
- What is the initial cost associated with AI and Machine learning and what are the expectations on ROI, potentials savings in performance, maintenance, and renewals cost?
- Measuring cost-benefit investing in machine learning or AI, practical approaches to quantify the impact of technology and innovation adoption in rail projects, including AI and machine learning.
- How are infrastructure owners incorporating artificial intelligence and machine learning in railway algorithms to drive innovation and creative problem-solving.
- Expertise and collaboration, how are interdisciplinary teams, including mathematicians, railway engineers, and I.T professionals, collaborating to develop solutions tailored to the unique challenges of rail asset management.
- Standardization vs customization, finding the optimal balance between standardizing processes for consistency while allowing flexibility for bespoke solutions based on specific asset systems.

Robert Lacey, Network Technical Head, Track, Network Rail

17:00 PANEL DISCUSSION: Collaborative Strategies for Enhanced Digital Asset Management Capabilities, Best Practice Working with Partners, and Suppliers to Optimize Asset Reliability for Small and Large Infrastructure Owners to Reduce Cost in Maintenance

“So, that’s also something that changed in terms of my perspective over the last year is, initially I thought I would have my own team of data analysis and all that. I don’t want to do that anymore. I think there’s really lots of companies out there that are really specialized in getting the data from my sensors process, that gives me the nuggets, and then I bring that back to the experts, and they will make the decisions based on that.”

Head of Asset Management & Maintenance, Strategic Railway Infrastructure Project UK

- Discover how collaborative partnerships can revolutionize digital asset management, optimizing data strategies and boosting information capabilities within the constantly evolving data landscape.
- Gain insights into how rail companies are shifting from in-house teams to leveraging specialized external resources, streamlining asset information management while allowing them to focus on core competencies.
- Explore the benefits of internal teams vs dedicated companies for processing sensor data and asset information, enabling efficient decision-making and maintaining data relevance.
- Working with owners to build a robust case for investing in condition monitoring systems, calculating the tangible costs of failures and unreliability, enabling accurate ROI forecasting for the investments in condition monitoring.
- How are smaller organizations enhancing their data strategy by identifying the right partners and cooperation models, regardless of budget constraints, offering a pathway to initiate improvements incrementally?

Tim Flower, UK Account Director, KONUX UK LTD

Claus Klint, Worldwide Industry Sales Leader, Civil Infrastructure, IBM

Rob Forde, Director of Strategy and Skills, GCRE

18:00 END OF DAY ONE

DAY TWO

THE EVOLVING LANDSCAPE OF ENTERPRISE ASSET MANAGEMENT SYSTEMS, EXPLORING THE LATEST TRENDS AND CAPABILITIES BEING INTEGRATED INTO THE NEXT GENERATION OF PLATFORMS

9:00 PANEL DISCUSSION: Next-Generation ERP Systems for Rail Operations, Enhancing Predictive Maintenance Capabilities within Asset Management Systems and Achieving Alignment for Effective Rail Asset Management

"The key things are you must have a good asset management platform, right. So, if you don't have the tools set, it's very difficult to implement the resources. Because we are going through it ourselves, you can't leave it to the consultants, you just must be the expert yourself on the asset management tools rather than asset management. And what I mean by that is, there's all these big tools like say SAP, and Maximo, and there are based on industry best practice. So, if you come along, and you're doing things a certain way, and then you decide, well, I want it done the same way that I was doing for the last 20 years, it just doesn't work. You must understand how their tool works and you've got to adapt to how it works and then twist it to so that it works for you and the railway. So, you can't leave consultants, scientists, it must be the internal business has to become the expert on the software, okay, and how it works. You don't have to be a programmer now, but you just need to understand industry best practice and try to keep to industry best practice as much as you can."

IAMS and Mobility Manager, Irish Infrastructure Owner

- Examining the level of predictive maintenance capabilities offered by current asset management system suppliers, including reinforcement learning, supervised learning, and non-supervised learning?
- Delve into the evolving landscape of enterprise asset management systems, exploring the latest trends and capabilities being integrated into the next generation of platforms.
- Essential questions operators should be asking asset management system suppliers to ensure alignment with their specific needs, including predictive maintenance capabilities and the integration of ai.
- The importance of in-house expertise in understanding and adapting to industry best practices within asset management platforms, enabling operators to fully harness their potential.
- Highlighting the importance of integrating open-standard toolsets into asset management platforms, allowing for flexible data ingestion and AI development to enhance predictive maintenance accuracy.
- The connection between asset management systems and predictive maintenance algorithms, emphasising the need for seamless integration to trigger maintenance activities and streamline decision-making.

Jude Carey, Head of Asset Management, Irish Rail

Claus Klint, Worldwide Industry Sales Leader, Civil Infrastructure, IBM

Tim Flower, UK Account Director, KONUX UK Ltd

9:45 Global Centre of Rail Excellence: From the Physical to the Digital and Back Again

- Provide an overview of the plan for GCRE
- Technical capability GCRE will provide
- GCREs approach to digital twins
- Outline our digital monitoring plans

Rob Forde, Director of Strategy and Skills, GCRE

10:15 Sustainable Decision Making with Lifecycle Management

- How we can reduce costs through differentiation on lines.
- The relationship between reliability, availability, safety, health and environment.
- How we include these factors in our decision-making process.
- How we make sustainable decisions

Martijn van Noort, Maintenance Management Expert, Life Cycle Management, ProRail

10:30 MORNING NETWORKING BREAK

11:00 Transforming Infrastructure Maintenance and Monitoring with High-frequency Multimodal Data Capture and Advanced AI Solutions.

This session will focus on how Cordel are using AI to bring together multiple sources of monitoring and Infrastructure data into its Rail Data Platform (RDP) to derive true insights into the condition and associated maintenance of infrastructure assets. Using 'real' AI, we believe we can deliver a fundamental change to the approach to maintenance without having to reinvent the wheel and rip and replace existing systems.

Nick Smith, VP Europe & Middle East, Cordel Group PLC

DEVELOPING PREDICTIVE MAINTENANCE STRATEGIES WITH A FOCUS ON DATA INTEGRATION, IDENTIFYING CRITICAL FEATURES AND PARAMETERS TO DEVELOP ACCURATE PREDICTIVE ALGORITHMS

11:30 Unlocking a 40-Year Investment Opportunity: Navigating Asset Condition, Demand Dynamics and Precise Estimations

"If you want to do predictive maintenance, there are only three things, reactive maintenance, scheduled maintenance, our remaining useful life. So, if you have worked out what features or parameters for those three different processes, then you're in a good position if you're planning. But if you only plan for reactive, you might say a pity we didn't collect this other data, when we started reactive, because this didn't just switch on tomorrow and off you go, like you need data. And the data must be coming into the system, but it's just to plan it as a holistic approach, rather than dealing with one process."

IAMS and Mobility Manager, Irish Infrastructure Owner

- Implementing a holistic maintenance strategy, what are the benefits integrating reactive, scheduled, and remaining useful life maintenance for a comprehensive approach to improving asset reliability in rail.
- Breaking data silos to address challenges related to data isolation within rail departments, understanding the importance of sharing information for informed decision-making.
- The value of leadership in transformation, the role of organisational leaders in aligning departments toward a common predictive maintenance vision
- How are owners working with partners and suppliers to develop tailor-made AI tools to accommodate rail-specific needs, moving beyond generic solutions to deliver real value from investments in digital solutions.
- The importance of open standards collaboration, highlighting the value of open standard tools like Python in building an adaptable data ecosystem for robust predictive modelling to optimise maintenance scheduling.
- What are the tangible benefits of deploying more advanced sensors across the network to improve situational awareness of train location and the state of track assets.

Joanne Parkes, Head of Asset Management, HS1

James Carey, Principal Consultant, PA Consulting

Mat Ripin, Head of High Speed Track Engineering (Former), Network Rail High Speed

Ben Gough, Senior Principal Civil Engineer, Mott Macdonald

12:10 Optimising Predictive Maintenance Through Data, AI, And Machine Learning, Real World Examples Within Rail Projects of Using Big Data to Improve the Accuracy of Models Used to Predict Asset Failures

"So, for example, with the predictive maintenance and AI, so basically, like, I am dealing with the SNCF, the Belgian railways, like many of the railways are on these diverse groups. So, but basically, no one has cracked it with regards to predictive maintenance. Now, when you do predictive maintenance the asset that you're doing predictive maintenance can vary from country to country. So, it's not like that you solve the problem in Ireland? And then you can apply the same solution worldwide because we've different assets."

IAMS and Mobility Manager, Irish Infrastructure Owner

- How is the rail industry working to enhance collaboration and share efforts to leverage data, ai, and machine learning to enhance the accuracy of predictive models aimed at forecasting asset failures.
- Comparative analysis, sharing case studies from different railways, revealing how various operators approach predictive maintenance using these technologies and the varying levels of accuracy achieved.
- Exploring the role of emerging talents in driving breakthroughs within railway organisations, where skilled individuals combine data science and domain knowledge to develop innovative solutions.
- Evaluating the adaptability of asset management platforms to accommodate diverse machine learning and ai methods, recognizing that solutions may differ due to the unique nature of railway assets across regions.

Claire Nicodeme, Engineer & Research Project Manager, SNCF

12:40 Navigating Rail Asset Management Complexity: How Are Rail Organisations Measuring Their Asset Management Maturity to Ensure Profitable Operations, Benchmarking for Continuous Improvement in Rail

"Do you know where you are in terms of your assets, how do we link it to the global or industry level, to get an industry average of whatever metric we are going to pose? So, we look at maturity, do you know what the Asset Management Maturity of your organization is? This is critical to your sustainability."

EMEA Reliability and Asset Management Manager, Global Corporate Real Estate Management Company

- Asset management maturity assessment, going beyond existing frameworks and metrics, measuring asset management maturity to ensure profitable and sustainable rail operations.
- The correlation between asset management maturity and sustainability, understanding the critical role of mature asset management practices in achieving sustainability goals and aligning with global standards.

- Exploring the challenges of fragmented asset management practices within the rail industry, creating a holistic evaluation framework that aligns organizational processes and practices with industry benchmarks.
- The significance of benchmarking asset management practices across industries, implementing standardised models to visualize where organisations stand in their asset management journey in relation to their peers.
- Structured decision-making in rail asset management, the benefits of adopting a strategic approach in material management, resource allocation, and performance evaluation.

Kristijan Apostolski, EMEA Reliability and Asset Management Manager, JLL Work Dynamics

13:00 LUNCH NETWORKING BREAK

14:00 PANEL DISCUSSION Harnessing Predictive Maintenance for Enhanced Rail Operations: Unifying Data and Vision, Understanding the Cultural Shift Required to Embrace Predictive Maintenance and Instil Confidence in Machine Learning Technologies.

"If you want to do predictive maintenance, there are only three things, reactive maintenance, scheduled maintenance, our remaining useful life. So, if you have worked out what features or parameters for those three different processes, then you're in a good position if you're planning. But if you only plan for reactive, you might say a pity we didn't collect this other data, when we started reactive, because this didn't just switch on tomorrow and off you go, like you need data. And the data must be coming into the system, but it's just to plan it as a holistic approach, rather than dealing with one process."

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Marco Corradini, Railway Manager Expert, SBB CFF FFS

Claire Nicodeme, Engineer & Research Project Manager, SNCF

Paul Kootwijk, Data Lab Program Manager, ProRail

14:30 Wayside Train Monitoring, Optimising Asset Management and Safety to Avoid Damaged Assets Including Trains and Infrastructure

Together with NS we have made a road map for the development, testing and implementation of different monitoring tools. One of the examples is pantograph monitoring with Image Recognition and the roll out of intelligent video gates.

Paul Kootwijk, Data Lab Program Manager, ProRail

15:00 Wayside Monitoring and Sensors, The Possibility for Interaction Between Infrastructure and Vehicle's

Jan Bergstrand, Senior Strategic Analyst, Trafikverket

Mats Åkerfeldt, Nationell Planering, Trafikverket

ACHIEVING ORGANISATIONAL ALIGNMENT FOR EFFECTIVE RAIL ASSET MANAGEMENT

15:30 Remote Monitoring of Railways Assets for Project Scheduling

Marco Corradini, Railway Manager Expert, SBB CFF FFS

16:00 END OF CONFERENCE