Rail Infrastructure Asset Management Summit

6th September 2022, Hybrid Event, Central London

Integrating Intelligent Asset Management & Digital Twin to Advance Whole Life & Asset Lifecycle Management in Rail Operations

Using Digital Technologies to Reduce the Costs of Maintaining & Operating New & Existing Railways

Agenda - DAY1

8:30 Event Opening

8:50 Chair's Opening Remarks

PETER BOOM, *Director Rail Asset Management and Digitisation,* **Royal HaskoningDHV**

JOAO ROCHA, *Head of Asset Management & Maintenance,* ***East West Rail***

TAKING A HOLISTIC VIEW TO RAIL INFRASTRUCTURE MANAGEMENT, DEFINING PERFORMANCE FROM AN END CUSTOMER POINT OF VIEW, WHAT DOES THE CUSTOMER WANT?

The rail infrastructure in the UK is complex and comprises of a few different bodies. ORR are the health and safety regulator for the UK's mainline network. Periodic reviews are one of the principal mechanisms by which Office of Rail and Road holds Network Rail and HS1 to account and secures value for money for users and funders of the railway. In our review, we determined what must be delivered over a control period (5 years), the funding it required for this, and the incentives needed to encourage effective performance and delivery. This would feed through into the service that passengers and freight customers receive and, together with funders, ultimately pay for.

9:00 Integrating the Whole Rail System, Trains, Signaling, Power, Tracks, Screen Doors, Passenger Information Systems On-Board and in the Stations, Measuring Customer Satisfaction in Million Kilometers Between a Service Affecting Failure

- Introduction to the Office of Road and Rail
- The periodic review processes and how it ultimately impacts on customers experience.
- How might infrastructure owners, customers and funders have different desired outcomes?
- Uses of a consumer expert panel provide independent advice to help us fulfil our role as the railways' safety, economic consumer, and competition regulator.
- Our role in setting infrastructure asset management requirements and defining and reporting upon industry performance measures
- Our role in improving the passenger experience in areas such as compensation, retailing of train tickets and passenger accessibility.

STEVE DENNIS, *Head of Asset Management,* **ORR (Office of Rail and Road)**

9:20 Best Practice in Reintegrating New Assets and Renewals into Existing Asset Management Systems, Keeping Assets Records up to Date in Response to Renewals & Enhancement Projects

"Managing asset data and information about assets is a big deal. We're a big infrastructure, asset management company, we should have details of our assets and their inspection regimes, maintenance details and everything about them through to renewal, but we do change our assets, and I do still think there's a major challenge in when we do change assets, how quickly we can reintegrate that new asset into our existing systems."

Chief Systems Engineer, UK Infrastructure Owner

- How quickly can owners reintegrate new assets and renewals into existing asset management systems to improve operational processes and inspection regimes
- Working with suppliers to agree a standard format for the provision of project and asset records in a form that can be easily utilized by the asset owner
- Best practice on keeping assets records up to date in in response to renewals and enhancement projects to improve knowledge around scheduling asset inspections
- What new railway project management methodologies are owners introducing to reduce time & cost in new asset renewals and enhancement projects

LAWRENCE CHAPMAN, *Lead Digital Information Manager,* **HS2 (High Speed Two)**

MODERATOR: *JOAO ROCHA,* ***Head of Asset Management & Maintenance, East West Rail***

9:40 Audience Q&A

9:50 Future-Proofing Railway Infrastructure Asset Management with SAP

Building and maintaining rail infrastructure is an increasingly challenging endeavor due to global population growth, environmental impact, stakeholder requirements and activism and limited resources. Investment in infrastructure is likely to grow significantly soon to meet productivity and safety requirements. This session will explain how SAP can help you digitalise rail infrastructure asset management

JOHANN SCHACHTNER, *Industry Solution Manager, Industry Business Unit Travel and Transportation,* **SAP**
URS GEHRIG, *Head of SAP Enterprise Asset Management,* **SBB CFF FFS**

MODERATOR: *JOAO ROCHA,* ***Head of Asset Management & Maintenance, East West Rail***

10:20 Audience Q&A

10:30 Afternoon Networking Break

USING INTELLIGENT AND INTEGRATED ASSET MANAGEMENT ACROSS THE WHOLE ASSET LIFECYCLE TO REDUCE THE COSTS OF BUILDING NEW RAILWAYS AS WELL AS REDUCING THE COSTS OF MAINTAINING AND OPERATING EXISTING RAILWAYS

PANEL DISCUSSION

"We're publicly funded and so we need to be accountable for what's been spent and where it's been delivering the right benefit, but we also need the government or whoever is funding the railway to have confidence that our projections are accurate. So to plan your budget it is important to have a good asset management system and understanding of your asset so that you have confidence when you say bridges is whatever cost, it's going to be, that they have confidence that you are going to deliver at that cost and you know your accuracy and your costing models, you have that confidence in them, and you need to build that relationship so that they have an understanding that the railways can deliver."

Senior Track & Structures Engineer · Irish Infrastructure Owner

INTERACTIVE PANEL DISCUSSION

11:00 How Are Owners Using Technology to Demonstrate their Investment Regime is Functioning Well & Delivering the Intended Benefits, Understanding the Optimal Lifecycle for Each Asset?

- The importance of having a clear process map in rail organizations to reduce cost in operations, maintenance and to help guide your technology selection
- Using technology to forecast and model the impact and deliverables of investment in the network to optimize value and incentivize more spend in Rail
- What are owner and undertakers doing to ensure the lowest asset lifecycle costs and not just the lowest construction costs
- What asset management systems are owners implementing to better understand the life cycle of each individual asset to help planning and reduce cost through preventative measure
- How is the data from condition-based maintenance being integrated into existing asset management platforms to drive efficiencies in maintenance scheduling?
- New digital innovations to help railways manage their asset inventories, understanding the real-time health of your network

MARTIJN VAN NOORT, *Maintenance Management Expert, Lifecycle Management,* **ProRail**
JOÃO MORGADO, *Asset Information Manager,* **Infraestruturas de Portugal**
MARK NORRIS, Director – *Strategic Advisory Services, Asset Management & Reliability,* **The Institute of Asset Management**
TIM KERSLEY, *Head of Asset Management Strategy*, **Network Rail**

MODERATOR: *PETER BOOM, Director Rail Asset Management and Digitisation,* ***Royal HaskoningDHV***

12:10 Extended Audience Q&A

THE HOLY GRAIL OF DIGITAL TWIN: INTEGRATING THE DESIGN, BUILD, AND PERFORMANCE DIGITAL TWINS TO INCREASE EFFICIENCIES AND REDUCE COST IN RAIL OPERATIONS

"Digital twins in design, digital twins in build, digital twins in operations and maintenance or so-called performance digital twin, which you use in the operations and maintenance phase. There are a lot of examples, the holy grail is to align these three. So, start with a design digital twin, have it pass the data on to the build twin, which is more about asset configuration, then pass that data on to a performance twin, where you have your KPIs and your health status and your alarms. If you can align those three twins and avoid reinventing them from scratch each time but build on them as the project progresses"

Head of Digital Offerings, European Rail Systems Manufacturer

12:30 Design with a Focus on Quantity for the Planning of Infrastructure Projects, Classifying the 3D Design Process

- Starting with the fundamentals, understanding the key criteria for every new project, is it buildable and what is the optimal design
- What are owners doing to improve design with a focus on the quantity for the planning, quality of 3D designs and classifying the asset design process to eliminate the drawing production
- Using computer generated models to build and construct new railway assets, moving away from paper drawing to improve asset classification
- Examine how moving from drawing production to Model Driven Design can limit the cost for the contractors, eliminating additional project cost due to expensive design flaws and changes
- Using parametric design to change any design attribute whilst ensuring the change is automatically recalculated including the fabrication drawings in your digital twin

LÉA LOUCAS, *BIM Manager and Head of BIM and 2D Synthesis Unit,* **SNCF Réseau**

MODERATOR: *PETER BOOM, Director Rail Asset Management and Digitisation,* ***Royal HaskoningDHV***

13:00 Lunch Break

14:00 Intelligent Asset Management for Operations and Maintenance by Using Digital Twin of Railway System.

- Setting the requirements to make a digital twin of railway system for operation and maintenance sectors and making a skeleton of digital twin Using technology to capture your data in a digital format to make it easier to integrate 3D models and improve verification
- Architecture of infrastructure network's system digital twin
- Using technology to capture your data in a digital format to make it easier to fusion with the others format data
- Creating a data platform for the infrastructure actors to increase the frequency of infrastructure data from different sources
- Using a dashboard for data visualization in real-time infrastructure assets state
- Assigning a production catalogue for each component to increase efficiencies in maintenance processes using a performance digital twin

MOUSSA ISSA, *PhD Researcher,* **SNCF Réseau**
ABEL MARCIEL, *BIM and Digital Twin Lead,* ***East West Rail***

14:40 Applying New Standards for Railway Construction, Examine How Infrastructure Owners Are Applying the International Data Model for Digital Twin to Build a Brand-New Railway Line

- Best practice in using the international data model for digital twin to build a brand-new railway line to reduce cost in build, operations, and maintenance
- Optimal attributes required for each asset class to deliver a successful digital twin, setting up asset classifications, asset hierarchies and implementing system breakdown structures
- What new technologies and solutions are owners using to support new projects using the ISO international data model standards for digital twin
- What have been the challenges encountered in delivering projects thus far and do they outweigh the benefits?

MALCOLM TAYLOR, *Expert Advisor Digital*, **Crossrail International**

MODERATOR: *PETER BOOM, Director Rail Asset Management and Digitisation,* ***Royal HaskoningDHV***

15:00 Extended Audience Q&A

AUDIENCE ROUNDTABLE DISCUSSIONS

15:15 ROUNDTABLE 1- How Can Rail Support Net Zero to Reduce Carbon in New Railway Construction, Operations and Maintenance, Promoting Sustainability and Material Usability in Rail

---

"How can rail support net zero? So obviously, part of that is by modal shift, part of that will be by being more carbon efficient. So how do you move to materials with lower carbon? Synthetic sleepers for examples? They're all big hot topics now, a big focus on construction and specification, all those elements. I think people are now moving slowly moving to battery powered diggers, etc. and then concrete is obviously massive in terms of embedded carbon. So how can you get away reducing the carbon in concrete."

Chief Systems Engineer, UK Infrastructure Owner

- How can rail reduce the embodied carbon and use alternative sustainable materials
- Using BIM to visualize and record emissions from railway construction projects, impact of cutting trees, construction, and potential relocation of clean energy
- Integrating static data with dynamic data to improve carbon monitoring in engineering projects
- Reducing the cost of electrification schemes to deliver a greener source of power generation for trains
- Using sustainable materials in building and constructions that can be reused like steel in railway construction projects to increase sustainability
- Optimizing designs and modelling to understand the carbon in new railway construction projects
- What new technologies are owners using to identify the optimal worksite to reduce transportation of material, movement of equipment to and from work site
- Monitoring and tweaking traffic management system to reduce carbon in train operations

BAS BEEMSTERBOER, *EAM Evangelist,* **IFS**

15:15 ROUNDTABLE 2 - Building a Data Sharing Model Between Operators and Infrastructure Owners to Leverage More Data for Infrastructure and Train Maintenance

- Building the mechanisms to share data, trains monitoring infrastructure, infrastructure, monitoring trains

- Reducing the cost of infrastructure monitoring, using on-board equipment on trains to monitor the condition of the infrastructure to increase the frequency of monitoring and detects faults earlier
- Examples of cross industry collaboration jointly utilizing data by infrastructure managers and train operators, using on train borne data to improve infrastructure maintenance
- How can the industry improve on-board systems to digitize what the train driver sees so owners are able to, in event of lineside asset failure, assess the causes and identify the best intervention?

15:15 ROUNDTABLE 3 - Overcoming the Challenge of Creating a Harmonized Database with All Assets to Help Owners and Suppliers Exchange Asset Data Safely and Securely

- What are the challenges owners have in implementing digital technologies versus the challenges of the suppliers, collaboration on standard interfaces and sharing of critical data?
- Creating a central database to automatically manager the transfer of data from assets, data from the project to the maintenance team, increasing the lifecycle of assets
- Improving localization of assets on the network, using measurement trains and passenger trains with on-board sensors to identify and digitally classify more asset
- Building a team within the central data department to manage all data trends across the rail organization
- Upgrading obsolete asset management platforms, what new data platforms are operators using to manage their asset data

15:25 AUDIENCE ROUNDTABLE RESULTS PRESENTED BY GROUP MODERATORS

15:35 Afternoon Networking Break

IMPLEMENTING AN AGILE APPROACH TO IMPROVE INSPECTIONS, HOW DO OWNERS INNOVATE QUICKLY IN A REGULATED ENVIRONMENT TO ULTIMATELY ELIMINATE PHYSICAL INSPECTIONS

"we're on a journey, I suppose of improving our condition monitoring knowledge. Our systems that we've used historically has involved a lot of manual work, guys going out looking at inspections, I have a team of nine staff and that's what they do, they do the technical inspections on the asset checks and surveys, there's a lot of technological aids and benefits that are coming on stream that would help us get better records and help us do those inspections more efficiently and the net benefit is we have better asset information and knowledge as a result.."

Senior Track & Structures Engineer · Irish Infrastructure Owner

---

16:00 Moving the Paradigm from Condition Monitoring Being Seen as Something That Helps You Understand Asset Performance to Something That Helps Owners Understand Asset Safety

- Examine how infrastructure owner are using remote condition monitoring to replace cyclical maintenance, reducing cost in spare parts, and increasing performance in maintenance regimes
- Latest intelligent monitoring systems to reduce failures or degradation, Improving monitoring of the physical infrastructure, bridges, and earthworks
- Innovative low-cost video inspections systems for infrastructure monitoring, advances in ship to shore video in real time and potential benefits for track safety
- Delivering basic levels of automation to improve fault detection and reduce intervention

SIN SIN HSU, Regional Engineer - Track, **Network Rail**

MODERATOR: JOAO ROCHA, *Head of Asset Management & Maintenance*, **East West Rail**

16:20 Audience Q&A

16:30 How are Infrastructure Owners Using Digital Applications to Enhance and Assist with Rail Infrastructure Inspections, Improving Accuracy and Safety by Taking Boots Off Ballast

- How are owners using technology to forecast where to spend money, budgeting, planning, understanding the health of your assets
- Using innovative video solution on-board trains to improve frequency of network inspections and safety of workers, benefits of aerial imagery in inspections & surveys
- Drone and robotic inspections and potential for savings in safety and efficiency, solutions for accessing difficult to reach inspections like caves or riverbeds for scour management
- What other technology applications are owners using enhance to inspections and record keeping particularly, progressing inspections with the use of handheld technology

HERBERT FRIEDL, *Head of Department Asset Management in Civil Engineering*, **SBB Infrastruktur**
DIDIER VAN DE VELDE, *Manager Civil Engineering,* **Infrabel**

MODERATOR: JOAO ROCHA, *Head of Asset Management & Maintenance*, **East West Rail**

17:10 Audience Q&A

17:20 Building Asset Resilience, Remote Monitoring Capability to Assess the of Impact of Flooding and Landslip, Early Warning Systems for Climate Change

"So, I think potentially even things like weather conditioning monitoring, because one of the big threats to the rail network now is adverse weather conditions. We suddenly have a flash flood like we had in Stonehaven that caused the fatalities up there. It's can we send an alert there's been a flash problem in a particular area and therefore change the traffic conditions.

Lead Information Manager, UK High Speed Railway Line

- Weather conditioning monitoring, what systems are owners employing to improve preparedness for adverse weather conditions
- How can you use much more accurate weather forecasts to understand convective rainfall where it's going to impact and take measures accordingly
- What changes are owners making to Veg and tree cutting management to help mitigate some of the effects of climate change
- Implementing solutions to manage intense heat that can cause buckling of the rails and cause possible derailments
- Upgrading legacy drainage systems to new systems that handle larger volumes of rainfall to improve the reliability of operations

BRIAN HADDOCK, *Head of Seasonal and Weather Resilience,* **Network Rail**
PROF JOHN BECKFORD, *Visiting Professor, Department of Civil, Environmental and Geomatic Engineering,* **University *College London***

MODERATOR: *PETER BOOM, Director Rail Asset Management and Digitisation,* ***Royal HaskoningDHV***

17:50 Audience Q&A

18:00 Chair Closing Remarks

JOAO ROCHA, *Head of Asset Management & Maintenance*, **East West Rail**
PETER BOOM, *Director Rail Asset Management and Digitisation,* **Royal HaskoningDHV**

18:10 Networking Drinks Receptions

19:10 END OF SUMMIT