



Moving Europe towards a sustainable and safe railway system without frontiers.

RailDataForum\_28-04\_3B2\_pure

## **Agenda Rail Data Forum 2025**

The 2025 Rail Data Forum took place from 11 to 13 June in Cluj-Napoca, Romania.

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**All slides presented during the conference will be published in this page by the end of June.**

08:30 - 09:30

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## Registration & Welcome

09:30 - 12:00

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## Workshops

*Please choose between 1 Workshop and/or a Masterclass.*

### Workshop 1

#### Practical Data Consumption

Take your SPARQL skills to the next level in this advanced workshop designed for practitioners who already grasp the basics and are ready to explore the full power of querying RDF data. This session will focus on complex query patterns, complex optimization techniques, reasoning, and real-world scenarios using data from ERA Knowledge Graph.

Participants will engage in hands-on exercises to practice advanced features like property paths, subqueries, aggregates, and federated queries using ERA Knowledge graph endpoint. You'll also explore strategies and tips for query performance tuning, working with named graphs, reference data from other sources (e.g., Publications office endpoint).

Pre-requisite: knowledgeable of RDF or semantics or have registered previously to the master class on 'SPARQL for Beginners'.



Ghislain Atemezeng

ERA



Jerónimo Padilla

RailNetEurope



Luka Kalezić

RailNetEurope



Amine Chakir

SNCF Réseau - Route Compatibility Department

## Workshop 2

### **Railway Data Modelling**

This workshop will introduce participants to the principles and practices of data modelling and ontology engineering in the railway domain, supporting the development of interoperable, machine-readable data ecosystems aligned with EU digital rail initiatives. As the sector advances toward data-driven principles, semantic modelling becomes essential to represent complex railway infrastructures, positioning and location through the rail topology in a consistent manner. The railway infrastructure register will be an example to showcase how the micro-level was derived and integrated into the latest version of ERA ontology.

In this hands-on workshop, participants will explore the fundamentals of railway infrastructure data modelling using ontologies. This workshop will introduce how semantic technologies can be used to structure, integrate, and reason over complex railway infrastructure data.

By the end of this workshop, you'll be equipped to understand the key concepts and modelling choices of the ERA ontology, railway data in a way that is machine-readable, semantically rich, and ready for data-driven innovation in smart rail (infrastructure) systems.

No prior ontology experience required — just a curiosity for data, ontology and railway domain.



Dragos Patru

ERA



Mathias Vanden Auweele

MatData



Gerben Schut

ProRail

## Masterclasses

*Please choose between Workshops and Masterclasses.*

### Masterclass A

#### **Semantics for Beginners**

Step into the world of meaning-driven data with this beginner-friendly master class on semantics. This session demystifies the key concepts behind semantic technologies and how they power the modern web, intelligent systems, and knowledge graphs. You'll learn how semantics help structure and interconnect data in ways that machines can understand — going beyond keywords to concepts. Through interactive examples and visual explanations, we'll introduce foundational ideas like ontologies, vocabularies, Resource Description Framework (RDF), and the Semantic Web stack, all without requiring a technical background.



Pierre-Antoine Champin

W3C / Inria

### Masterclass B

#### **SPARQL for Beginners**

Dive into the world of the Semantic Web with this hands-on masterclass designed for beginners eager to learn SPARQL, the query language of RDF data. This session will guide you through the foundations of Linked Data and how to extract meaningful insights using SPARQL.

Participants will explore real-world datasets, learn the basic structure of SPARQL queries, understand RDF triples, and get comfortable querying public knowledge graphs such as ERA Knowledge Graph, Reference data at Publications Office.

No prior experience with SPARQL or Semantic Web technologies is required — just a curiosity for data and a desire to learn!



Vladimir Alexiev

GraphWise

### Masterclass C

## Data Transformation (RDFisation)

This master class offers a deep dive into the construction of RDF knowledge graphs using declarative mapping languages such as RML (RDF Mapping Language), YARRRML, and other W3C-aligned technologies. The session will emphasize on scalable, reusable, and maintainable methods for transforming heterogeneous data sources into linked, machine-readable RDF graphs. Participants will explore the full lifecycle of knowledge graph creation — from understanding source data structures (CSV, JSON, XML, relational databases) to writing and executing mappings that produce semantically rich RDF output. Through guided hands-on exercises and real-world examples, you will gain practical experience in aligning data with vocabularies and ontologies, and publishing it as Linked Data.



Ben De Meester

IDLab, imec - Ghent University

10:30 - 11:00

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### Coffee break

11:00 - 12:00

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[Vladimir Alexiev](#)

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[Ben De Meester](#)

[IDLab, imec - Ghent University](#)

## Lunch break

13:15 - 14:00

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### Opening: Keynote Speeches



Oana Gherghinescu

ERA



Ionuț-Cristian Săvoiu

Romanian Ministry of Transport and Infrastructure



Petru Bogdan

Romanian Railway Safety Authority (ASFR)



14:00 - 15:40

### Session 1: Digitalisation in the Railway Domain

**Towards a harmonised topology provision for RBC configuration with CCS TMS ERA ontology extension**



Ralph Müller

DB InfraGO

**Micro-Level modelling in ERA ontology**



Ghislain Atemezang

ERA

### **Infrastructure Managers as data innovators**



Rémi Collet

Infrabel



Linnea Olsen

Bane NOR



Shahrom Sohi

WU Vienna University of Economics and Business

### **Digitalisation as a game changer for the railways - Digital Capacity and Train Management**



15:40 - 16:10

#### **Coffee break**

16:10 - 17:50

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### **Session 2: Advancing digital ticketing**

#### **EU policy on rail ticketing & mobility platforms**



17:50 - 18:00



## **Day 1 Closure - Concluding words**



Chris Carr

ERA

18:00 - 19:30

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## **Cocktail reception**

08:30 - 09:00

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## **Welcome - Day 2 Opening**

09:00 - 10:30

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## **Session 3: Who needs Interoperable Data Anyway? Efficiency and practical implementation**

### **Service Function Diagnostics & Data Sharing**



Karl-Albrecht Klinge

Europe's Rail

### **Asset management - Connecting systems**



Matti Pesu

Finnish Transport Infrastructure Agency

## **Rail Data from Ontology to Daily Use - Best practices derived from European and Worldwide projects**



10:30 - 11:00

### **Coffee break**

11:00 - 12:30

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## **Session 4: The Future for Mobility Data in the European Union**

### **European Mobility Dataspace**



13:00 - 14:15

### **Lunch break**

14:15 - 16:00

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Ben De Meester

IDLab, imec - Ghent University

Masterclass D

#### **Telematics for Beginners**

This workshop offers a foundational overview of the European Union's Telematics Applications for Freight (TAF) and Telematics Applications for Passengers (TAP) Technical Specifications for Interoperability (TSI). The session will demystify how these specifications enhance data exchange and operational efficiency across European rail networks. The workshop will emphasize on

how standardised data exchange improves interoperability between different rail stakeholders.

**Duration 1h. Second part networking.**



16:00 - 16:30

**Coffee break**

16:30 - 18:15

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**Workshops**

*Please choose one Workshop*

Workshop 3

**The problem of positioning in railways - how can ontologies contribute to its solution**

The workshop will mainly deal with the generic concept for locating railway infrastructure in micro, meso and macro level of detail and additionally, ontology as a tool for validating and verifying this concept (e.g. for Railway infrastructure ...).

This workshop is addressed to interested parties that want to bring railway infrastructure description into digitalised standardised format using topology models (e.g., ERA ontology) and markup languages (e.g., railML).



Dr Larissa Zhuchyi

[railML.org](http://railML.org)



Workshop 4

## Data Validation

As data quality becomes mission-critical in digital ecosystems, this workshop focuses on how semantic technologies can be used to validate data effectively and declaratively. Participants will explore how RDF data can be validated using technologies like SHACL (Shapes Constraint Language) and SPIN, enabling consistency, compliance, and interoperability in knowledge graphs and Linked Data applications.

Through hands-on examples, this workshop will teach participants how to define constraints on data models, detect errors or inconsistencies, and integrate validation into data pipelines — all using semantic web standards.



Veronika Heimsbakk

Capgemini



José Emilio Labra

Universidad de Oviedo

## Workshop 5

### Linked Data supporting Vehicle Authorisation

This hands-on workshop explores how Linked Data and Semantic Web technologies can streamline and enhance the railway vehicle authorization process across borders and systems. Aimed at professionals in rail transport, regulatory bodies, and data engineering, the session focuses on applying RDF, ontologies, and Linked Data principles to model, share, and validate vehicle data in alignment with EU Rail interoperability regulatory frameworks.

Participants will learn how to represent key vehicle characteristics, compliance documentation, and authorization workflows using semantic models, improving data interoperability, traceability, and machine-readable compliance checks.



Maarten Duhoux

ERA



Philipp Wachsmuth

Siemens Mobility GmbH

## Workshop 6

### **Digitalisation of Driver/Signaller communication**

This workshop focuses on the digital transformation of Driver-Signaller communication in the railway sector, a critical area for enhancing safety, efficiency, and interoperability across rail networks. As part of broader efforts in railway digitalisation, the session explores how structured data, semantic technologies, and communication standards can modernise traditional voice-based exchanges.

Participants will examine how communication events can be digitised, modelled, and validated — enabling better traceability, automation, and integration with operational systems such as traffic management, safety reporting, and driver advisory platforms.



## Workshop 7

### **Dynamic digital timetable for rail services in the Union**

This workshop explores the vision, challenges, and technical enablers of implementing dynamic digital timetables for rail services across the European Union. As mobility becomes more data-driven and passenger expectations evolve, the rail sector must move to deliver a real-time, interoperable, and machine-readable timetables that support seamless journey planning, operational efficiency, and multimodal integration.

Participants will learn how semantic technologies, Linked Data, and European standards can support the creation, distribution, and querying of dynamic timetable information



— enhancing transparency and enabling innovation across national systems.



18:30 - 22:30

### **Networking dinner**

09:00 - 10:30

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### **Workshop feedback**

10:30 - 11:00

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### **Coffee break**

11:00 - 12:00

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### **Concluding remarks and Conference Closure**



Chris Carr

ERA

## **Related links**

- [Rail Data Forum 2025](#)



Cluj-Napoca, Romania

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