



Horizon 2020
European Union Funding
for Research & Innovation

Roadmaps for Artificial Intelligence integration in the rail Sector

PROJECT FINAL WORKSHOP

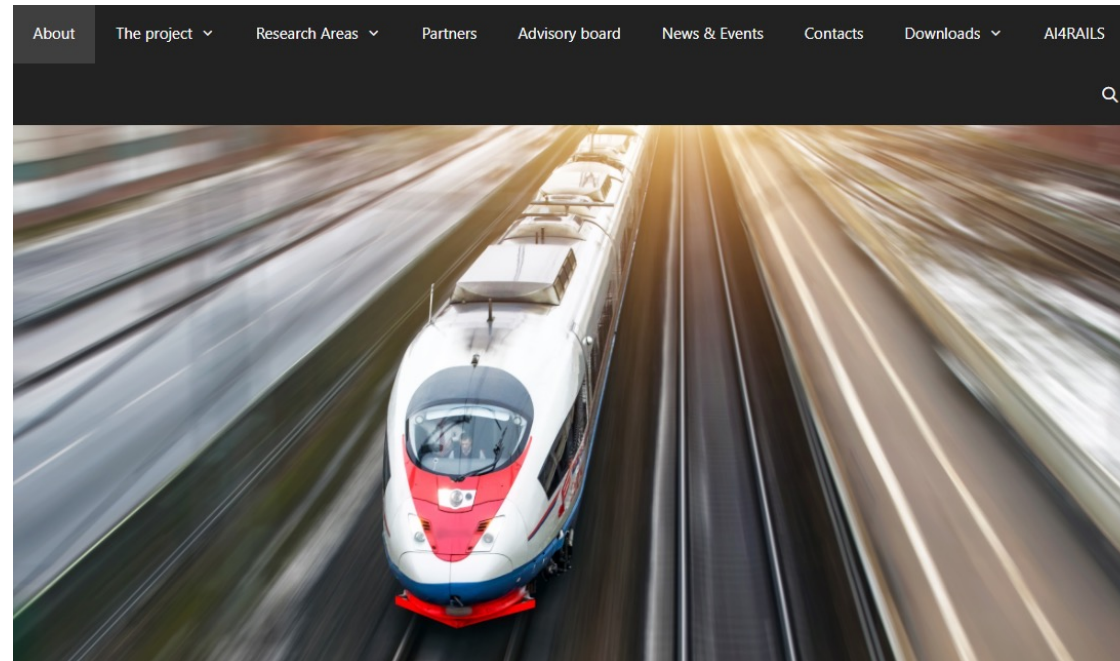
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RAILS

Roadmaps for AI integration in the rail Sector

<https://rails-project.eu/>



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Partners

ID	NAME	COUNTRY
1 CINI	CONSORZIO INTERUNIVERSITARIO NAZIONALE PER L'INFORMATICA (CINI) (Coordinator)	IT
2 UNIVLEEDS	UNIVERSITY OF LEEDS	UK
3 LNU	LINNAEUS UNIVERSITY	LNU
4 TU DELFT	DELFT UNIVERSITY OF TECHNOLOGY	NL



Advisory Board

European Union Agency for Railways (ERA)

Hitachi Rail STS

First Rail

Netherlands Railways

ProRAIL

Aitek S.p.A.

Comesvil S.p.A.

SYstems ENgineering for MAINTenance

Nexttechnologies Ltd.

The MathWorks

Main RAILS Objectives



Identification of the potential of AI for railways



Recognition of required innovation shifts



Development of methodological and experimental proof-of-concepts



Development of Benchmarks, Models and Simulations

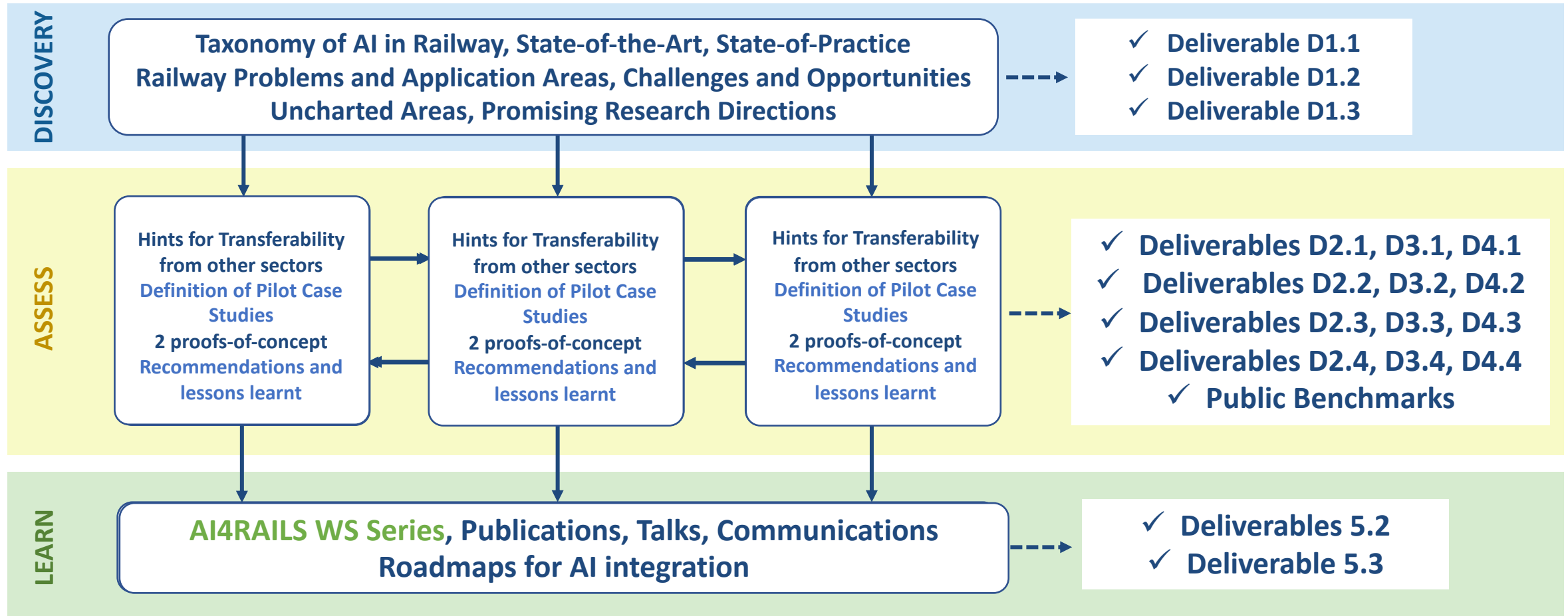


Involvement of relevant rail stakeholders



Training of young researchers and promotion of research networks on AI in railways

RAILS Scope, Research, Outcomes and Results



RAILS main (dissemination) activities



Events



KoM Meeting

(30/01/20)

1 AB Meeting

(01/03/2020)

Mid-Term Workshop

(25/02/22)

Final Workshop and Roadmapping Event

(30/05/24)



2 Organised Surveys

AI4RAILS workshop series:

2020 : co-located with EDCC2020

2021 : co-located with EURO2021

2022 : co-located with EDCC2022

2023 : co-located with ODS2023



Publications

13 among Scientific Papers,
Online Articles and Posters.

2 book chapters



Talks and Conferences

IEEE ITCS 2020

DisCoRail 2021

INFORMS 2021

InnoRail 2021

RSSRail 2022

WCRR 2022

Europe's Rail

Innovation Days 2022

Big Data 2022



More than 15
speeches
at national and
international events

1 Interview for
Global Railway Review



Benchmarks

2 Public Datasets

1 Student Challenge

Main Topics in Scientific Publications

- Intelligent Train Control
- Defect Detection through Deep Learning
- Digital Twins and AI (Preliminary Guideline and Reference Architecture)
- Reinforcement Learning Control for Virtual Coupling
- Deep Learning for Level Crossing Monitoring
- Review of public datasets for railways





Proofs-of-Concept

1. **Railway Obstacle Detection and Collision Avoidance;**
2. **Cooperative Driving for Virtual Coupling of Autonomous Trains;**
3. **Predictive Maintenance for Rolling Stock;**
4. **Smart Maintenance at Level Crossings;**
5. **Graph Embedding for Primary Delay Prediction;**
6. **Big Data on Incident Attribution Analysis.**

Expected by the end of July

ROADMAPS

Public Benchmarks

- [Vision-Based Obstacle Detection on Rail Tracks](#)
- [Level Crossing Warning Bell \(LCWB\) Dataset](#)

Available information from the Final Event



The presentations from the RAILS project and the recording of the Final Workshop will be made available on the RAILS website



The results of the real-time survey will be included in the roadmaps and provided in the last public technical deliverable

A blurred high-speed train with red and white livery is moving along a modern station platform. The platform has a white tiled floor and a glass and metal roof structure. The train is in motion, creating a sense of speed.

Call for Papers: Intelligent Train Control and Smart-Railways

- Springer Collection
- Submission deadline: 31 August 2023

AI4RAILS 2023

- The 4th International Workshop on “Artificial Intelligence for RAILwayS”
- [co-located with the International Conference on Optimization and Decision Science – ODS2023](#)
- September 4th, 2023
- Ischia, Italy





To explore the project and get updates:

- <https://rails-project.eu/>
- <https://www.researchgate.net/project/RAI-LS-Roadmaps-for-AI-integration-in-the-rail-Sector-EU-Horizon-2020-Shift2Rail-JU>

 RAILS S2R Project

 @project_rails

Thank you for your attention!

