PROJECT

Assets4Rail

Measuring, monitoring and data handling for railway assets; bridges, tunnels, tracks and safety systems

Funding: European (Horizon 2020)

Duration: Dec 2018 - May 2021

Status: Complete

Total project cost: €5,506,631

EU contribution: €4,710,167

Call for proposal: H2020-S2RJU-OC-2018

CORDIS RCN : 221879

Objectives:

Assets4Rail shares the Shift2Rail view of having an ageing European railway infrastructure that needs to cope with the expected increased traffics in the future. Likewise, reliable rolling stock will be required to crystallize the desired modal shift to rail. Both goals relay on a proactive and cost-effective maintenance and intervention system in the assets.

The overall objective of Assets4Rail is to contribute to the objective of IP3 of S2R which is to achieve cost efficient and reliable railway infrastructures. Assets4Rail aims to contribute to this modal shift by exploring, adapting and testing cutting-edge technologies for railway asset monitoring and maintenance. To achieve that, Assets4Rail follows a twofold approach, including infrastructure (tunnel, bridges, track geometry, and safety systems) and vehicles. To that aim, Assets4Rail is divided into 2 workstreams that have specific objectives.

In Workstream 1 Assets4Rail objective is to contribute improving the inspection, maintenance and upgrade methods for cost reduction and quality improvement of railway bridges and tunnels; it is also an objective the noise and vibration reduction in bridges.

In Workstream 2 Assets4Rail objective is to contribute to build a common measuring and monitoring data representation layer suitable to elaborate data coming from all source segments (onboard, wayside and remote), to correlate the different data and to obtain a holistic view of the railway system conditions.

- Novel improvements of hardware and software to monitor subsurface tunnel defects and distance (5m-30m) noise emissions monitoring for the integration into Asset specific Information Model (AIM).
- Improving information gathering and analysis for bridges and tunnels by developing a Building Information Modelling (BIM) platform to optimize inspection, maintenance, and upgrade costs.
- Development of an integrated method to assess fatigue on bridges components.
- Development and validation of noise dampers for bridges to reduce peak noise by approximately 5 dB and cleaning drainage pipes in long tunnels.
- Validate the models, algorithms, software, devices, prototypes, sensors and integrated systems by testing them in relevant environments.
- Analyse of the available and emerging alternatives for on-board technologies for measuring transversal position of the wheel in relation to the rail to support track geometry monitoring.
- Development of an integral autonomous and contactless wayside monitoring station to detect rolling stock failures.
- Planning and implementation of a data collection schemes for safety-critical systems.
- Validate the developed functional sub-systems and integrated prototypes by testing them in relevant environments

A dedicated information model (BIM) will be the keystone of the infrastructure part of the project. This model with integrated algorithms will gather and analyze the information collected by specific sensors which will monitor subsurface tunnel defects, fatigue consumption, noise and vibrations of bridges as well as track geometry. On the other hand, train monitoring will include the installation of track-side and

underframe imaging automated system to collect data for detecting specific types of defects that have non-negligible impacts on infrastructure. The additional use of the RFID technology will enable the smooth identification of trains and single elements, associated with the identified rolling stock failures.

The combination of mentioned real-time collected data with existing data along the implementation of deep learning techniques for assessing large data volumes will pave the way towards a cost-effective and proactive maintenance process of infrastructure and rolling stock. In addition, two innovative intervention methods, noise rail dampers and the cleaning of long tunnel drainage pipes, will be validated on field.

Assets4Rail will benefit from a strong multidisciplinary consortium committed to concrete exploitation activities aligned towards the achievement of the challenging project objectives.

Parent Programmes:
H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Other programmes: S2R-OC-IP3-01-2018 - Measuring and monitoring devices for railway assets

Lead Organisation:

Fundacio Eurecat

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EU Contribution: €189,744

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EU Contribution: €342,444

Technologies:

Infrastructure management
Decision Support Tools for infrastructure management

Development phase: Research/Invention

STRIA Roadmaps: Infrastructure

Transport mode: Rail transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Safety/Security

Geo-spatial type: Network corridors