Press Release
Vienna, 26 January 2021

MAKING THE MOST OF THE LIFE CYCLE OF RAILROAD BRIDGES
Within the scope of DEEB-INFRA, the condition assessment of infrastructure for railroad lines is to be significantly improved. AIT is key partner of an international consortium.

Vienna (AIT). The research project DEEB-INFRA (Data-based Extrapolation Model for the Determination of Real Operational Load Trains for Residual Life Analysis of Railway Infrastructure Assets) was recently launched: Over the next three years, a German-Austrian consortium led by Darmstadt University of Technology will be researching an optimized method for assessing the condition of railroad infrastructures such as bridges, tunnel structures or noise barriers. The AIT Austrian Institute of Technology and REVOTEC are part of the top-class consortium as Austrian partners. AIT is particularly involved in the development of an extrapolation method for data from axle load measurement points as well as a new method for the acquisition of axle load measurement data with fast and easy-to-apply sensors in the network of the project partner Deutsche Bahn AG. DEEB-INFRA is funded with a total of 980.000€ by the German Federal Ministry of Transport and Digital Infrastructure (BMVI) as part of the Modernity Fund (mFUND) funding initiative.

Structural monitoring using current data for specific lifetime prognosis
To determine the remaining service life of existing bridges, idealized load models of the past and assumptions about future traffic volumes are used. However, these assumptions are subject to large uncertainties and therefore, usually have a strongly conservative character. The potential service life of a certain structure until it has to be repaired is thus not fully exploited.

In addition to classic structural monitoring facilities, the European rail network also has numerous measuring points for monitoring maximum axle loads and determining wheel out-of-roundness. In smaller countries in particular, such as the Netherlands, Switzerland and Austria, these axle load measuring points have already been installed throughout the country. The data obtained this way can currently not be used to determine the remaining service life of the built rail infrastructure. However, with the knowledge of the real train loads, statements on bridge aging concerning maintenance could be significantly improved.

This is where DEEB-INFRA comes in: Within the scope of the project, work is being done by using data already collected at existing axle load measuring points in the European railroad network for the service life analysis and maintenance planning of infrastructure facilities, in particular of bridge structures. The aim is to optimise the timing of any necessary strengthening measures or new construction and to better control inspection intervals. This could result in considerable cost savings for the operator and at the same time, increase the availability of the network.

Significant contribution to a resilient and sustainable infrastructure

The holistic evaluation of axle load measurement data from several European countries allows the calibration of the measurement systems to each other as well as the harmonization of data quality in a European context. In addition, a statistically based area-wide transferability of the results to structures and lines not equipped with sensors yet is made possible.

The information obtained this way can make a significant contribution to a safe and resilient railroad infrastructure, explains Alois Vorwagner, Thematic Coordinator for Structural Dynamics & Life Cycle Engineering at the AIT Austrian Insitute of Technology: "The extrapolation model co-developed by AIT is the basis for refining the measurement data and thus the basis for innovative asset management." As a result, the project operators expect an extension of the remaining service life of existing bridge structures by up to 20% compared to the current conservative approach. "This means significantly improved availability of the infrastructure while saving resources - entirely in the sense of a sustainable, future-proof transportation infrastructure," explains Vorwagner.

The DEEB-INFRA project consortium

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AIT Austrian Institute of Technology, Vienna
REVOTEC zt gmbH, Vienna
Deutsche Bahn AG - DB Training Learning & Consulting, Frankfurt am Main

About the mFUND of the BMVI

As part of the mFUND research initiative, the German Federal Ministry of Transport and Digital Infrastructure (BMVI) has been funding research and development projects related to data-based digital applications for Mobility 4.0 since 2016. In addition to financial support, mFUND also supports networking between stakeholders from politics, industry and research with various event formats and access to the mCLOUD data portal. For more information, visit www.mfund.de.

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