



# Review of the current state of standardisation on monitoring, data-informed safety assessment and decision-making regarding maintenance of the transport infrastructure

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## Abstract

Road and railway infrastructure networks form the backbone of European transportation systems, carrying more than 80% of passenger and 50% of goods transport in Europe. Bridges and tunnels which are critical elements of the transport infrastructure networks, have in many cases reached their design service life and keep ageing, with the maintenance needs constantly increasing. Besides, transport infrastructure currently carry significantly more traffic loads than what it has been originally designed for and the topology of traffic keeps changing e.g. due to introduction of platooning or autonomous vehicles. Such conditions bring safety risks to bridges and tunnels. In the last two decades there have been nearly 30 major failures of road and railway bridges and tunnels in Europe, with hundreds of people killed and injured. At the same time, resources and capacity for conservation and care are too limited and should be used in an optimised way to counteract the growing backlog of maintenance. There is a strong conviction that use of novel technologies for condition survey may aid the task of managing the safety risks to transport infrastructure. Despite increasing amount of good practise, uniform approach to data-informed safety and risk assessment, and maintenance decision-making is however missing.

This contribution presents the review of the current state of standardisation on monitoring, data-informed safety assessment and maintenance policies of bridges and tunnels in the European countries. This forms an essential step in the development and implementation of harmonised standards across Europe, which is believed to be a key strategy to increase the safety level of the transport infrastructure.

**Keywords:** standardisation, bridges, tunnels, monitoring, data-informed safety assessment, maintenance.

## 1 Introduction

Bridges, tunnels and other large infrastructures on are the most vulnerable elements of the road and railway networks. Due to insufficient quality control during construction, progressive ageing

and deterioration of materials, high traffic loads, and additional risks originating from climate change or man-made hazards, an increase of the safety risks seems inevitable. On top of that, weak diagnostics of structures, suboptimal maintenance strategies and deficiency in execution of