

Assessing the Resilience of Bridges on the Ten-T Network to Natural Hazards

The reliability of the European TEN-T road network is highly dependent on the serviceability of the bridges and other critical infrastructure (CI) elements on the network. The occurrence of a disaster resulting from a natural hazard, such as an earthquake, can dramatically affect the serviceability of the network if the CI elements are not sufficiently resilient to withstand these extreme loads. In order to maximize the resilience of the European road network to such events it is imperative that an efficient and reliable system is in place to manage the bridges and other road infrastructure elements, allowing the most critical elements to be prioritised for repair or maintenance as required. Central to such a system is the ability to identify the critical elements on the network and to estimate the probable direct and indirect consequences over time due to one or more hazards.

As part of the INFRARISK project a methodology for carrying out reliable stress tests for the European road network is being developed. The approach will support the assessment of CI failure risk due to multiple hazards. The developed methodology is being applied to particular case study regions and this paper presents the application of the approach to a portion of the Ten-T road Network in the vicinity of Bologna in Italy. This will provide an overview of the resilience of the bridges and other structures on the network to high intensity earthquakes while also indicating the potential financial costs and disruptions to travel times along the network.

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Key words

Bridge Management; Infrastructure; Earthquake; Risk; Natural Hazard;