

## Review and Classification of the Indicators and Trends Used in Bridge Performance Modeling

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**Abstract :** Bridges, as an essential part of road infrastructures, are affected by various deterioration mechanisms over time due to the changes in their performance. As changes in performance can have many negative impacts on society, it is essential to be able to evaluate and measure the performance of bridges throughout their life. This evaluation includes the development or the choice of the appropriate performance indicators, which, in turn, are measured based on the selection of appropriate models for the existing deterioration mechanism. The purpose of this article is a statistical study of indicators and deterioration mechanisms of bridges in order to discover further research capacities in bridges performance assessment. For this purpose, some of the most common indicators of bridge performance, including reliability, risk, vulnerability, robustness, and resilience, were selected. The researches performed on each index based on the desired deterioration mechanisms and hazards were comprehensively reviewed. In addition, the formulation of the indicators and their relationship with each other were studied. The research conducted on the mentioned indicators were classified from the point of view of deterministic or probabilistic method, the level of study (element level, object level, etc.), and the type of hazard and the deterioration mechanism of interest. For each of the indicators, a number of challenges and recommendations were presented according to the review of previous studies.

**Keywords :** bridge, deterioration mechanism, lifecycle, performance indicator

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