

VERIFYING RISK-BASED INSPECTION INTERVALS BASED ON HISTORICAL RECORDS AND STATISTICAL ANALYSIS OF BRIDGE FILES

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ABSTRACT

The periodic inspection of highway bridges in the United States plays a critical role in ensuring the safety, serviceability, and reliability of bridges. A new risk-based inspection (RBI) framework was developed in the Phase I of the NCHRP 12-82 project in order to determine bridge inspection intervals. This research was conducted to demonstrate the implementation of the methodology and to verify the effectiveness of RBI analysis for determining suitable inspection intervals for highway bridges. A new methodology was developed by integrating statistical analysis and backcasting process for two case studies in Texas and Oregon. The objective of the statistical models was to develop a simple, rational method that is data-based to quantify the risk in order to support decisions regarding the appropriate bridge inspection intervals. The objectives of the case studies were to demonstrate the implementation of the methodologies with state DOT personnel and verify the effectiveness of RBI analysis in determining suitable inspection intervals for typical highway bridges. The verification of the methodology was analyzed by developing a new backcasting procedure that compared historical inspection records with the results of RBI analysis. The results of the research demonstrated and verified that inspection intervals of up to 72 months were suitable for certain bridges. Such extended inspection intervals would allow for the reallocation of inspection resources toward bridges which require more frequent and in-depth inspections, resulting in improved safety and reliability of bridges.