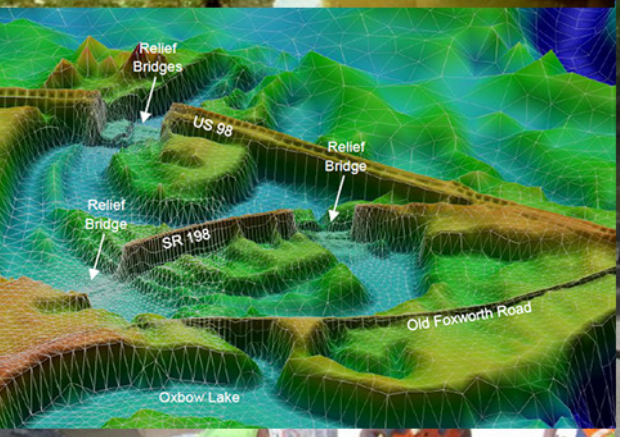

SCAN TEAM REPORT

NCHRP Project 20 68A, Scan 15-02

Bridge Scour Risk Management

Supported by the

National Cooperative Highway Research Program

Executive Summary

Flooding and scour are recognized by the bridge community as the leading cause of bridge failures in the United States. About 83% of the structures listed in the National Bridge Inventory (NBI) cross waterways and are exposed to the threats of flooding and scour. Agencies responsible for bridge safety seek effective threat-mitigation strategies, including installation of scour countermeasures to monitor, control, inhibit, change, delay, or minimize stream instability and bridge-scour susceptibility. Additionally, many states are developing innovative approaches for assessment of structural vulnerability and bridge scour susceptibility; however, the practices differ from state to state. Thus, there is a need to better understand the current state-of-practice in different states and to identify and document successful approaches to reducing bridge-scour risks through the appropriate use of countermeasures.

This scan's goal was to gather current practices from different states, identify best practices, and propose an implementation plan to improve the consistency in applying bridge-scour risk management. This scan's goal was achieved in three stages:

- A desk scan (see Chapter 2)
- A comprehensive questionnaire with amplifying questions for various related topics (See **Appendix A** for the questionnaire and **Appendix B** for a summary of the responses.)
- A workshop with representatives from various states (see **Appendix C**)

In the desk scan, a detailed literature review was conducted regarding scour assessment and countermeasure practices and new developments in these practices. Based on various sources of information, the scan team identified topics that are essential for understanding bridge-scour risk management:

- General Procedures and Risk Analysis
- Scour Modeling and Analysis
- Monitoring and Field Inspection of Scour critical bridges
- Design, Construction, and Sustainability of Countermeasures
- Plan of Action

Various departments of transportation (DOTs) were contacted to collect the information regarding bridge scour assessment and mitigation. The desk scan showed that many DOTs can provide meaningful information on bridge scour assessment and countermeasure processes and practices. However, due to time constraints, a limited number of DOTs were selected for follow-up and further investigation. During the organizational meeting and based on input from the literature review and discussions with the scan team members, the scan team selected 17 states for participation: California, Colorado, Florida, Idaho, Iowa, Louisiana, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, Pennsylvania, Tennessee, Texas, Utah, and Wisconsin.

A comprehensive questionnaire of amplifying questions covering various topics was distributed to the selected states (see **Appendix A**); the responses to the questionnaire were compiled and are summarized in Appendix B. Fourteen states made technical presentations during the workshop (see Appendix C), which was held to identify the best practices and propose an implementation plan for the future.

The findings of this scan provided a better understanding of the current state-of-practice for bridge scour risk management and identified best practices. Based on the findings, the scan team made recommendations and proposed an implementation plan to improve scour assessments and countermeasures. These findings, conclusions, and recommendation are summarized in this report.