



RESEARCH PROJECT CAPSULE [18-5ST]

July 2018

TECHNOLOGY TRANSFER PROGRAM

Investigating Available State-of-the-Art Technology for Determining Needed Information for Bridge Rating Strategies

JUST THE FACTS:

Start Date:
May 14, 2018

Duration:
12 months

End Date:
May 13, 2019

Funding:
SPR: TT-Fed/TT-Reg

Principal Investigator:
Robert F. Lindyberg, Ph.D., P.E.
Senior Vice President
FDH Infrastructure Services

Administrative Contact:
Tyson Rupnow, Ph.D., P.E.
Associate Director, Research
225-767-9124

Technical Contact:
Walid Alaywan, Ph.D., P.E.
Sr. Structures Research Engineer
225-767-9106

Louisiana Transportation
Research Center
4101 Gourrier Ave
Baton Rouge, LA 70808

Sponsored jointly by the Louisiana
Department of Transportation and
Development and Louisiana State
University

POINTS OF INTEREST:

Problem Addressed / Objective of
Research / Methodology Used
Implementation Potential

WWW.LTRC.LSU.EDU

PROBLEM

The Louisiana Department of Transportation and Development (DOTD) has hundreds of bridges with missing or incomplete as-built plans. The unavailability of needed information prevents bridge raters from performing appropriate calculations for determining a bridge's ability to carry specified loads.

OBJECTIVE

This research will investigate technologies that can be used for determining bridge information that is not available in design or construction records. Examples include items related to bridge geometry (length, width, member dimensions); strength of bridge materials (concrete, steel); and locations of reinforcement.

METHODOLOGY

A complete literature review will be performed to evaluate the steps and parameters needed for bridge load rating. In general and simplest terms, four key steps are followed when conducting a bridge load rating: (1) material properties and member dimensions are identified; (2) bridge dead load is determined; (3) applied loads are compared with member capacities; (4) and the bridge rating factor is calculated.

Nondestructive evaluation (NDE) methods offer the best means to safely and economically evaluate missing bridge data. In this research, all NDE methods applicable to measurement of parameters required for bridge rating will be studied in depth and summarized with discussion regarding principle technology, operation procedures, uncertainty, accuracy, advantages, limitations, and costs. Figures 1 and 2 show tools that could be used in NDE methods.

IMPLEMENTATION POTENTIAL

This research will enhance the effectiveness of the DOTD bridge management program by providing practical tools for obtaining missing information needed for proper load rating of bridges.



Figure 1 (left):
FDH rapid bridge
deck scanning



Figure 2 (bottom):
FDH operator
performing UT
measurements