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Alternative Solutions to Meet the Service Needs of Low Volume Bridges in Iowa

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8. ABSTRACT

There is a nationwide need for a safe, efficient and cost effective transportation system. An essential component of this system is the bridges. Local agencies perhaps have an even greater challenge than federal and state agencies in maintaining the low volume road (LVR) bridge system due to lack of sufficient resources and funding. The primary focus of this study was to review the various aspects of off-system bridge design, rehabilitation, and replacement. The source of information included both Iowa and national agencies. This report is intended to be a "user manual" or "tool box" of information, procedures and choices for county engineers to employ in the management of their bridge inventory plus identify areas and problems that need to be researched.

To obtain pertinent published information, past Iowa Highway Research Board (HRB) projects were identified and reviewed. In addition, literature reviews were performed to identify pertinent information related to LVR bridge design, rehabilitation/strengthening and replacement.

A questionnaire was sent to all Iowa county engineers to determine the various problems that are encountered on LVR and their solutions to these problems. Fifty-two Iowa counties responded to the survey. A large percentage of the respondents indicated that they use in-house crews for bridge replacement or rehabilitation. A large part of the in-house work uses steel stringers and wood decks. Approximately one-half of the respondents indicated that they have experience with strengthening superstructure and substructure bridge elements, although adding piling to the substructure was the most common response.

A questionnaire was also sent to State DOT's, County and Local bridge owners and consultants involved with off-system bridge design and rehabilitation in other states. The responses to the questionnaire included a total of 20 states and 70 local agencies nationally. One significant finding is that more appropriate decisions are required in all areas of bridge maintenance, rehabilitation, and replacement. "Data based" decisions through asset/bridge management as well as construction techniques, maintenance procedures, materials, etc. to promote extended life are required. New high performance materials as well as fiber reinforced polymer (FRP) products are currently being researched.

A list of research needs was developed, based on the evaluation of the information obtained from this study [i.e. comparing current state-of-the-art with existing problems], input from a research needs forum meeting held last year, and conversations with several county engineers. The research needs list will form the basis of a work plan for developing solutions to current LVR bridge problems.

9. KEY WORDS

structures, bridges, low volume roads, service needs, rehabilitation

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