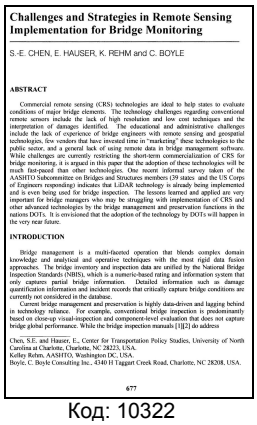

Challenges and Strategies in Remote Sensing Implementation for Bridge Monitoring

S.-E. CHEN, E. HAUSER, K. REHM and C. BOYLE

ABSTRACT

Commercial remote sensing (CRS) technologies are ideal to help states to evaluate conditions of major bridge elements. The technology challenges regarding conventional remote sensors include the lack of high resolution and low cost techniques and the interpretation of damages identified. The educational and administrative challenges include the lack of experience of bridge engineers with remote sensing and geospatial technologies, few vendors that have invested time in "marketing" these technologies to the public sector, and a general lack of using remote data in bridge management software. While challenges are currently restricting the short-term commercialization of CRS for bridge monitoring, it is argued in this paper that the adoption of these technologies will be much fast-paced than other technologies. One recent informal survey taken of the AASHTO Subcommittee on Bridges and Structures members (39 states and the US Corps of Engineers responding) indicates that LiDAR technology is already being implemented and is even being used for bridge inspection. The lessons learned and applied are very important for bridge managers who may be struggling with implementation of CRS and other advanced technologies by the bridge management and preservation functions in the nations DOTs. It is envisioned that the adoption of the technology by DOTs will happen in the very near future.

INTRODUCTION

Bridge management is a multi-faceted operation that blends complex domain knowledge and analytical and operative techniques with the most rigid data fusion approaches. The bridge inventory and inspection data are unified by the National Bridge Inspection Standards (NBIS), which is a numeric-based rating and information system that only captures partial bridge information. Detailed information such as damage quantification information and incident records that critically capture bridge conditions are currently not considered in the database.

Current bridge management and preservation is highly data-driven and lagging behind in technology reliance. For example, conventional bridge inspection is predominantly based on close-up visual-inspection and component-level evaluation that does not capture bridge global performance. While the bridge inspection manuals [1][2] do address

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677

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Ключевые слова:

Содержание.