Development strategies for a web-based bridge maintenance management system

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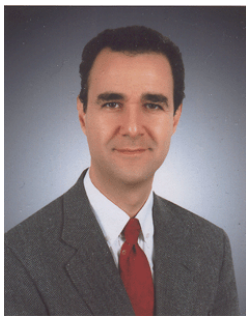

Dr. Ferhat Akgül, born in 1965, received his Civil Engineering degrees of BS from the Middle East Technical University, MS from the Univ. of New Mexico, USA and Ph.D from the Univ. of Colorado at Boulder, USA. Dr. Akgül's current research interests are in Structural Reliability, Bridge Management Systems and Life Cycle Cost Engineering.

Summary

This paper describes a project undertaken in Turkey to develop a web-based, country-wide bridge management system by gathering the scientific research and technical knowledge in this field, and by enhancing it with additional research considering the criteria and practices that are specific to the country. It is intended to develop a Bridge Management System that will be continually used by the General Directorate of Highways to manage 5486 bridges it owns as of 2006. The project aims to build a planning and maintenance reporting system that will be used by both the General Directorate and by its seventeen districts. The developed system will enable the General Directorate to monitor the safety and the maintenance costs of the bridges it owns and to be able to provide justifications, supported by administrative reports based on scientific and technical data, to higher authorities at the time when the maintenance budget for the upcoming year is being prepared.

Keywords: bridges, management, maintenance, performance, lifetime, deterioration.

1. Introduction

The decisions in various countries regarding the maintenance, repair and replacement of bridges are nowadays being made using computer programs built on databases and bridge engineering research and practices. The computer programs developed for this purpose, the so called Bridge Management Systems (BMS), may form a part of an overall infrastructure management system. In the past, substantial amount of research has been performed on this subject and the research in this field is continuing extensively. In 2001, the BRIME project presented the guidelines and recommendations for a possible European bridge management system. A major function of a Bridge Management System is to assist the administration, which is in charge of maintenance and management of the bridges, to determine the most suitable times for applying the repair and improvement actions for the bridges considering the available limited budgets and resources of the administration. By utilizing a Bridge Management System, it is possible to ensure the safety of the bridges throughout their lifetimes, to avoid the accumulation of maintenance and repair needs of a large group of bridges in the future, and to prevent the inadequate maintenance and repair actions to reach to a critical level which may endanger the structural strength and safety of the bridges.

This paper describes a project undertaken in Türkiye to develop a web-based, country-wide bridge management system by gathering the scientific research and technical knowledge in this field, and by enhancing it with additional research considering the criteria and practices that are specific to the country. It is intended to develop a Bridge Management System that will be continually used by the General Directorate of Highways to manage over 5000 bridges it owns. The production of the end product requires substantial amount of research and development. During the development phase of the Bridge Management System, it is intended to review the scientific literature in numerous fields and to integrate the existing concepts into the developed system. In addition to the tools to be developed, the project aims to build a planning and maintenance reporting system that will be used by both the General Directorate and by its seventeen districts. The developed system will enable the General Directorate to monitor the safety and the maintenance costs of the bridges it owns and to be

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