



Evaluation method of bridge performance for new bridge asset management considering renewal of existed bridges

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Abstract

In order to maintain the expressway bridge assets based on minimum LCC principle, Hanshin expressway has been developed a bridge management system (H-BMS: Hanshin expressway Bridge Management System) with an estimation system module of bridge condition state by integrated inspection data and a policy making module predicting maintenance budget, repair priority, etc. With the increase of aging structure, the H-BMS should be improved to take into account of drastic large-scale renewal policy from the long term point of view. This paper shows the methodology for calculating performance based soundness indicator as a basic analysis toward development of the new H-BMS.

Keywords: H-BMS, Bridge management system, large scale renewal, performance based soundness indicator

1 Introduction

The Hanshin Expressway is a network of expressway with a total length of about 260km. It started in 1964 initially with 2,3km and after about 40 years, carries an average of about 900 thousand vehicles a day at present. Over 80% of its total length is overhead structures, and 83,3km length of road network in Osaka and Kobe area is over 40 years after construction. These aging structures will increase in the future. The large scale repair and renewal is necessary for Hanshin expressway to maintain its service level for next 100 years.

The Hanshin Expressway has developed a bridge management system (H-BMS) from 2002, in order to estimate long-term repair costs and extracting

damage necessary for short-term repair activities, based on the stochastic deterioration model derived from visual inspection data [1].

This BMS supposes that structures of the Hanshin expressway can be used permanently without renewal. But, with the increase of aging structure, it would be very hard to maintain road service level without large-scale repair or renewal.

This paper shows the methodology for calculating soundness indicator which can evaluate structural performance as a basic analysis toward development of the new H-BMS which can evaluate large-scale repair and renewal policy. First, this paper reviews existing H-BMS and second, shows the methodology of calculating new soundness indicator, and the result of empirical study.