



Bridge performance and tendering based on Life Cycle Costs

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Abstract

When tendering infrastructure assets it is generally required that, they shall be safe, cost optimal, reliable, provide optimal availability to all stakeholders and easy to operate and maintain. Minimizing construction cost has always been one of the main reasons for tendering of infrastructure assets. However, during the last decade's attention towards operation and maintenance (O&M) costs has increased. This calls for Life Cycle Cost (LCC) studies. In order to perform LCC studies, we need to learn from the actual performance of the present bridge stock. This is investigated through a follow up of a project on the E4 highway in Sweden. Functional requirements in a tender document addresses requirements to the performance of components but it is the authors experience that this may not always be sufficient in order to obtain optimal LCC. This paper also highlight a number of important questions that has to be considered if LCC are considered as part of the tender process.

Keywords: Life Cycle Costs; Life expectancy; Quality; Bridge.

1 Introduction

Bridge performance can be defined as how a bridge has performed to date when compared it to the original design expectations and demands. These initial performance requirements can be demands such as load bearing capacity, durability/service life, safety and availability. These requirements and demands may however change with time, as needs and technology evolves.

Many countries have developed a national Bridge Management System (BMS), with the goal to have an overall picture of the nation's bridge stock as well as individual structures actual condition. At the heart of any cost-effective modern BMS lies, the information entered into the System

databases. This information should be based on regular and systematic inspections performed on the existing bridge stock. The information stored in these databases can be used effectively in the future to better predict the development of certain type of damages under certain circumstances. This performance prediction can be done on several levels, from micro-level, a certain structural element on a particular bridge to the macro-level, the entire road network of a nation. To achieve reliable performance models, much data is needed.

Many BMS have even registered performed O,M&R works on the bridges in the past and built-in planning modules for future works in terms of time perspective, costs and prioritisations.