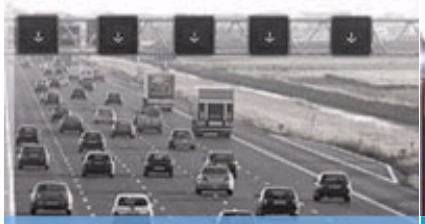

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Life cycle cost analysis for managing rail infrastructure

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Full text pdf

Abstract

n the last decade managing railway infrastructure in Europe has changed compared to the century preceding it. Due to the restructuring of railways, which has resulted in separate Infrastructure Management and increasing performance demands from governments and Transport Operating Companies, infrastructure performance has become an important issue. Reliability requirements, budget limits, and operational conditions, such as the time available for maintenance, are becoming increasingly strict.

As a response Infrastructure Managers (IMs) have started to develop computer-based tools for a quantitative analysis of the (long-term) impacts of design and maintenance decisions. These tools should enable IMs to systematically optimise and underpin their budget needs, minimise the total costs for a required performance level, and guarantee the infrastructure quality in the long run. Although progress has been made over the last years, these tools are still in an early phase of development, and have not yet been successfully implemented in the design and maintenance management processes.

In this paper an approach based on Life Cycle Costing has been developed, which is able to support decision-making on design and maintenance quantitatively, even in absence of sophisticated maintenance planning tools, using expert judgement beside empirical data. Key to the approach is a decision support system (DSS) for analysing the long-term impacts of design and maintenance decisions on reliability, availability and cost of ownership.

The DSS combines data from different management areas, such as construction, maintenance, financing and transport operations, in order to make estimates of the life cycle costs. Infrastructure availability and reliability are included in the analysis of life cycle costs, as they have an impact on the costs and revenues of transport operations.

The DSS concept and its application during the tender for the Dutch High-Speed Line are presented. Both results and obstacles are discussed. Especially in a design phase a lot of uncertainty is involved in the analysis. The DSS proves to be a valuable tool for testing the robustness of design and maintenance decisions and for focusing the discussion on the important cost-driving factors.

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