Framework for Railway Phase-based Planning

In the railway field, planning the maintenance and renewal strategy from Life Cycle Cost (LCC) perspective gets more and more attentions recent years. The new approach looks at all the costs through the infrastructure life span and use the annuity (continuing payment with a fixed total annual spending) to evaluate the project alternatives. The comparison result can identify the most cost-efficient solution in a long run and therefore reduce the overall costs.

This article defines a phase-based framework to guide the railway maintenance and renewal project planning at strategic level. The framework evaluates the project options from a larger LCC scope: The costs from train operation companies and passengers, together with the maintenance and renewal costs from Infrastructure Managers are included in the calculation.

The framework simplifies the planning processes and the LCC calculation into 7 phases. By going through the phases, the project's key evaluation indicators such as track quality and life time, the LCC annuity, Cash flow and Cumulated NPV curve over years, can be visualized into charts, so that the maintenance and renewal alternative proposals can be easily illustrated and compared.

A case study is introduced in the article to demonstrate how the framework works to compare timber sleepers and concrete sleepers from strategic planning level. Two Life Cycle Cost oriented policies are discussed to illustrate: high quality track is necessity to improve the cost efficiency of railway maintenance and renewals.

General information
Publication status: Published
Organisations: Department of Transport, Traffic modelling and planning
Contributors: Li, R., Landex, A., Nielsen, O. A.
Number of pages: 14
Publication date: 2013
Peer-reviewed: Yes
Keywords: Railway planning, Life Cycle Cost, Framework, Phase Based Planning, Decision Support System
Source: dtu
Source-ID: u::9500
Research output: Contribution to conference › Paper – Annual report year: 2013 › Research › peer-review