Session 1-2 NordFoU

“Life-cycle aware design of bridges: research results and case studies”

ETSI 3, Abstract

ETSI started 2004 from a Finnish initiative to find better ways to balance different aspects of life cycle issues in bridge design process. Thus the name ETSI (**E**linkaareltaan **T**arkoituksenmukainen **Si**lta), Bridge with expedient life cycle. Soon Norwegian and Swedish road authorities together with local technical universities joined Finnish colleagues to form the NordFoU project ETSI. Danish road authority joined the project in stage 3 together with COWI.

The project was confined to finding methods and tools to evaluate life cycle costs (LCC), effects to the environment (LCC) and esthetical aspects of a new bridge. Safety, applications to old bridges, connection to BMS systems etc. were left for future projects. Perhaps the very key in this project was to standardize these processes so that they might be used in procurement. Possibility to compare life cycle issues instead of just looking at the investment phase opens true possibilities for new innovations in bridges. To be able to use these tools in procurement also the standardized database about how different bridge parts behave in different environments and bridge locations. The tools developed in ETSI are:

Methodology. Bridge designer includes a **life cycle plan** (maintenance actions, traffic disturbance etc.) into the bridge design using the values from the **data base**.

LCC. The current value to be added to investment cost is calculated from the life cycle plan.

LCA. Several values (toxicity, global warming, etc.) is calculated using bills of quantities and life cycle plan. Combining these values and weighing against other values is left to the designer or client in procurement.

Esthetics. The methodology, calculating method and a weighing factor based on bridge site classification is presented.

LCC, LCA and esthetic tools are finalized at the moment as well as the first versions of databases. The tools and databases are to be distributed via road authorities home pages and they are ready to be used in bridge design process. The implementation of these tools in procurement is under discussion at the moment of writing this abstract. Projects recommends that a strategy in applying life cycle issues is made and these tools are taken into action after a piloting phase.

More information: http://etsi.aalto.fi/Etsi3/

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