Combined RAMS and LCC analysis in railway and road transport infrastructures

Life-cycle cost analysis is an assessment technique used to evaluate costs incurred during the life-cycle of a system to help in long term decision making.

In railway and road transport infrastructures, costs are subject to numerous uncertainties associated to the operation and maintenance phase. By integrating in the life-cycle cost the stochastic nature of failure using reliability, maintainability, availability and safety analyses; maintenance costs can be more reliably estimated.

This research presents an innovative approach for a combined reliability, maintainability, availability and safety combined with life-cycle cost methodology for linear transport infrastructures which has been developed under the H2020 project INFRALERT (EC grant No. 636496).

The methodology has been demonstrated in two real-use cases, in railway and road, focusing on the analysis of maintenance costs associated to interventions on switches and crossings and pavement.

These two cases are part of the INFRALERT project demonstrators. It has been shown that reliability, maintainability, availability and safety analysis can be used together with individual cost figures, in life-cycle cost formulas to obtain stochastic cost estimates and cost driver's dependencies.

This knowledge can be used in cost effective long-term decisions. Adequate data, collected in the right way, and quality of reporting is crucial to obtain reliable results, which can set the bases for maintenance data collection in these types of infrastructures •