Integration of RAMS in LCC analysis for linear transport infrastructures. A case study for railways.

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Abstract. Life-cycle cost (LCC) analysis is an economic technique used to assess the total costs associated with the lifetime of a system in order to support decision making in long term strategic planning. For complex systems, such as railway and road infrastructures, the cost of maintenance plays an important role in the LCC analysis. Costs associated with maintenance interventions can be more reliably estimated by integrating the probabilistic nature of the failures associated to these interventions in the LCC models. Reliability, Maintainability, Availability and Safety (RAMS) parameters describe the maintenance needs of an asset in a quantitative way by using probabilistic information extracted from registered maintenance activities. Therefore, the integration of RAMS in the LCC analysis allows obtaining reliable predictions of system maintenance costs and the dependencies of these costs with specific cost drivers through sensitivity analyses. This paper presents an innovative approach for a combined RAMS & LCC methodology for railway and road transport infrastructures being developed under the on-going H2020 project INFRALERT. Such RAMS & LCC analysis provides relevant probabilistic information to be used for condition and risk-based planning of maintenance activities as well as for decision support in long term strategic investment planning.