



Linear infrastructure efficiency improvement by automated learning and optimized predictive maintenance techniques

INFRALERT Deliverable D5.3

Summary Sheet

**DELIVERABLE TITLE:**

**D5.3 A methodology for RAMS&LCC analysis in transport infrastructure**

**WORK PACKAGE:**

**WP5. RAMS & LCC models and analysis**

- **T5.5** Development of algorithms and tools for the use of RAMS&LCC analysis in the eIMS

**Deliverable Leader:**

CEMOSA

**Contributing Partners:**

REGENS

**EXECUTIVE SUMMARY:**

INFRALERT project develops an expert-based Infrastructure Management System (eIMS) based on state-of-the art analytics and optimisation techniques that harmonise maintenance of *linear asset* infrastructure systems in favour of increasing its efficiency and cost sustainability by selecting optimal strategic decisions with special focus given to Railway and Road Infrastructure Management.

One of the toolkits in the eIMS is devoted to the calculation of Reliability, Availability, Maintainability and Safety parameters and Life-Cycle Cost (LCC) analysis. The RAMS&LCC toolkits perform an analysis of maintenance costs taking into account uncertainties in the performance of the system through RAMS parameters such as the frequency of maintenance interventions associated with failures of components or mean time to restore these failures.

This document reports on the work carried out in Task 5.5 “Development of algorithms and tools for the use of RAMS&LCC analysis in the eIMS” within WP5. The RAMS&LCC methodology derived from previous tasks and reported in previous deliverables is formulated in a schematic or algorithm form. RAMS&LCC algorithms are tailored to the specific transport infrastructures considered in the INFRALERT demonstrators (road and rail). These algorithms will be embedded in the eIMS as an expert-based toolkit. Four set of algorithms are described:

- i. Data collectors
- ii. Pre-process tools
- iii. RAMS&LCC simulators, and
- iv. Tracker of KPIs derived from RAMS&LCC

The methodology presented in this document is the product of all the work carried out in WP5 and described in previous deliverables “D5.1: Report on RAMS data collection and failure rate analysis at component level” and “D5.2: Report on RAMS&LCC integrated models”.

This work will continue across the project’s life in order to assure that the RAMS&LCC toolkit is successfully integrated in the eIMS and to supervising the correct implementation of the algorithms according to the particularities of the systems under study. Therefore, the aim of this document is twofold:

- On the one hand, it is described the envisaged general RAMS&LCC methodology for linear transport infrastructures that could ideally be implemented as far as necessary data is available, and,
- On the other hand, it is described how this methodology is adapted to our reality, according to current practices and knowledge, and the specific data availability for the two INFRAalert pilots.

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