INFRALERT

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

**INFRALERT Deliverable D6.2** **Summary Sheet**

**DELIVERABLE TITLE:**

**D6.2 Report on models and algorithms for decision support**

**WORK PACKAGE:**

**WP6.** Smart operation and maintenance decision support

- **T6.3** Mathematical modelling and algorithm design for dynamic intervention planning
- **T6.4** Mathematical modelling and algorithm design for tactical maintenance planning
- **T6.5** Integration of factors affecting infrastructure capacity and availability

**Deliverable Leader:**
FHG

**Contributing Partners:**
CEM, USE, LTU, REG, IP

**EXECUTIVE SUMMARY:**

INFRALERT aims to develop an expert-based information system – the eIMS – to support and automate infrastructure management from measurement to maintenance. One of the final objectives is the usage of the eIMS for the decision making process in maintenance interventions planning. This report describes the close interaction of the different work packages by means of two real-world use cases, and how the different tools in the eIMS contribute to the smart decision support.
In the first use case a road network maintained by Infraestruturas de Portugal (IP) is considered. In particular, we investigate the tactical planning level, i.e., we analyse the mid-term planning where the maintenance department has to allocate major interventions over a 5 year time horizon. During the planning process, special care has been taken to avoid multiple interventions on the same road section in order to reduce traffic disturbances. Further, we integrated a traffic analysis into the optimisation process, which means we analysed which of the interventions events can be done at the same time such the disturbance of the traffic flow is minimal.
The second use case analyses the operational planning phase of a Swedish railway infrastructure maintained by Trafikverket (TrV), where we combined corrective maintenance tasks (short time scale) with major maintenance activities (long time scale) in order to reduce possession time. Further aspects covered by both use cases are the integration of probabilistic information associated with infrastructure conditions and alerts for enhancing the robustness of maintenance schedules.

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With the help of both use cases we illustrate the deployment and implementation of solutions, models and methodologies that will be developed within the project. This report provides insights into maintenance planning procedure, objectives and limitations within the planning process to facilitate the acceptance and application of the resulting methods and tools by rail and road Infrastructure managers.
The work of WP6 will continue across the whole project's life to guarantee the necessary level of integration. To this end D6.2 will serve a repository for all the changes that will occur during the project and as reference for the final validation thus becoming a live document updated regularly whenever needed.

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