

# LINEAR INFRASTRUCTURE EFFICIENCY IMPROVEMENT

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

The condition of the land transport infrastructure has a big societal and economic relevance, since constraints result in disruptions of service. The demand for surface transport will significantly increase in the next years. Given budget restrictions, a substantial enlargement of the road/rail network in the next decades is doubtful. Besides, the aging infrastructure will require more maintenance interventions which infer normal traffic operation. Therefore, the only way to increase infrastructure capacity for the increased transportation demand is to optimise the performance of the existing infrastructure. This is precisely the goal tackled by INFRALERT.



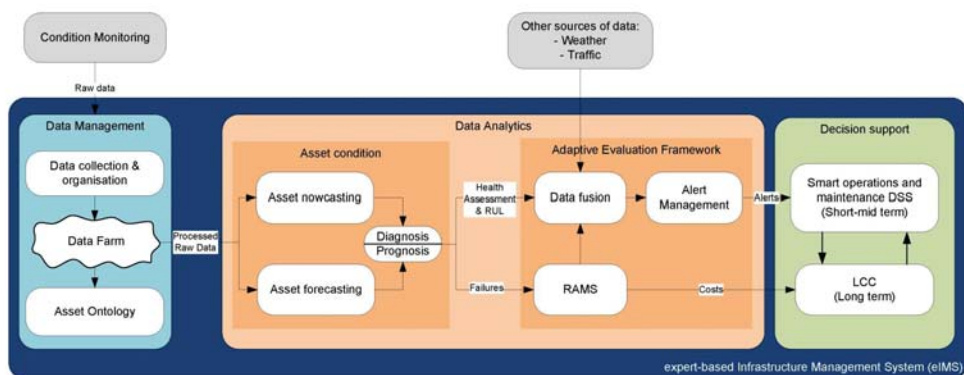
Fewer, faster and better planned interventions

INFRALERT is a research project co-funded by the EU under the H2020 programme which will deliver innovative expert-based data management and planning tools and will validate them in two real-world pilots chosen for their potential for replication: a road network in Portugal and a railway corridor in Sweden. In both cases, extensive data from auscultation campaigns are available since some years ago. The empirical development of the whole project will be based on these pilot cases.

## CONCEPT AND APPROACH

INFRALERT develops an **expert-based Infrastructure Management System** which **coordinates and integrates** all the processes for **Maintenance & Renewal** and support long term strategic investment decisions.

- Developing the **information technologies** and **standard procedures** applicable to linear transport systems in general
- Developing **expert-based toolkits** built on artificial intelligence and optimisation techniques to **support decision making** in maintenance planning, renewal and new construction of infrastructures
- Integrating all previous models and tools in a **cloud-based framework compatible** with existing **asset management** systems

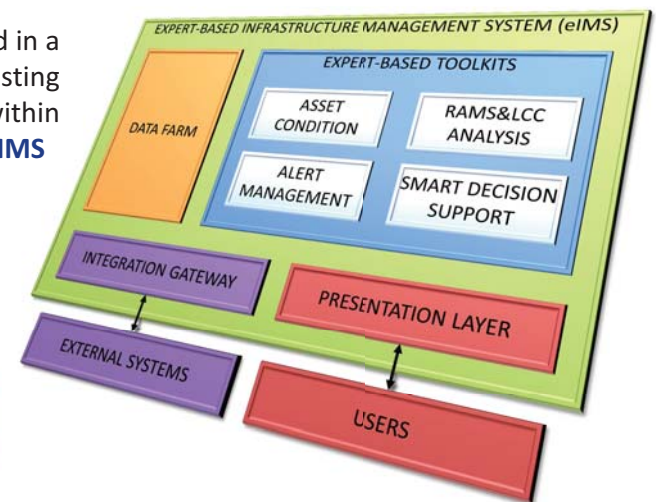


## SPECIFIC TECHNOLOGY DEVELOPMENTS

1. A tool for the collection and organisation of condition monitoring data stored in external databases -> **The Data Farm**
2. An automated Health Assessment and Prediction tool to perform accurate nowcasting and forecasting -> **The Asset Condition toolkit**
3. An Alert management system which analyses present and future asset condition data, as well as historical maintenance actions, in order to extract and manage maintenance alerts -> **The Alert Generation toolkit**
4. Methods and tools to evaluate and forecast RAMS parameters and LCC dynamically -> **The RAMS&LCC Analysis toolkit**
5. Decision support tools for interventions planning on the tactical and operational level, as well as the generation and analysis of new infrastructure construction long-term scenarios -> **The Smart Decision Support toolkit**
6. A cloud-based system which hosts the expert-based toolkits and includes all the necessary integration and communication layers -> **The eIMS**
7. **Demonstration:** Road network in Portugal + Rail corridor in Sweden

### Modular concept

The system will be developed in a modular architecture, consisting of several plug-in modules within a common framework: the **eIMS**



## DEMONSTRATION SITES



**Road network**, Coimbra region in the centre of Portugal, managed by Infraestruturas de Portugal



**Railway corridor**, Iron Ore Line in Malmbannan in northern Sweden, managed by Trafikverket

## THE INFRALERT CONSORTIUM



## FACTS & FIGURES

- Total budget: € 3,2 million
- Duration: 36 months
- Project Coordinator: Fraunhofer IVI
- Start date: 01/05/2015



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