

Title: Decision support for tactical planning of maintenance activities – a use case for the INFRALERT project

The on-going H2020 project INFRALERT aims to provide Infrastructure Managers with IT tools to support the decision-making process when planning maintenance activities and interventions. In this talk we will focus on the application of the INFRALERT decision support toolkit to a road pilot from *Infraestruturas de Portugal (IP)*, where we concentrated on the tactical planning level.

In this pilot, the decision maker has to allocate major interventions over a 5-year time horizon. The interventions are aggregated as single events over 500m-segments of certain road sections to avoid multiple traffic interruptions on the same section. The monthly allocation of interventions include:

- i) The allocation of a starting month for intervention events.
- ii) The selection of a limit for the minimum degradation level for a section.

Further, several restrictions e.g., not falling below a certain quality level, meeting budget restrictions or capacity limits for supervisory staff, has to be satisfied. We aim to optimize simultaneously the costs, the quality index and the availability of the network.

The allocation and selection of interventions is based on alerts generated by the INFRALERT Alert Management toolkit, which depends on predicted future conditions resulting from the Asset Condition toolkit. Thus, the input for the decision support are no concrete work orders but predicted work orders and the corresponding probabilities of occurrence. Due to this uncertainty the tactical planning problem becomes a stochastic optimization problem, that calls for specific modelling and solution techniques. The corresponding mathematical optimization model and the handling of uncertain information realized via a scenario approach will be subject of the talk.