

## Long Term Cross Asset Management of Highway Infrastructure

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## Summary

The paper describes a case study on a highway section in Austria comprising 100 structures conducted for the Austrian Federal Highway Company ASFINAG in 2011. A tailored life cycle model was developed utilizing state-of-the-art information from literature and VCE's experience gained in the course of performing bridge monitoring and bridge inspection worldwide. This knowledge has been incorporated into the assessment procedure that is described in the paper. Probabilistic methods are used for the service life calculations of the whole structure as well as for individual items delivering lower and upper bounds of life expectancy. Based on the available structural information, inspection reports and traffic data maintenance instructions were elaborated in order to ensure the demanded structural service life and operability. Besides cost optimization the main focus was on the minimization of traffic impediment. The case study includes different budget scenarios given by the client over a period of 30 years.

**Keywords:** life-cycle management, maintenance planning, deterioration & cost analysis, cross-asset optimisation

## 1. Introduction

Managing assets is about making decisions. Current practices are characterised by methodical diversity and fragmented approaches. In the course of IRIS (European Commission FP7) an integral approach for infrastructure management was developed.

The basis is the consideration of the entire life cycle of engineering structures. The following major aspects are covered:

- a) The determination of the DESIGN LIFE OF NEW structures
- b) The estimation of the RESIDUAL LIFE OF EXISTING structures
- c) Assessment criteria whether the REAL DEGRADATION PROCESS corresponds with the applied life cycle model, in order to take corrective measures
- d) MAINTENANCE INSTRUCTIONS to guarantee the original design life and operability

All relevant datasets (Key Performance Indicators) are incorporated into a probabilistic model to cover occurring uncertainties during structural service life. To reflect the common composition of inspection routines even characteristics of individual structural members are considered - making it coherent with civil engineering practice worldwide.