# Facility Management for an improved serviceability of road tunnels

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## Summary

A very high service availability is important for the operator and for the user of road tunnels, too. The service availability of a structure is directly related to its quality. The earlier quality assurance measures are being considered during the life cycle, the better a structure of high quality can be guaranteed. Problems which occur during the operation period of a structure often result from design errors or from inadequate realisation during the construction phase. They may also occur as a result of wrongly planned maintenance and refurbishment works. Thus, the transfer of specific data, information and experiences through the whole life cycle is very important. In this context methods of facility management can provide efficient assistance when they have already been used throughout all three classic phases of a structure‘s life cycle - planning, construction and operation. Finally the tunnel drainage system of German road tunnels is considered as an example as practical application possibility.

**Keywords**: road tunnel; service availability; quality assurance measures; life cycle; facility management; tunnel drainage system.

## 1. Introduction

Traffic tunnels are usually located where no adequate alternatives for traffic are available or at least are connected with considerable disadvantages. Especially road tunnels mostly represent highly needed key elements of the infrastructure network. That means high service availability is always a main target for the operator. Ensuring high service availability is thereby strictly connected to an efficient operating strategy, whereas methods of facility management are a useful help in the way they are exercised in the modern real estate economy. Especially taking a holistic approach for evaluating a specific structure – thus regarding all phases of lifetime, as there is planning, construction and operation up to the dismantling of the structure – has to be considered as a reasonable method.

Regarding German road tunnels these reflections do not only have an influence on the German national economy. Since Germany is a country which is highly frequented by transit traffic, especially regarding its position within the European community, these problems are a serious concern for the EU-wide infrastructure network. Therefore a conclusive and efficient life cycle strategy has to be carried out to ensure high service availability for those structures. In addition, it can be expected that the fields of operation and maintenance will become increasingly important for the upcoming tasks for research and development in the future [1].

In the following, possible strategies for generating an efficient facility management for tunnels are described by taking German road tunnels as an example. During the operation of such structures a large variety of factors has to be considered, out of which a first focus is given to the detail aspect of permanent drainage systems. Throughout the last years there has been a significant progress regarding drainage systems, determined by a large amount of analysis and research [2, 3, 4]. As a result a new guideline for planning, construction and operation of drainage systems for road tunnels has been developed and it will be released in the near future by the Federal Highway Research

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