Process-oriented and effect-oriented management for operational street maintenance - Intra-municipal street maintenance model (ASTRA2008/004)

Prozess- und wirkungsorientiertes Management für den betrieblichen Strassenunterhalt – Modell des siedlungsübergreifenden Strassenunterhalts

Funding: National (Switzerland)
Duration: Dec 2009 - Aug 2014
Status: Complete with results

Background & policy context:

Swiss municipalities are caught in the crossfire between their citizens' high demands on quality that have meanwhile become a matter of course, the high competitive pressure with regard to the benefits of future locations (tax advantages) and the increase in cost pressure in relation to the provision of public services. The result is that Swiss municipalities feel themselves subjected to enormous pressure and stretched to maximum capacity as they battle to meet the ever-growing complexity of the demands and tasks they face.

It is for these reasons that alternatives to providing public services (other than fusion negotiations) are becoming more frequently sought after to increase efficiency and enable municipalities to satisfy the high demands of their citizens.

Objectives:

The research project aims to develop a maintenance model for owners of streets in built-up areas to serve as a decision-making basis for intra-owner cooperation with the aim of significantly improve effectiveness and efficiency of street maintenance.

The performance model will identify the optimized equipment inventory and size of the base team. It will develop optimal basic structures in the performance model that can then be collated with the help of the maintenance model to create an optimized overall organizational structure based on the performance requirements.

The performance and maintenance model will be tested in practice. The primary objective of the intra-owner model is to improve efficiency and reduce costs by designing effect-oriented processes.

Methodology:

Work Package 1: Fundamentals - Scope: actual power and actual cost analysis
  Research (counting of performance, interviews), expert interviews

Work Package 2: Basics – Performance Model, Performance Analysis

Work Package 3: Cross-maintenance model

Work package 4: Practice Test – consolidation and cleaning of the model at three owners of roads in urban areas

Work Package 5: Compilation of results: scope, performance and maintenance model, controlling system worked out for use in practice

Parent Programmes: ARAMIS - ARAMIS information system

Institute type: Public institution
The results of the project will enable municipalities to maintain their ability to act and therefore offer their citizens an attractive location in which to live and work. To this end, a process and decision-making model of intercommunal cooperation on the economic optimization of municipal maintenance services was developed within the scope of the research project ASTRA2008/004 "Process and effect-oriented management in operational road maintenance".

It consists of parts A, B and C. Part A by the Institute for Construction and Infrastructure Management of ETH Zurich (author: L. Koller) focuses on the development of a decision-making process model for intercommunal cooperation in the field of operational road maintenance.

The achievement of objectives in Part A is secured on the basis of two sub-models (Submodel I: cost-performance model for optimum device configuration and Sub-model II: facility location route model for decision-making in intercommunal cooperation on operation road maintenance). On an operational level, sub-model I focuses on developing and deriving an objective function for determining the ideal range of equipment according to the developed model by Girmscheid.

A holistic performance estimation model that identifies performance-reducing factors and takes them into consideration in cost estimations was developed on the basis of defined theoretical system boundaries. This calculation model provides as a result a cost-performance function for each piece of maintenance equipment that enables optimum resource allocation planning aimed at achieving the best possible use of available resources whilst giving due consideration to aspects of increasing efficiency in relation to task fulfilment.

The cost performance model enables the simulation of performance limits for each piece of equipment together with the corresponding cost parameters. Sub-model II builds on the results from sub-model I and provides the persons responsible with a model for determining the ideal inventory depot location and route planning, enabling them to achieve minimum overall costs by systematically applying the model concept.

These theory-based model results are subjected to a feasibility check to verify and guarantee the practical suitability of the model in hand.

Part B by WIFpartner AG (authors: J. Dreyer, A. Herlyn) presents the evaluations and results of an empirical study carried out in municipalities of the canton of Zurich together with those of a practical test.

Policy implications

Supporting tool for the Swiss municipalities for decision making in the field of street maintenance.

Documents:
- Street management (Final report)
- STRIA Roadmaps: Infrastructure
- Transport mode: Road transport
- Transport sectors: Passenger transport, Freight transport
- Geo-spatial type: Urban