CONSISTEND

A tool to assess the impact of construction process quality on the performance of pavements and its implementation in tenders

Research project funded under the CEDR Transnational Road Research Programme
CEDR Call 2013: Energy Efficiency - Materials and Technology

CEDR Call 2013: Energy Efficiency is a Transnational Road Research Programme organised by CEDR (Conference of European Directors of Roads). The funding partners for this programme are Austria, Germany, Norway, UK, Slovenia and Netherlands.

Details	
Acronym:	CONSISTEND
Start:	April 2014
End:	March 2016
Budget:	EUR330.0k
Co-ordinator:	Jos Wessels, TNO, Netherlands
Contact:	jos.wessels@tno.nl
Partners:	RODIS, Ireland
	TRL, UK
	ZAG, Slovenia
PEB Project Manager:	Jan van der Zwan, Netherlands, jan.vander.zwan@rws.nl
Website:	N/A

Project Summary:
Quality control during the construction process is, next to road design and material selection, an important factor that determines the performance of an asphalt road with respect to its service life. In this project a tool is being created that will improve the quality of work during construction by improving the understanding of the risks involved in specific road construction circumstances and by providing ways to manage the risks. The practical use of this tool as part of procurement procedures will be demonstrated in pilot projects and a guideline for implementation by national road authorities and road industry will be provided.

A longer functional life of a road has enormous impact on the carbon footprint of that road due to minimized use of materials and energy during the life cycle. Improving construction quality also provides greater certainty of pavement life which in turn assists NRA's with future maintenance planning. New technologies are readily available to monitor a wide selection of parameters during construction to improve quality control. The challenge lies at defining which parameters have the largest impact on the service life under specific circumstances and are therefore the most beneficial to monitor and control during construction.

The construction of asphalt roads is mainly based on the specific empirical experience of the engineers designing and making them. There is a limited amount of data available on the relation between construction parameters and service life whereas there is a lot empirical knowledge about which construction parameters have the greatest influence on service life.

The project primarily aims to combine available data on the influence of construction parameters on service life with the knowledge of experts of different EU member states which will provide a ranking list of the parameters that are most important to monitor and manage during construction. Secondly, it will incorporate the combined data into a tool that can perform real time analyses of the effect of quality control measures taken under specific conditions, resulting in a quantified risk reduction.

To achieve these aims, the project is:

• Collecting information that relates construction quality to service life were risks are specified from real data in combination with expert opinions from different EU member states. This information is being structured in a database.
• Collecting information about currently practiced quality control methods, managing strategies and enforcement by contractors and road owners of different EU member states and how these could be improved.
• Building a risk-based tool that presents the most important parameters that influence service life. The tool is based on an algorithm that processes information from the database containing service life and risks associated with the construction process. Within the tool, quality control options can be selected to demonstrate quantifiable extensions of the service life, greater certainty of service life and to calculate the associated reduction of risk for a selection of approaches.
• Applying the tool in a procurement procedure during a pilot project to verify its usefulness and produce a guideline for implementation by EU member states National Road Authorities and road industry.

This project provides a direct response to the call as it focuses on the increase in energy efficiency of road construction when advanced quality control methods are used within the contractual context.