

MOBI-ROMA
Mobile Observation Methods for Road Maintenance Assessments

a research project of the
cross-border funded joint research programme
“ENR2011 DESIGN – Rapid and durable Maintenance Method and Techniques”

1) Introduction

“ENR2011 DESIGN – Rapid and durable Maintenance Method and Techniques” is a trans-national joint research programme that was initiated by “ERA-NET ROAD II – Coordination and Implementation of Road Research in Europe” (ENR2), a Coordination Action in the 7th Framework Programme of the EC. The funding partners of this cross-border funded Joint Research Programme are the National Road Administrations (NRA) of Belgium, Germany, Denmark, Finland, France, Netherlands, Norway, Sweden, Slovenia and United Kingdom.

2) Project Facts

Duration:	01/09/2011 – 31/01/2013
Budget:	EUR 340.000
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3) Project Description

MOBI-ROMA develops and evaluates the benefits of the new satellite positioning techniques and operational concepts for road management assessment needs utilising Floating Car Data (FCD). The concept is to combine and process available data from fixed measuring field stations and floating cars. The combination of different sources of data gives a novel opportunity for efficient monitoring and detection of variations in pavement and road conditions. This approach enables development of maintenance tools for road conditions during various times of a year and various traffic conditions. Data from the CAN-BUS¹ within the car are applicable as a quantitative basis for signal processing and analysis. The road parameters that can be estimated with the MOBI-ROMA method are for instance:

¹ CAN-BUS = Controller-area network, a vehicle bus standard designed to allow microcontrollers and devices to communicate with each other without a host computer. CAN is one of five protocols used in the OBD-II vehicles diagnostics standard.

- Quality of the road condition
- Strength of road bed
- Need for winter maintenance

In order to demonstrate its applicability, a Graphical User Interface will be developed, and a pilot will be demonstrated in test areas in Sweden and Germany. The results will be evaluated carefully, and cost/benefit analysis made in order to assess the feasibility and benefits of these new methods in road maintenance.

4) Expected Results

The emergence of Global Navigation Satellite Systems such as GPS, Glonass and the coming Galileo has allowed the development of various new mobile observing techniques with unprecedented spatial accuracy. The resolution of the new measurements may be 1000 times better compared to the conventional fixed network output. The method is expected to gain significant improvement of the management of the European road network in a very cost-efficient way. It will also take road management forward in a consistent and practical approach. It can be implemented for all types of road network all around EU where FCD or mobile observations are available.

The basic hypothesis is that in-vehicle information from the CAN-bus outlet provides several kinds of mobile observations that can be used in combination with data from fixed stations to assess road surface conditions and other parameters which are considered as important for road maintenance planning. This is possible since the variation of road surface conditions is related to the signal from the vehicle. A reference for modelling of corresponding relation is provided by the information from the fixed stations. After data fusion and analysis and effective dissemination of information through a Graphical User Interface, more comprehensive and timely information for road maintenance is provided.

Our hypothesis is also that we can use information from normal car sensors that can be refined to estimate the condition of the single road section. This will then be gathered from several cars to give estimate of the status of the complete road network. In a future system we foresee that it will be possible to follow the changes in the road network on a week to week basis.

The benefits of MOBI-ROMA expects to be 1) assessment of performed maintenance works through directly applicable intelligent information support and 2) The product facilitates further development of intelligent traffic information network, through providing data needed for adequate maintenance planning and prioritizing between different maintenance works and sections. Both steps will increase performance of the maintenance actions and decrease disturbances of traffic flows, which will altogether result in increased safety and beneficial economic effects.

The method and the pilot Graphical User Interface developed in MOBI-ROMA will be tested in northern and middle parts of Europe (Sweden and Germany) and evaluated by key stakeholders. It is applicable in any country regardless of its climatic features, thus providing imminent benefits to road owners and road maintenance operations throughout Europe.

The overall benefits of the MOBI-ROMA project will be economic by providing a more cost-effective technique for road condition monitoring compared to the present methods, and socio-economic, by increasing the awareness of all road users on the condition of the road network. The system has also positive effects to road safety as it can be used for better and more optimised winter road maintenance operations.