

ROSTMOS - Remote sensing techniques to monitor driving conditions in wintertime

Background

Real-time information of driving conditions and forecasts for road state development on the road network will enable contractors and road owner to take action in the right place at the right time with the right method and with proper effort. The data can come both from RWIS stations, vehicle-mounted sensors and from cars where the vehicle act as sensor systems detecting slippery road conditions. Included in the information systems available for the drivers, such systems will also have a major traffic safety potential.

Purpose

One of the main activities in the ROSTMOS project (Road State Monitoring System) is to conduct tests of different type of technologies for monitoring the road state; both fixed mounted nonintrusive sensors and vehicle mounted sensors for mobile monitoring of the road surface conditions. ROSTMOS is a Nordic project with partners from Norway, Denmark, Sweden and Iceland. Most emphasis will be put on optical sensors for mobile measurements. Other technologies investigated are techniques like image analysis.

The idea is that the solutions studied in the project will support both strategic and operational decisions made by the road owner, contractors and traffic information centers. In addition to contributing to making winter operations more effective and improve traffic information systems, the project will also demonstrate how ITS can be used in quality control and documentation.

Methods

The performance of different technologies for monitoring the road state and data quality is one of the main issues in the ROSTMOS project.

The testing of optical sensors includes:

- Experiments in laboratory
- Field-tests on closed tracks
- Field-tests on ordinary roads

The sensors give the following type of parameters:

- Temperature (air and road surface)
- Water film thickness
- Road State (categories vary for different products)
- Friction estimate

Results

Comprehensive field tests have been carried out on optical sensors in Norway the winter season 2014/2015 and the paper will report on the results from those tests with regards to the different parameters except for water film thickness. The results are promising both for the categorization of the road surface conditions, for the friction estimate and for the temperature. However, there are some challenges especially for the friction estimate under certain road conditions.

Conclusion

Remote sensing by use of optical sensors is a very useful technology to monitor the road state and is considered as an important tool giving input to Maintenance Decision Support Systems where precise information about the actual driving conditions is important to calculate reliable prognoses.