Abstract for SIRWEC 2016

Title: A brand new winter maintenance decision support system
Related topic: The role of decision support systems in road weather and highway operations
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With MeteoGroup's new Decision Support System (DSS) road managers will be supported to make the right road treatment decisions in different wintry conditions. The system is developed in close cooperation with our customers and combines all relevant information into a clear treatment advice. One of the main differences compared to existing DSS systems is the fact that residual salt (from different sources) is taken into account. The DSS helps deciphering weather and road information and proposes treatment options. In the end maintenance managers apply their knowledge of the local behavior of their roads to make the final decision.

Road winter maintenance heavily relies on an accurate weather forecast. MeteoGroup's road forecast model translates the weather forecast into a location specific road surface temperature and condition forecast. This information helps the road manager to make decisions on the required actions in his domain. However the road weather forecast is just one element of the complete information, which is needed to make the right decision. The road manager will combine weather information with actual measurements of road surface temperature and residual salt. Based on these data, the treatment policy and his own rules of practice, the road manager makes a final decision. The goal of the new DSS is to bundle all relevant information into a clear treatment advice for the next 24 hours in order to support the road manager in his decision.

Detailed road weather forecast for a route and the resulting treatment advice from DSS at the bottom

The DSS provides a treatment advice; basically "where", "when" and "what":

- **Where**: For each route DSS presents a treatment advice. The latest measurements and site-specific forecast from a representative RWIS station are used as input. Also freezing point and residual salt information based on observation data from this particular location is automatically taken into account in the advice. In a next version of DSS we will extend the system by using information from our route based forecast model.
- **When**: DSS shows a time window for each route in which the salting (and/or ploughing) action needs to take place. It shows an optional time window and a final hour to start salting in order to be safe. It takes into account forecasted factors like amount of water on the road surface, amount of residual salt and dilution due to precipitation.
- **What**: The system shows – based on the policy and rules of practice of the individual road authority – the type and amount of chemical to be used. Rules of practice are provided by the road manager. These contain for example the time required to treat a certain route, the type and dosage of chemical to be used in case of certain road conditions and the snow amount at which ploughing needs to start.

The new DSS provides an overview in one glance of the advised treatment actions for each route, in order to facilitate an objective decision by the road manager. The system is currently in pilot phase and tested by some of our main customers. First feedback is very positive: the system gives valuable information in a clear overview.