FORECA SNOW ACCUMULATION SERVICE

A CASE STORY OF DEVELOPING A DECISION SUPPORT SYSTEM FOR WINTER MAINTENANCE ACCORDING TO A CUSTOMER'S WISHES.

INTRODUCTION

The customer, Finnish Transport Agency (FTA), is responsible for supervising governmental roads in Finland and ensuring the roads are maintained and safe in winter time. Finland has been split into about a hundred maintenance areas, where the roads are maintained by different contractors. There are five different classes of roads defined by their different requirements for winter maintenance actions.

REQUIREMENTS FOR THE SERVICE

The customer needed a tool for monitoring the snow accumulation on the roads. The tool would help supervise the required plowing actions made by several contractors. The service would be used by areal supervisors (40 persons), but also the contractors (2-3 managers per area).

A user management was required to limit permissions to the data and enabled personalization of the service for users' own maintenance areas or plowing routes. A tool for setting personal maintenance alerts and a history archive was required as well.

THE SCOPE OF THE SERVICE

The service tracks snow accumulation only. The fully-fledged Foreca Road Weather Modelling System was not used in the service. The road modelling system can further improve the service by taking into account aspects such as ice formation, residual salt, blowing snow, melting snow, bridge modelling etc. Additionally, mobile measurements of road surface state can be utilised by the Road Weather Modelling System. Foreca weather maps were also opted out from this service.

The service excluded non-governmental roads which are supervised by cities and municipalities. The user interface was provided in Finnish.

MAIN FUNCTIONALITIES

MAP VIEW
The map view shows the snow accumulation on the roads at a glance. The colour codes are based on the road-specific plowing requirements.

MAINTENANCE ALERTS
Set alarms and receive notifications according to the plowing requirements based on the observed or forecasted snow accumulation.

USER MANAGEMENT
You only see the roads in the areas or plowing routes that are assigned to you. Areas and routes can be assigned with the user management tool.

ARCHIVE VIEW
Use the “time machine” by selecting a specific date and time in history. The archive view shows the past situations retrospectively.

SNOW ACCUMULATION
Clicking a road segment shows the snow accumulation on a timeline. Road status codes (colours) on the map are based on the snow accumulation against the road-specific plowing requirements.

ROAD STATUS CODES
- Maximum snow depth exceeded
- Plowing should have been started
- Plowing not required yet

GRAPH TIMELINE
Latest observations
Current time and forecast
THE SERVICE DEVELOPMENT

The service needs were initially discussed together with the customer, and the actual service functionalities were also iterated together along the service development phase. That way, we found the best solutions and could take all of the customer needs into account together with Foreca expertise regarding the opportunities and limitations from a technical and meteorological standpoint.

MATCHING ROADS TO FORECASTING DATA

The customer provided Foreca with the geographical information and the maintenance classes of the roads as GIS data. Foreca mapped the roads into its system along with the coordinate-based weather forecasts. Weather information was mapped along the roads in 1km long segments. Cross-roads were mapped separately to fit the actual plowing routes and different road classes.

MATCHING THE PLOWING THRESHOLD VALUES TO THE ROADS

There were five different road maintenance classes with varying plowing requirements already documented by the customer. The required plowing starting times, plowing time spans, and the maximum snow depth allowed, were specified according to snow accumulation. The road status codes, graphs and maintenance alerts in the service were adjusted to follow the rules and values specified in the documentation.

USER MANAGEMENT FOR INDIVIDUAL MONITORING AND MAINTENANCE ALERTS

The user management system was implemented into the service, enabling administrators to create users with personalised views and credentials. The pre-defined maintenance areas can be individually made visible on the map view based on users' roles. Furthermore, maintenance alerts can be subscribed to and customised based on individual preferences.

NEED A SERVICE? DESCRIBE US YOUR NEED!

Take the following steps for the best results:

1) Think about what your biggest challenges in winter maintenance are and define your needs or wishes for the best possible weather service for you.

2) Contact sales@foreca.com and tell us your challenges and wishes. Let’s cooperate and find the possibilities, restrictions and requirements in your area for the perfect weather service fit for your organization.

3) Foreca will define and develop the service for you. You will get the work estimate, price estimate and a list of possible requirements from your end. We deliver our services globally.