Automated Road Condition Forecasts on a Public Map Service

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SIRWEC 2012

- The Road Condition service
- Functionality
- Technology
- Service model
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The Road Condition service

- New fully automated road condition forecast system
- Offers accurate real-time information about road conditions and weather
- Improves traffic safety and predictability
- Reduces work load of road weather professionals on duty
- Helps ordinary people to plan and schedule travel routes according to prevailing road conditions
The Road Condition service

• Delivered for the Finnish Transport Agency

• Procured for the Centre for Economic Development, Transport and the Environment for Southeast Finland

• Delivered as a turnkey solution by the Finnish GIS-company Karttakeskus

• Forecasts and weather model produced by the Finnish Meteorological Institute (FMI)
The Road Condition service

• Available for the public at no cost

• Available during winter months

• In Finnish, Swedish and English
  • Keliennuste / Väglagsprognos / Road Condition

• Provided online on the Finnish Transport Agency website
  • http://www2.liikennevirasto.fi/alk/english/keliennuste/
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National summary view

- [http://www2.liikennevirasto.fi/alk/english/keliennuste/](http://www2.liikennevirasto.fi/alk/english/keliennuste/)
The forecast does not take into account road maintenance (de-icing and snow removal)
Road condition and weather information

- **Overall road condition classification**
  - Normal / Bad / Very bad

- **Weather symbol**
  - Type of rain or snow
  - Cloud cover
  - Sunlight

- **Wind**
  - Speed
  - Direction

- **Temperature**
  - Air temperature
  - Road surface temperature
Possible textual explanations

• Road Condition
  • The road is dry
  • The road is moist
  • The road is wet
  • Slush on the road
  • Frost on the road
  • The road is partly icy
  • The road is icy
  • Snow on the road

• Rain
  • Fair weather
  • Weak rain
  • Moderate rain
  • Heavy rain
  • Weak snowfall
  • Moderate snowfall
  • Heavy snowfall

• Wind
  • Light breeze
  • Moderate breeze
  • Fresh breeze
  • Strong wind

• Visibility
  • Fairly poor visibility
  • Poor visibility

• Friction
  • Slippery
  • Very slippery

• Other
  • Snow on a cold road
  • Supercooled rain
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The Road Condition web service

- Map interface
- Multiple programming languages
- Multiple data sources
- User friendly

The forecast does not take into account road maintenance (de-icing and snow removal)
Real-time road condition information

• The road condition data is retrieved from the FMI servers to the web map service.

• Observations are updated every 15 minutes.

• Forecasts are updated every hour.

• Road weather camera pictures are retrieved from the Digitraffic interface every 15 minutes.
Observation data

• Primarily from the road weather stations of the Finnish Travel Agency

• Secondarily from the road weather model of the Finnish Meteorological Institute

• In contradictory situations, poor conditions are weighted more
Forecast data

- From the FMI road weather model
- 1-dimensional energy balance model
- Observation data used for initializing the current time step
- Combines weather information
Forecast quality control

• Forecasts automatically compared to respective observations by the Road Condition service.

• Forecast quality is interpreted from the difference of the condition class.

• The quality is assessed regularly by the control group of the service.

• The knowledge gained is used to develop the road weather model.
The Road Condition service
Functionality
Technology
Service model
Multiple stakeholders

- Finnish Transport Agency
- Centre for Economic Development, Transport and the Environment for Southeast Finland
- Karttakeskus
- Finnish Meteorological Institute
- All road users
Turnkey solution

• Karttakeskus
  • Overall service management
  • Production and maintenance of the Road Condition web service
  • Development
  • 24/7 monitoring

• Finnish Meteorological Institute
  • Production and maintenance of the weather models and forecasts
  • Development

• 24/7 e-mail and phone support service provided together for road weather professionals
Effective collaboration

• Regular control meetings
• Collaborative development
• Sharing knowledge from different fields of expertise
Conclusions

• Road Condition – the public online forecast map service
• Accurate real-time information from multiple data sources
• Meets the needs of road professionals and the public
• Continuously and collaboratively developed
Thank you

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