

SIRWEC 2012

Automated Road Condition Forecasts on a Public Map Service

Tero Dubrovin

SIRWEC 2012

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

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

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/>

Road Condition

Current situation

18:34 (Tuesday) 

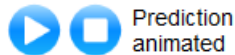
Forecast

20:00 (Tuesday)

22:00 (Tuesday)

00:00 (Wednesday)

06:00 (Wednesday)



Road Condition for Road Section

[Uusimaa](#)

[South-West Finland](#)

[Satakunta](#)

[Kanta-Häme](#)

[Tampere Region](#)

[Päijät-Häme](#)

[Kymenlaakso](#)

[South Karelia](#)

[Southern Savo](#)

[Northern Savo](#)

[North Karelia](#)

[Central Finland](#)

[South Ostrobothnia](#)

[Ostrobothnia](#)





[Central Ostrobothnia](#)

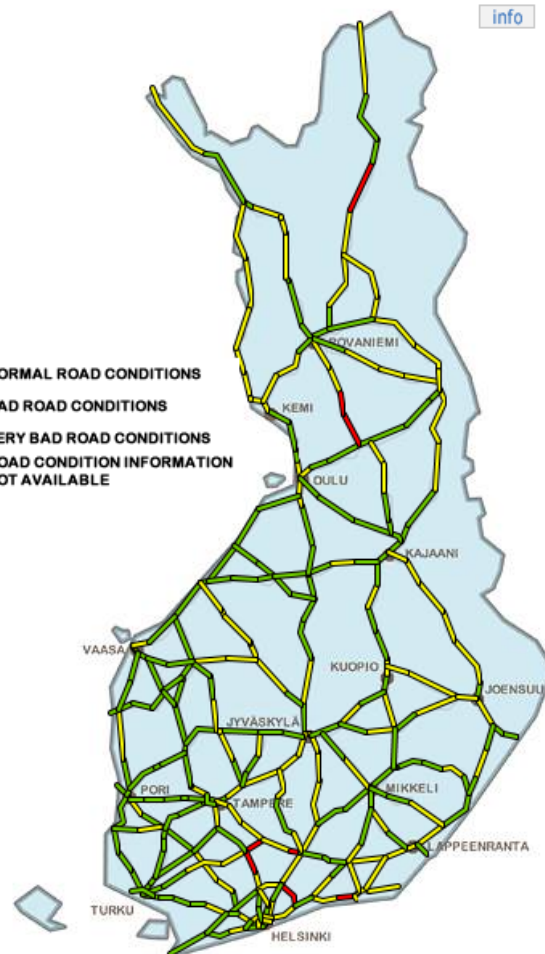
[Northern Ostrobothnia](#)

[Joint authority of Kainuu](#)

[Region](#)

[Lapland](#)

-  NORMAL ROAD CONDITIONS
-  BAD ROAD CONDITIONS
-  VERY BAD ROAD CONDITIONS
-  ROAD CONDITION INFORMATION NOT AVAILABLE



Interface of the Road Condition service

Front page | **Observation** | Ennuste 20:00 | 22:00 | 00:00 | 06:00 | info

Tuesday 28.2.
Tie 55 Porvoo - Mäntsälä

OBSERVATION

CLASS	WEATH.	WIND	AIR	ROAD
18:30			-3	-3
Snow on the road. Supercooled rain.				

FORECAST

CLASS	WEATH.	WIND	AIR	ROAD
20:00			-4	-4
Snow on the road.				
22:00			-4	-5
Snow on the road.				
00:00			-5	-5
The road is icy.				
06:00			-6	-7

■ NORMAL ROAD CONDITIONS
 ■ BAD ROAD CONDITIONS
 ■ VERY BAD ROAD CONDITIONS
 ■ ROAD CONDITION INFORMATION NOT AVAILABLE

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

Tuesday 28.2.
Tie 55 Porvoo - Mäntsälä

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Possible textual explanations

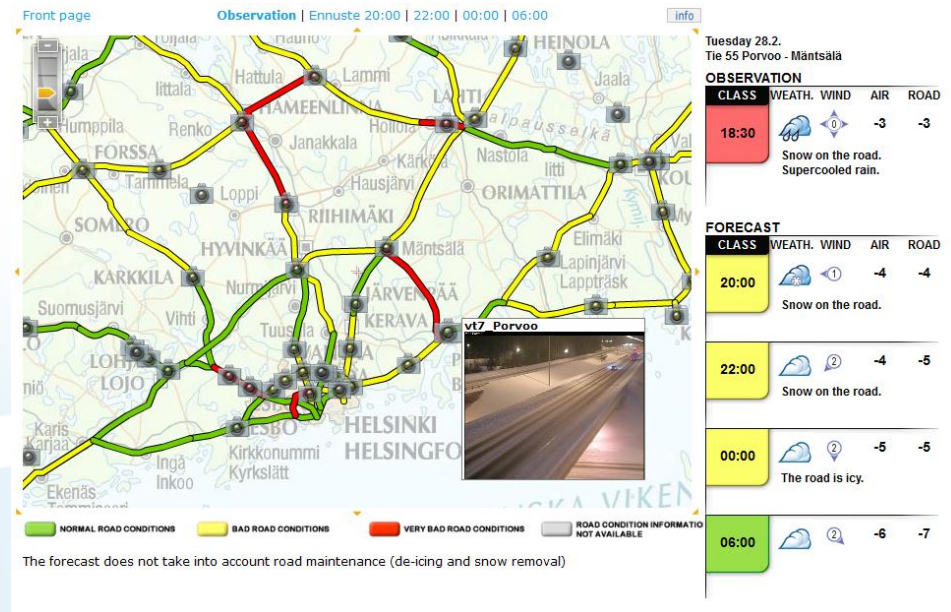
- Road Condition
 - The road is dry
 - The road is moist
 - The road is wet
 - Slush on the road
 - Frost on the road
 - The road is partly icy
 - The road is icy
 - Snow on the road
- Rain
 - Fair weather
 - Weak rain
 - Moderate rain
 - Heavy rain
 - Weak snowfall
 - Moderate snowfall
 - Heavy snowfall
- 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



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.

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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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