



Real-time road weather data in winter maintenance of cycling routes

33. Winter Road Congress, Tampere
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This is ultimately the case...



Can you distinguish slippery?

A)



B)



C)



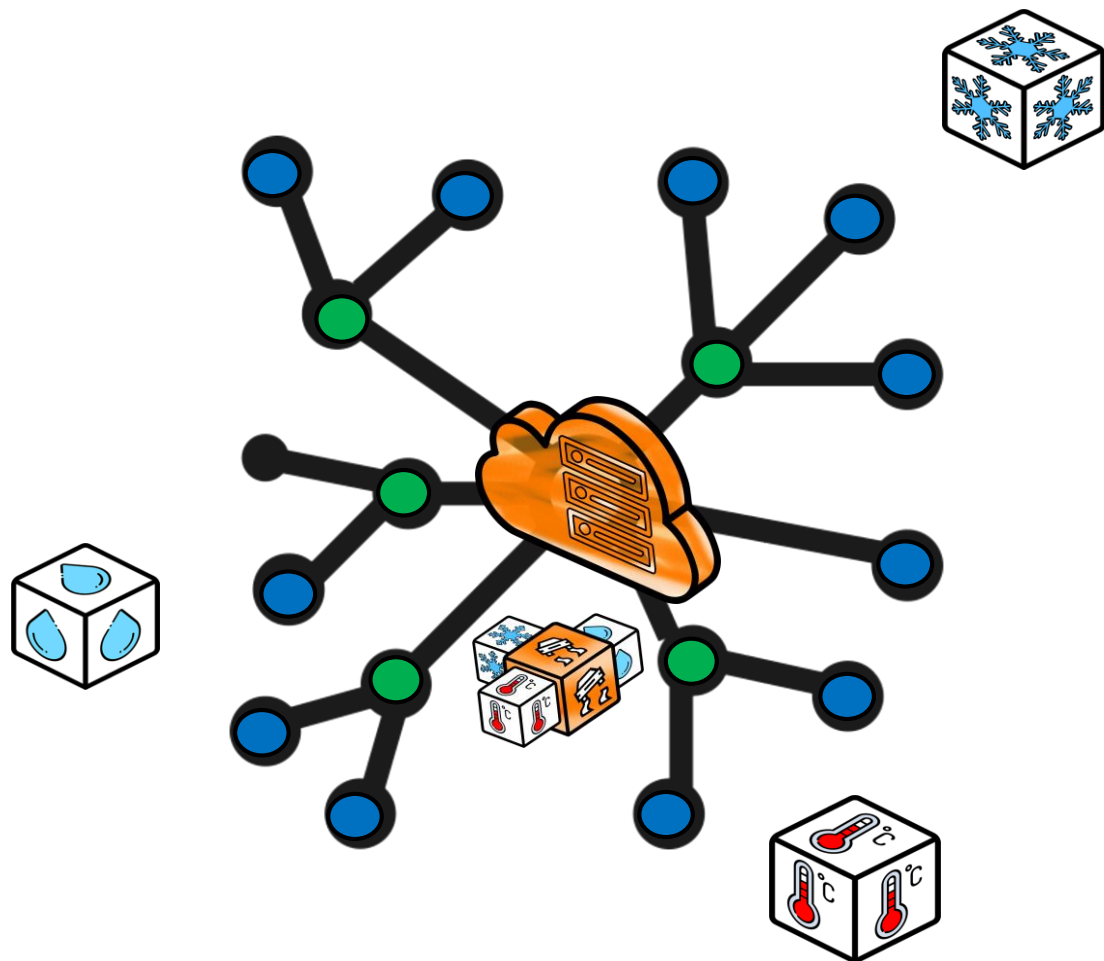
Outside temperatures

0°C

-2,1°C

+1,5°C

From data...



1010
0101
1010

● Numbers



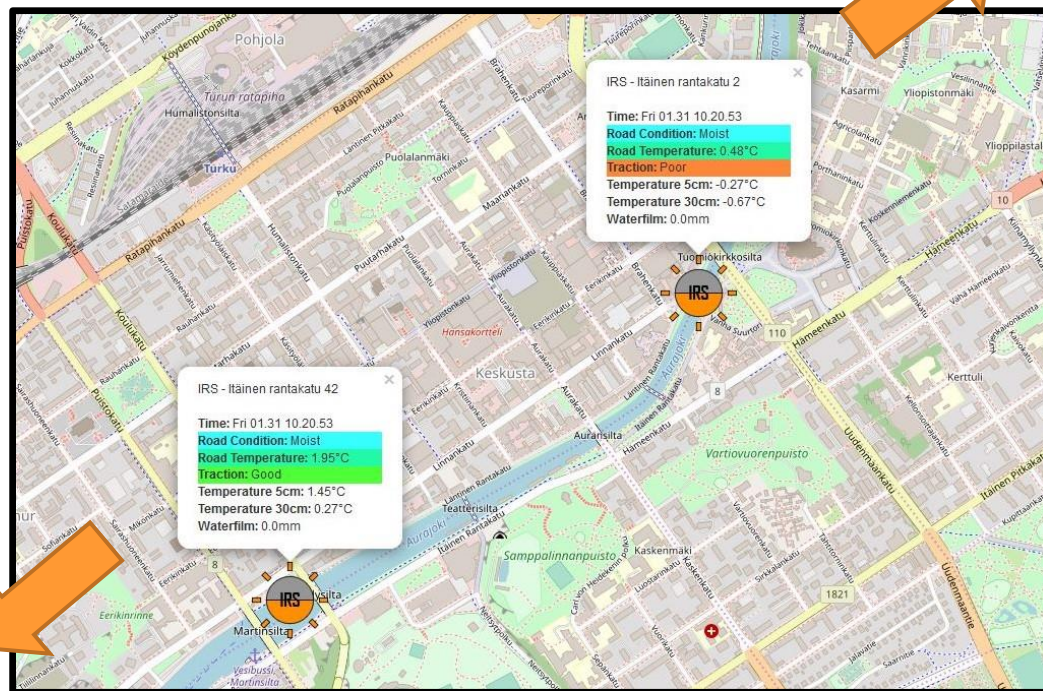
● Recording



● Calculation

...to monitoring

Alarms



Example picture of condition status in test route of Turku at IW RWS service.



Weather Guard

What can be achieved?



- ✓ reducing slip and fall accidents



- ✓ automated monitoring of road quality requirements



- ✓ optimizing timing and cost of winter maintenance operations



- ✓ new information and services to users



- ✓ platform services for e.g. meteorological and navigational trades

Test route in Turku

What, where and how?

- ▶ started in winter 2017-18
- ▶ a part of Civitas Eccentric project
- ▶ 12 kilometers long
- ▶ selected based on actual usage and numbers
- ▶ brushing and de-icing salt as methods

Goals:

- ▶ keeping the route free from snow and achieving a better grid
- ▶ increased numbers of winter cyclists
- ▶ collecting information about effectiveness of the tested method
- ▶ a follow-up for the pilot in the near future



Feedback from the test route users

- ▶ As a rule, the street operator and users have been pleased with the route. Operator has mentioned following notices from users:
 - 😊 route length (demand for more)
 - 😊 route attractiveness
 - 😊 increased safety along the route
 - 😞 rusting on bicycles
 - 😞 dirt on shoes
 - 😞 dirt on real estate entrances and corridors

Tools for monitoring

1) Stationary measurements on routes



IRS31pro-UMB (Intelligent Road Sensor)

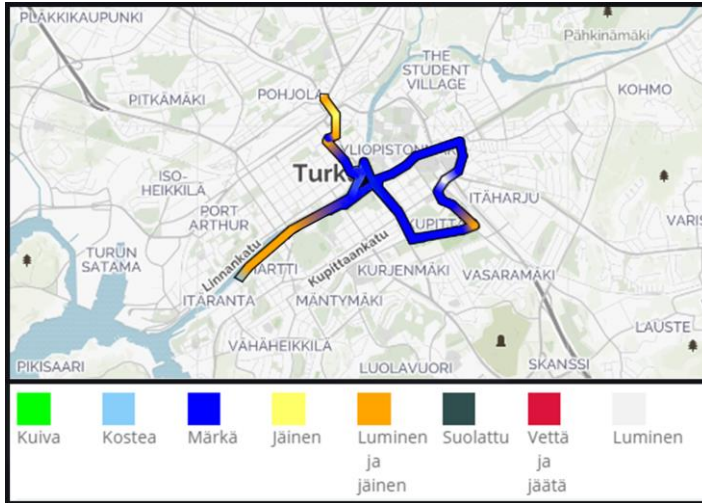
- ✓ temperature: surface, 5 cm, 30 cm
- ✓ water film height
- ✓ salinity: amount of salt and its quality
- ✓ condition status
- ✓ friction (calculated)

StaRWIS-UMB (Stationary Road Weather Information Sensor)

- ✓ temperature: surface
- ✓ relative humidity
- ✓ water film height
- ✓ dew point temperature
- ✓ condition status
- ✓ friction (calculated)



2) Mobile measurements in route



Suomen Kuntotekniikka Oy,
Antti Hirvonen 2.2.2018

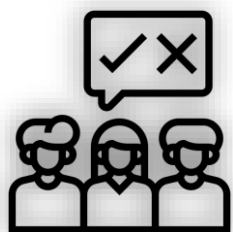


West Coast Road Masters Oy,
Juha-Matti Vainio 5.2.2018

Back then and currently

- ▶ no quality training for contractors
 - *contractors more committed to quality*
- ▶ no sensor data available
 - *route data provides real-time and reliable information*
- ▶ large amounts of unprocessed data
 - *smart presentations of big data*
- ▶ limited data sharing
 - *combining knowledge with different parties*
- ▶ many potential users missing
 - *leading the way towards platform economy*

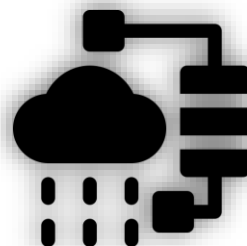
Let's put data to work!



1 1 1 1 1 1 1 1 1
0 1 0 1 0 1 0 1 0 1 0
1 0 1 0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1 0 1 0
1 0 1 0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1 0 1 0
1 0 1 0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1 0 1 0

Clear view?

0 1 0 1 0 1 0 1 0 1 0
1 0 1 0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1 0 1 0
1 0 1 0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1 0 1 0
1 0 1 0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1 0 1 0
0 1 0 1 0 1 0 1 0 1 0



Thank you for your attention!

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