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ENHANCED MOBILE FRICTION MEASUREMENT ON HIGHWAY 4

INNOMIKKO
CONSULTING

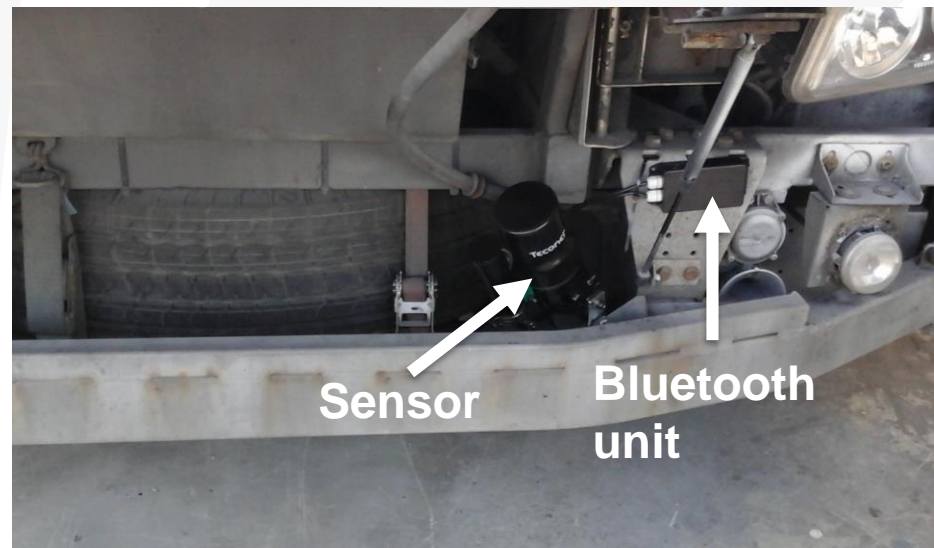
Enhanced mobile friction measurement on highway 4

Background

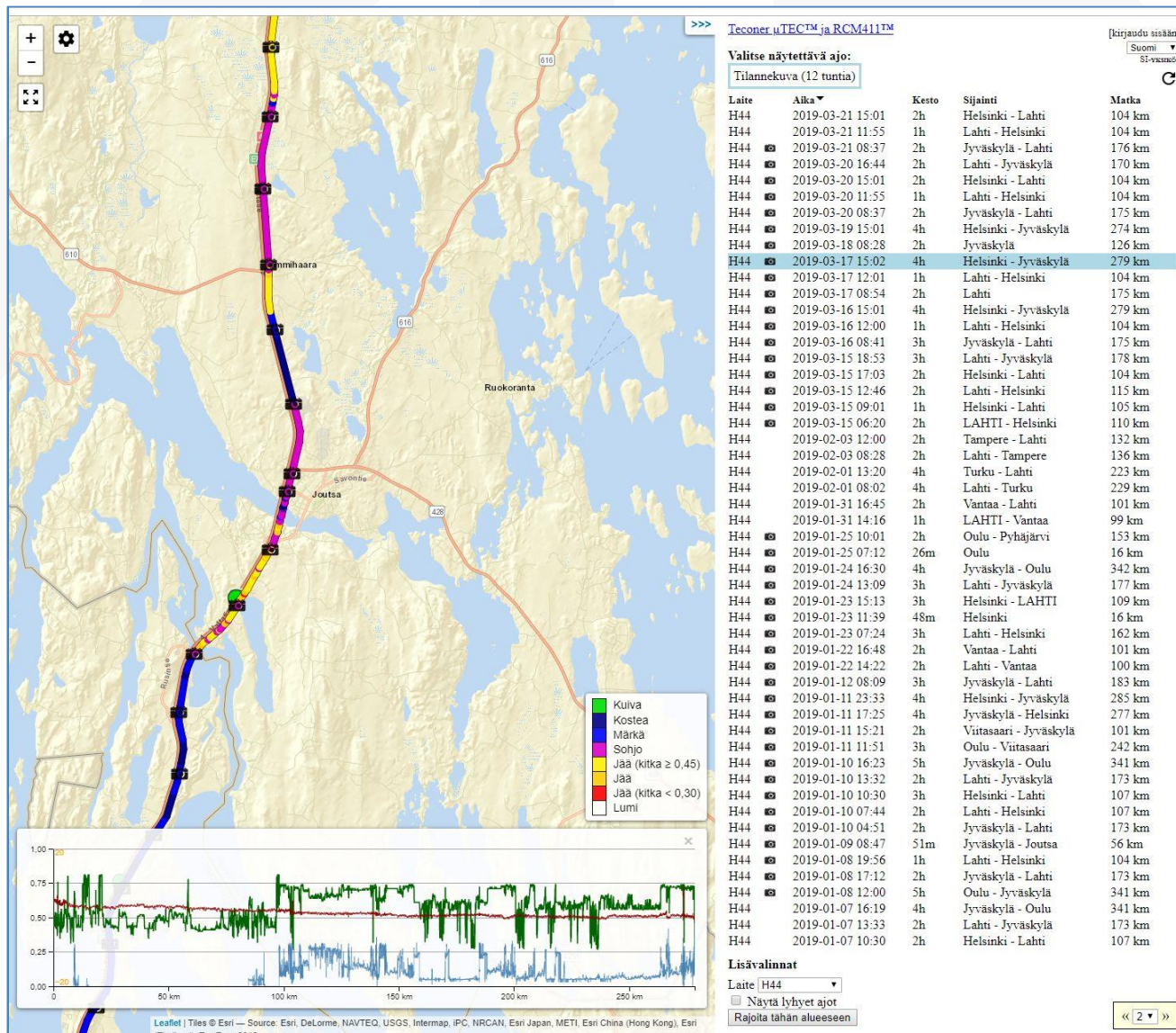
- The criticism of the winter maintenance on highway 4
- New law for roads: the road authorities should utilize the possibilities of new digital services
- The project was financed by North Ostrobothnia, Central Finland and Uusimaa Centres for Economic Development, Transport and the Environment. The Finnish Transport Infrastructure Agency will finance further analysis with project data.

Objective:

- To install 8 optical friction meters RCM411 on regular traffic between Helsinki and Oulu
- The measurements will cover at least winter seasons 2018-19 ja 2019-20, probably also 2020-21
- To study the reliability of the system and the benefits of collected data



https://roadweather.online/



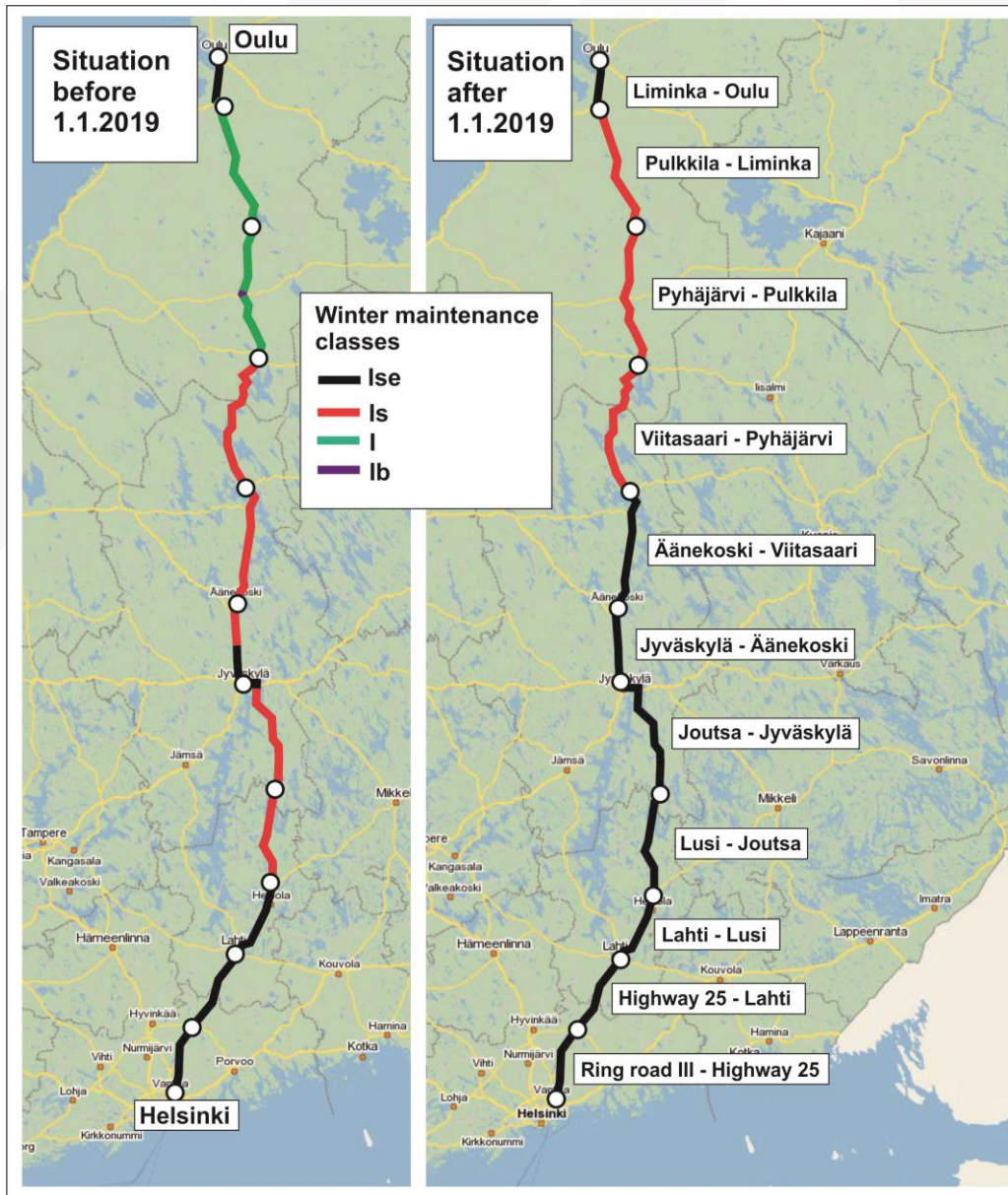
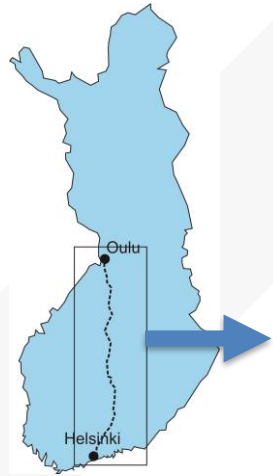
Fleet



- Four "Vähälä" trucks
- Four "Koiviston auto" buses during season 2018-19. One of the systems was moved to V.-Alamäki bus at season 2019-20

Technical performance

- Most of the problems were connected to the phone
- There were some problems with bluetooth unit in the first season and in the beginning of the second season, but now these problems seem to have solved
- During season 2018-19, snow once blocked one sensor
- When having 8 vehicles, typically 7 operated and 1 was in maintenance
- During spring 2019, there were sudden route changes in "Koiviston auto"
- The "cleaned" data amount: 470 000 km (1.10.2018-30.4.2019)



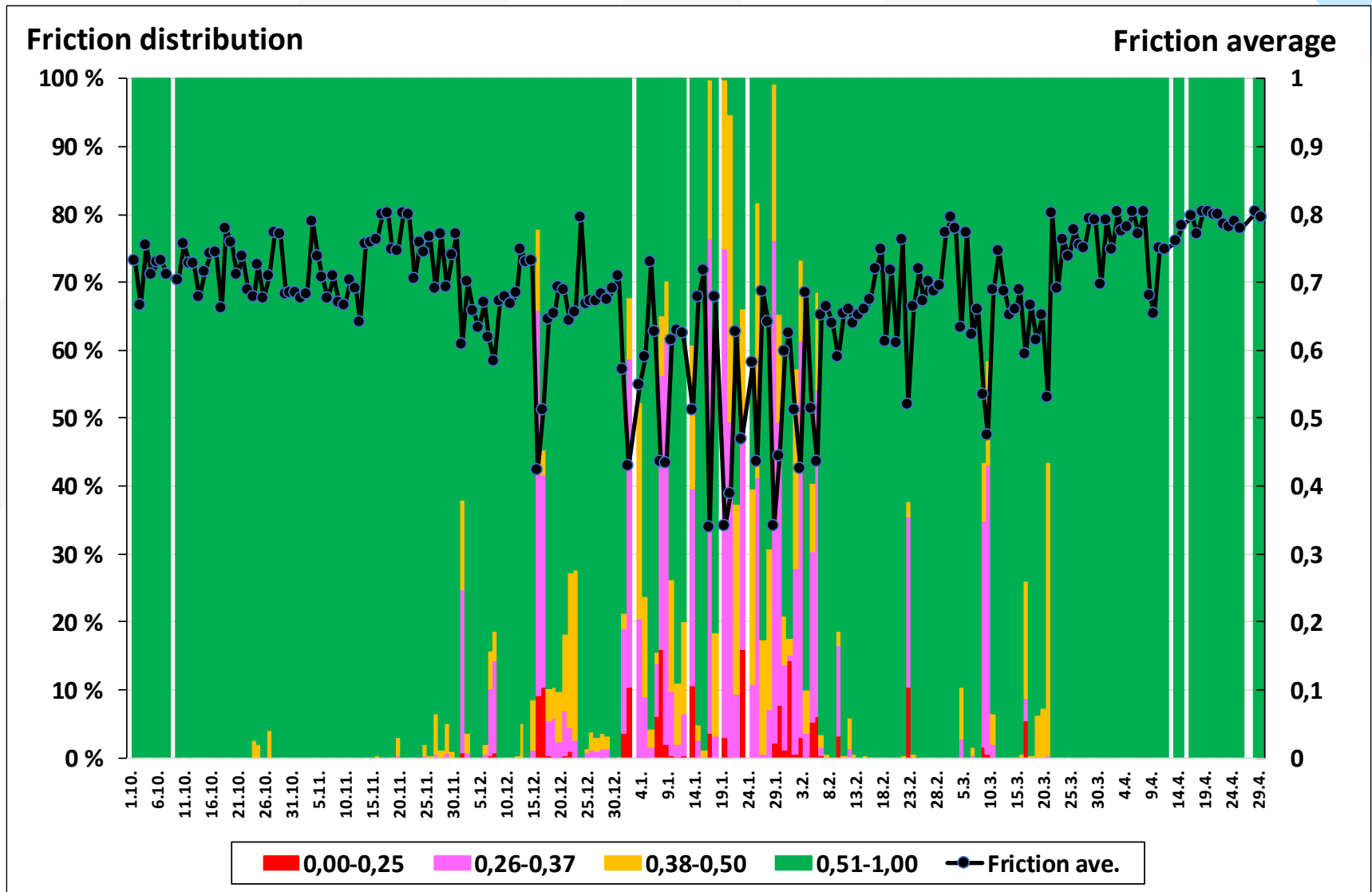
Ise and I

Friction demand 0,30
(RCM \approx 0,37).

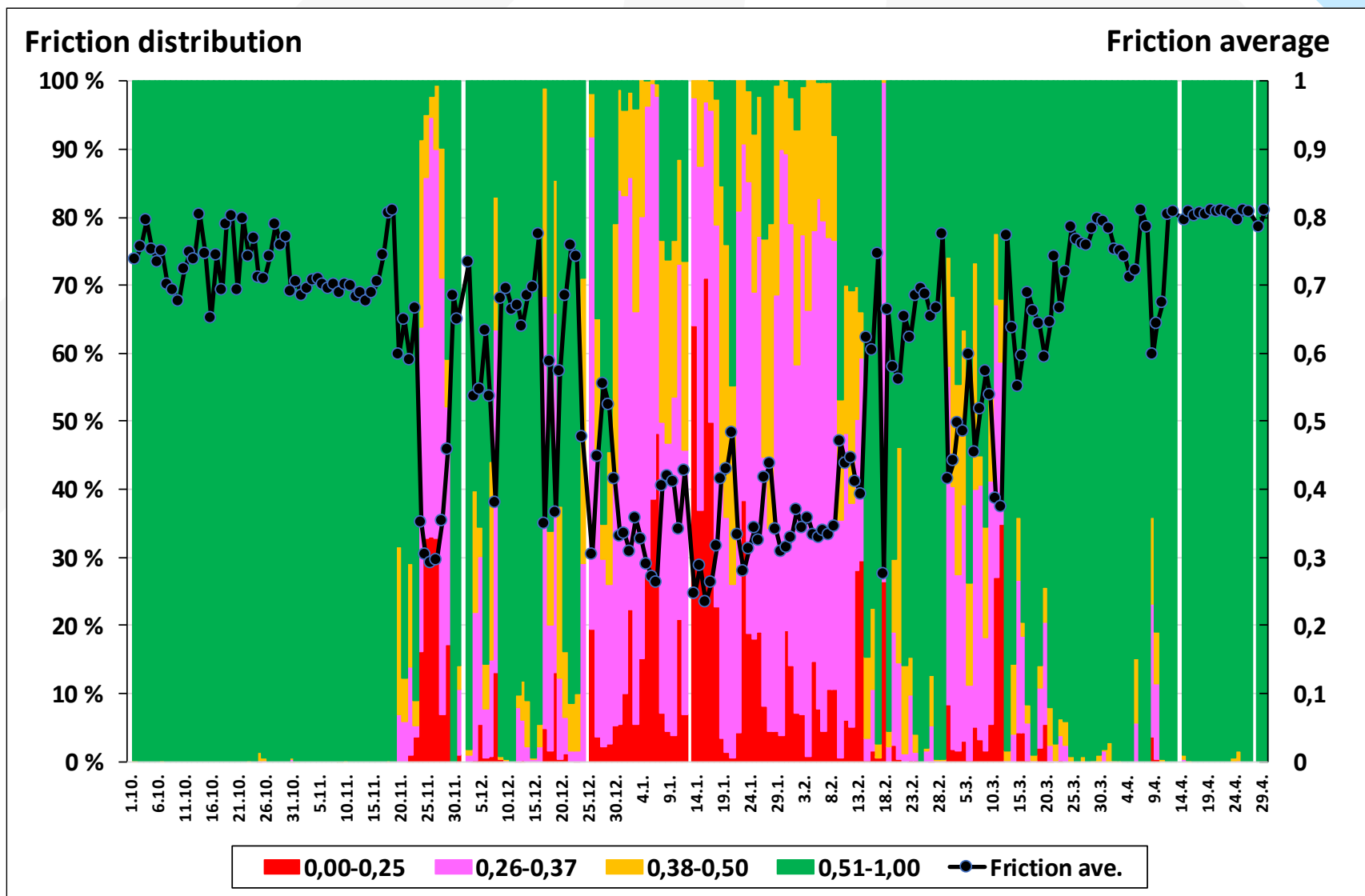
If temperature is below
-6°C, the demand is 0,25.
(RCM \approx 0,32).

Time to carry out measure
when falls below the
demand
Ise: 0 h, Is: 2 h.

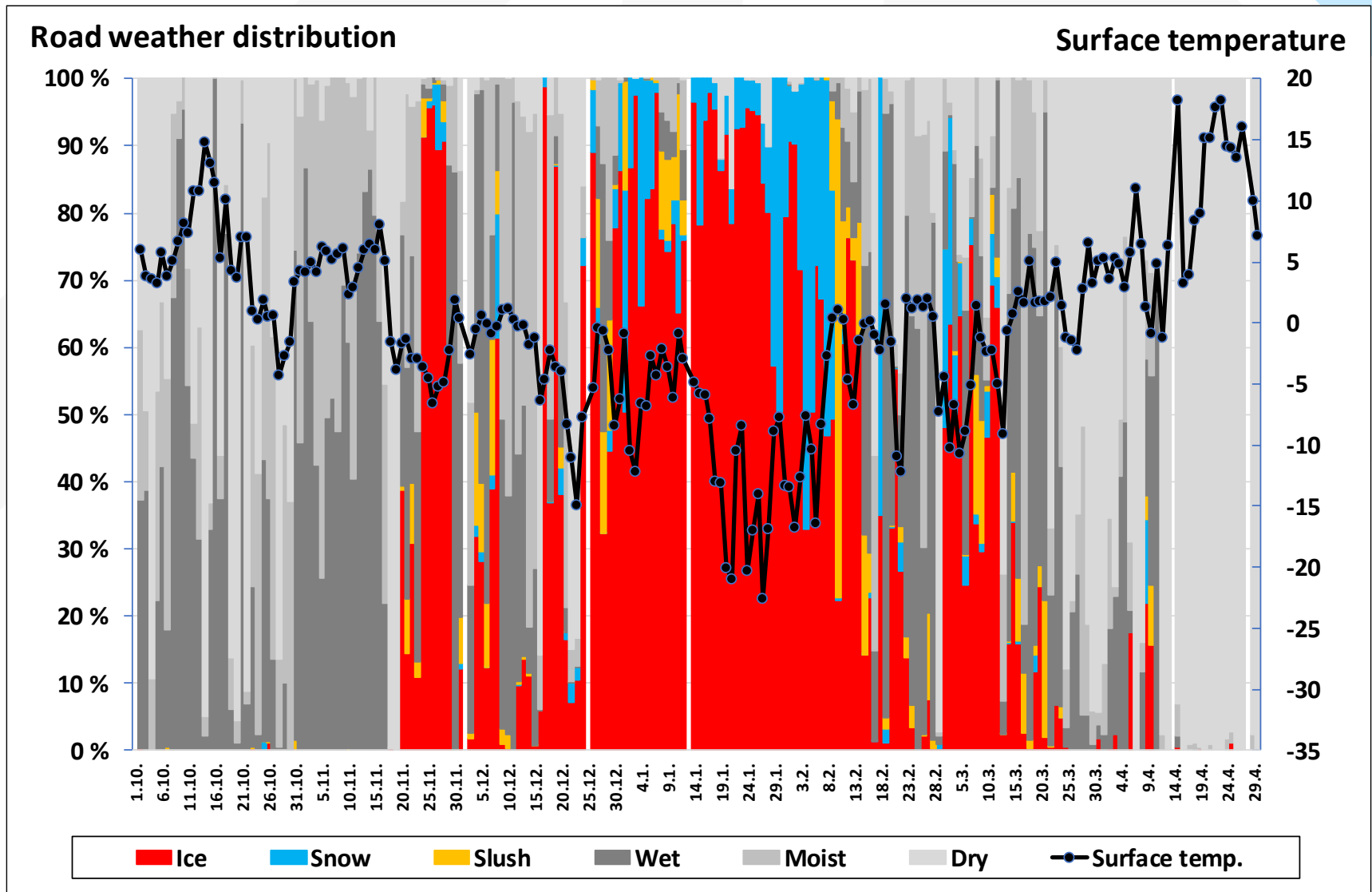
Road section "Ring road III – Highway 25", winter season 2018-19

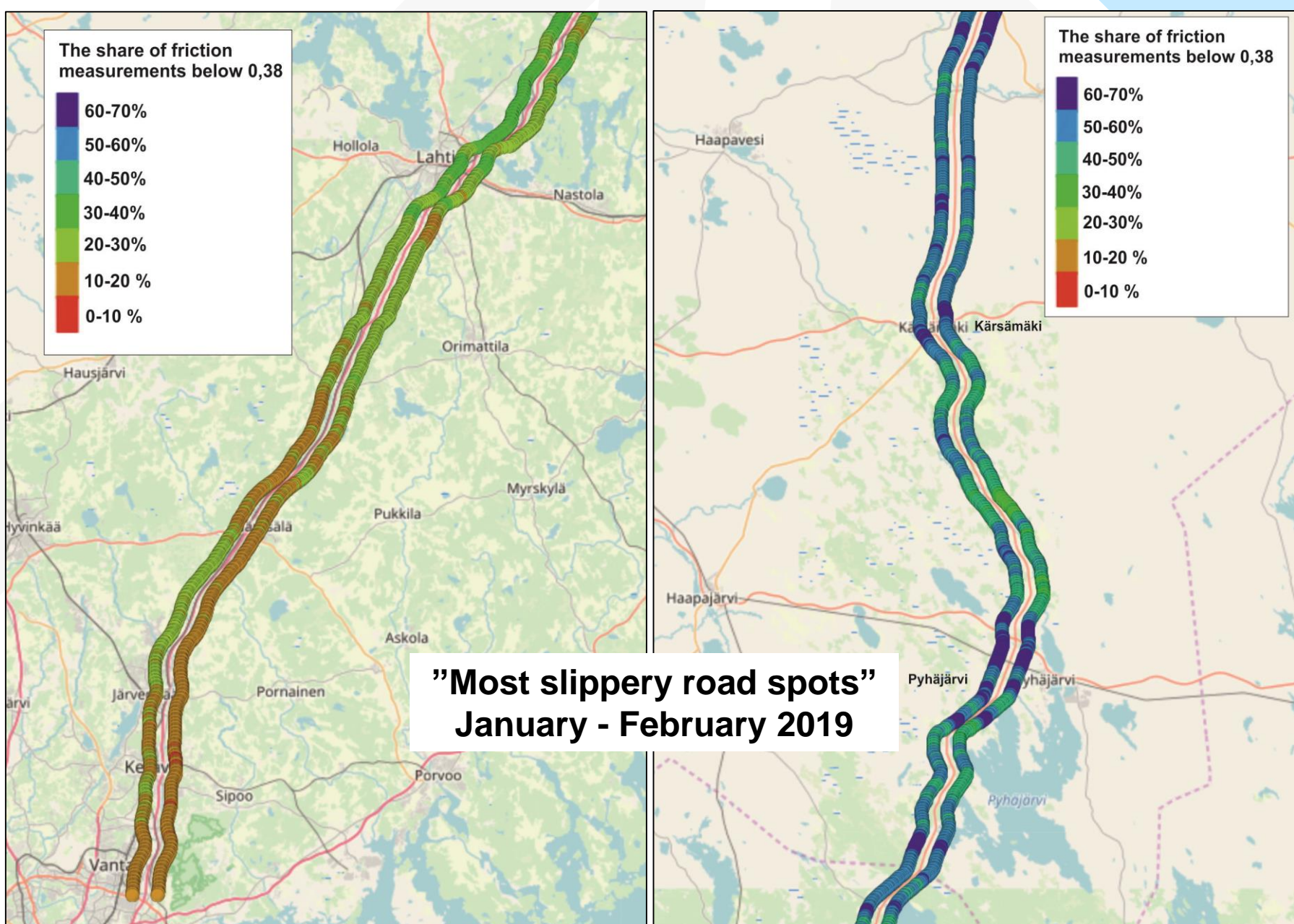


Road section "Pyhäjärvi-Pulkkila", winter season 2018-19



Road section "Pyhäjärvi-Pulkkila", winter season 2018-19





Summary and conclusions

- In this project, 8 optical friction meters RCM411 were installed on heavy vehicles operating regularly on highway 4. The study will gather winter seasons 2018-19 and 2019-20, probably also season 2020-21.
- The technical performance has been reasonable: the phone is not designed for continuous use. The preliminary object was to pay little extra for drivers as they look after the system. However, the big number of drivers in a single vehicle (especially in buses) made this object impossible. The system could be expanded, if the drivers could be engaged for system supervision.
- The possibilities to utilize the gathered data have been better than expected. The system has clearly pointed the road sections with most slippery conditions. The slipperiness in cold weathers, especially below -6°C , when the salt is inefficient, seem to be a remarkable problem. The effect of traffic volumes seems also be clear: the slipperiness happens most often in low traffic road sections, even when compared to high traffic road sections with the same road maintenance class.
- The public report will be published in The Finnish Transport Infrastructure Agency internet pages at summer 2020.

Thank you!