



Trafí

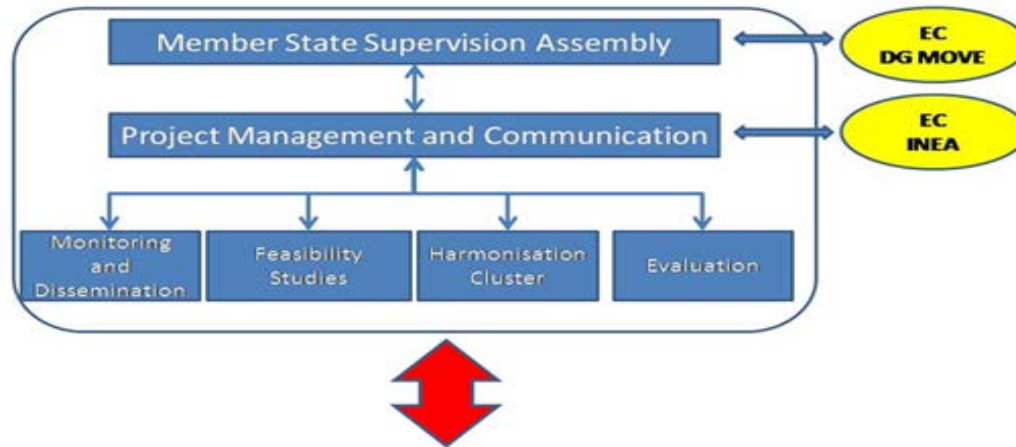
Finnish Transport Safety Agency

Connected and Automated Vehicles for All Conditions – Challenges of Accurate Positioning and Location

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Special adviser
New mobility services and
R&D*



European ITS Platform 2016 - 2020



The 5 ITS Road Corridors projects



- Involves national ministries, road authorities and operators, other partners from almost all EU Member States and neighboring countries
- Cooperating to foster, accelerate and optimize current and future ITS deployments in Europe in a harmonized way.

European ITS Platform – A4.2. Facilitating automated driving



The main tasks of the activity are to:

1. Identify the requirements of higher level (SAE 3-5) of automated driving for road authorities/operators
2. Assess the direct and indirect impacts of higher level automated driving on traffic, mobility and the core business of road authorities and operators; investigate the socio-economic benefits and costs of automated driving from the road operator's perspective
3. Provide a road map and action plan, focussing on the needs of road operators to facilitate automated driving on the TEN road network
4. Identify the requirements of automating road operator ITS to facilitate automated driving and automation level of traffic centre operations and services
5. Monitor, liaise and disseminate



Where's the lane? Self-driving cars confused

02.23.18

Smart Roads Could Protect Us From Self-Driving Car Crashes

The cars will protect the passengers. But who's looking out for the walkers, cyclists, and other people nearby?

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Richard Truett

Technology and Engineering Reporter



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The other bump on path to driverless cars: Crumbling roads

August 30, 2016 @ 11:30 am

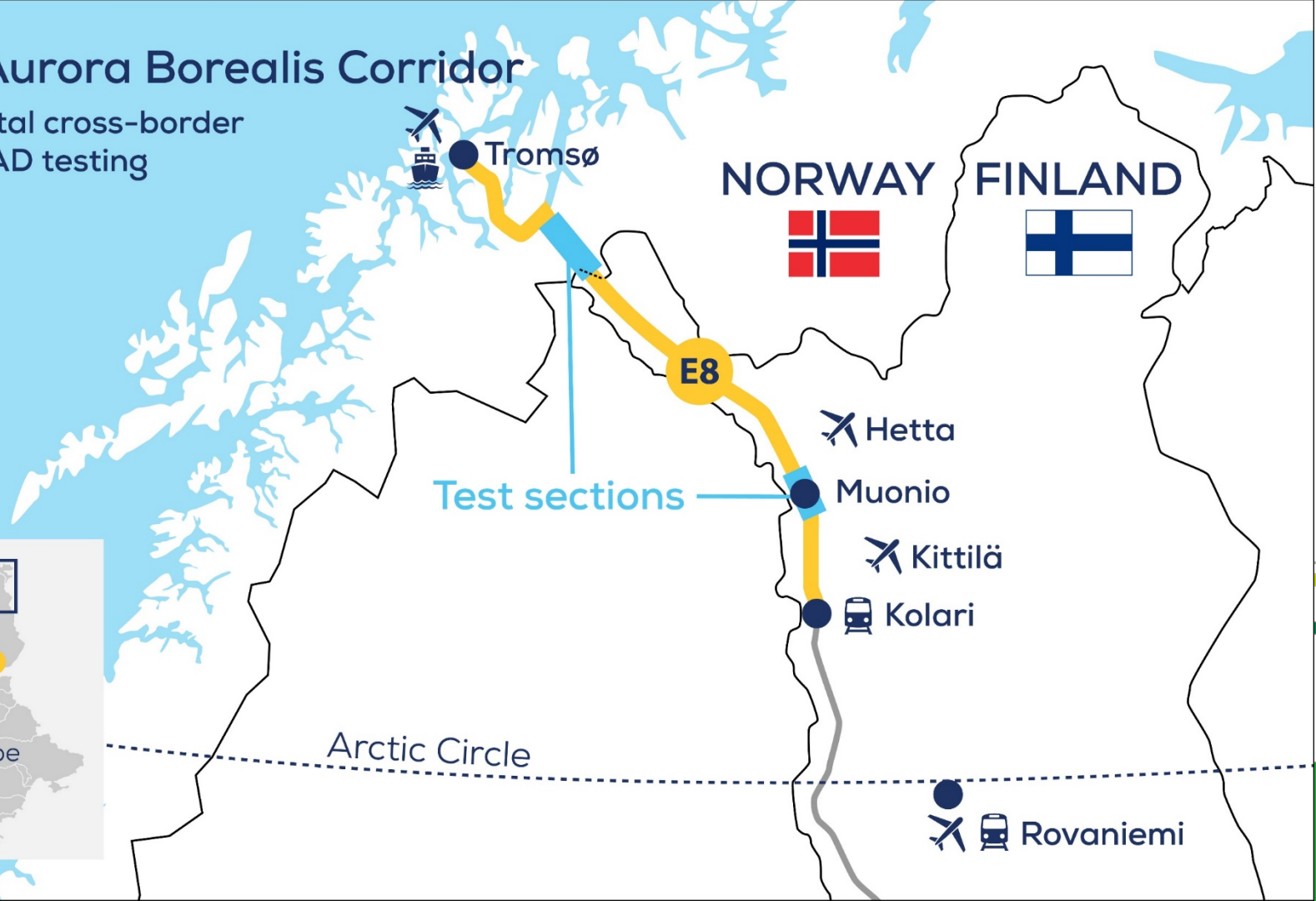
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Shares





E8 - the Aurora Borealis Corridor

European digital cross-border
corridor for CAD testing



PUBLIC SERVICE PLATFORM FOR TESTING

- 10 km of instrumented road on the E8
- Instrumentation and information services supporting testing of ITS, CAD and asset management in road traffic
- Open test ecosystem creating opportunities for developing technologies to work in all conditions
- Testers can utilise the test ecosystem free of charge.



Challenges for positioning and navigation in arctic conditions

- Coverage of GNSS constellations and satellite- or land-based augmentation systems is not optimal
- Access to radio navigation (other than GNSS) and communications is limited
- Atmospheric modelling
- Availability and quality of maps
- Presence of ice and snow
- **The challenge is to attain similar levels of navigation performance and reliability as in lower latitudes**

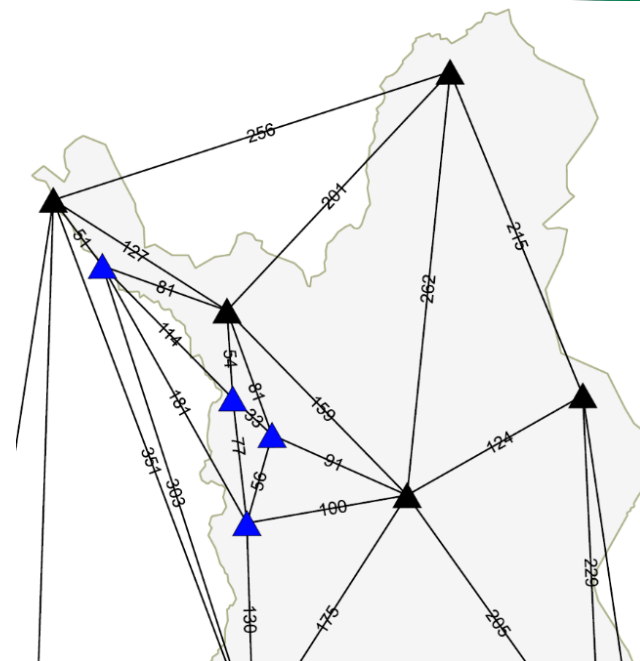


Source: Finnish Transport Agency



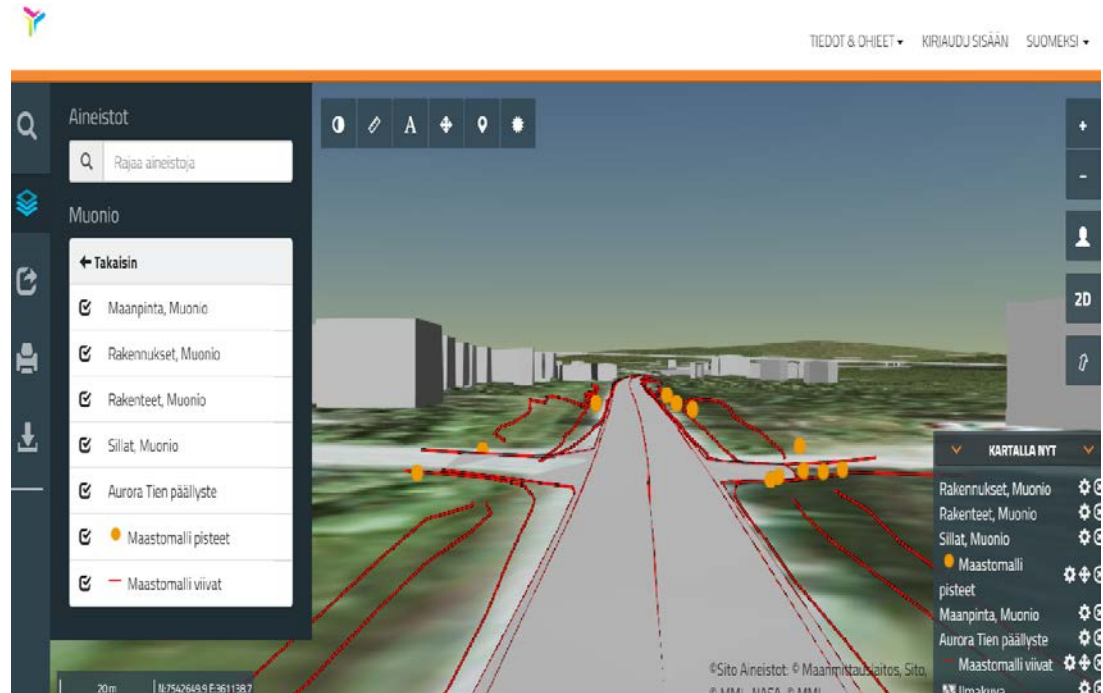
Aurora: location and positioning

- No single positioning technology is sufficient for automated driving.
- Single technology approaches lacks the necessary accuracy and robustness for safety critical applications
- Aurora positioning service offered by National Land Survey of Finland
 - Bases on Finnref-correction services
 - 4 new Finnref stations were installed alongside the E8 highway in 2017
- In the measurements carried out during 2017 location accuracy with the correction signal on E8 was less than 7 cm in more than 90 % of the time



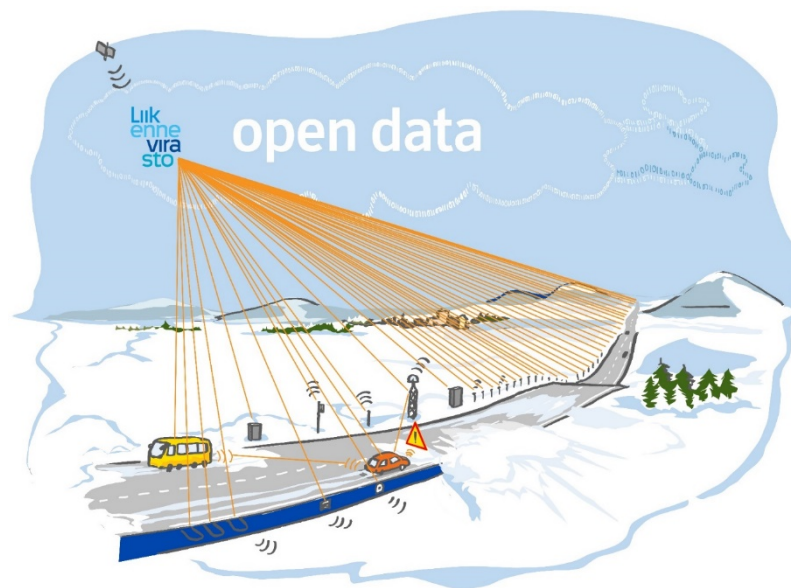
High-definition map

- Based on the static data from the Finnish Digiroad system
- and
- Laserscanning data from the area
 - No dynamic layer available



Data generated by instrumentation

- All data available as open data through Digitraffic service (Aurora PoC)
- Sensors: vibration, weight, pressure, acceleration, oscillation frequency, road surface slipperiness, measuring and monitoring of the road structure and condition, traffic volumes
- Real-time information about road conditions (incl. frost sensor and radiometer) generated by road weather stations



R&D: The Arctic challenge 2017 - 2019

- R&D for intelligent infrastructure and road vehicle automation solutions and their performance and impacts in Arctic conditions
- Bases on Road transport automation Road map and action plan 2016 – 2020
- Research areas:
 - Physical infrastructure (landmarks)
 - Communications
 - Location data and positioning
- 3 consortia:
 - VTT Technical Research Centre
 - Sensible4
 - Lapland University of applied sciences



Ale Lintaho
Fanny Muhti
Road Transport Automation
Road Map and Action Plan 2016-2020



R&D: The Arctic challenge 2017 - 2019

The CAD coalition



Research focus:

- Hybrid communication and C-ITS Day 1 services

View Video

<https://www.youtube.com/watch?v=WfbkpPS-qss&feature=youtu.be>

R&D: The Arctic challenge 2017 - 2019

The Sensible4 coalition:



Research focus:

- Location data and positioning of vehicle

View Video

<https://www.youtube.com/watch?v=tEDMm7x9ONk>

R&D: The Arctic challenge 2017 - 2019

- The Lapland university of applied sciences coalition:



- Research focus:
 - Posts and poles for guidance and positioning

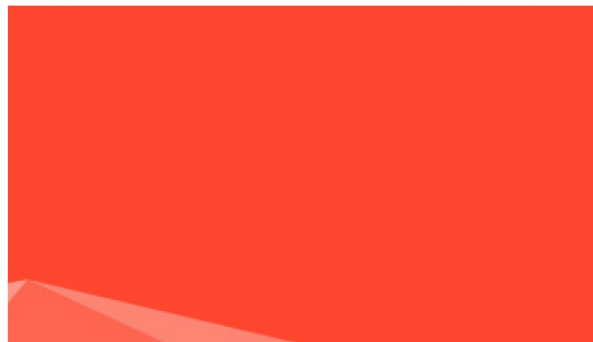
Chris Händel • Heikki Konttaniemi • Matti Autioniemi

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State-of-the-Art Review on Automotive Radars and Passive Radar Reflectors

Arctic Challenge research project

LAPIN AMK ROADSCANNERS Liikennevirasto Trafi aurora Co-financed by the European Union Connecting Europe Facility




Avoim liikennedata Suomessa



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