Smart and Sustainable Traffic in Challenging Conditions

Finnish Transport Agency
Deputy Director General
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Three main themes:

- The traffic revolution - three predominant trends
- Intelligent road traffic
  - Case pilots: Aurora and Nordic Way
- Smart and sustainable vessel traffic in arctic conditions
  - Case: Baltic Sea
The field of transport and mobility is undergoing tremendous changes

- mobility is transforming into a service, MaaS
- data volumes and utilisation are rapidly increasing,
- automation and robotisation are influencing the modes of mobility.
“We have an idea for something which is not exactly a bus, but would solve the density problem in intercity situations. I think we need to rethink the whole concept of public transport and create something that people are actually gonna like a lot more. I don’t want to talk too much about it.”

Sinä uudelleentiittasit

Anne Berner @AnneBerner

The Future of public transport is door to door service with autonomous vehicles @elonmusk #liikennekaari
Test areas in Finland

**Aurora (Muonio, Ylläs)**
- Closed and open area
- Automated, winter testing + MaaS

**Kymiring** (Kouvola)
- Closed circuit
- Racing cars, automated

**NordicWay (Helsinki-Turku, Ring I and Ring III)**
- Motorway
- Cellular Cooperative ITS, V2I and I2V

**City of Tampere**
- Intersection, tunnel, parking
- Automated

**Oulu**
- Work machine automation

**Northern Finland**
- Test tracks and testing facilities
- Winter testing

**Functional testing (Rajamäki)**
- Closed area
- Vehicle pre-testing

**Kymiring** (Kouvola)
- Closed circuit
- Racing cars, automated

Helsinki Metropolitan Area
Would You Trust A Self-Driving Car In A Snowstorm?

Think about the above question this weekend, whether you’re inching your way through snow-packed traffic or merely watching the big blizzard unfold via television news reports while sitting toasty and warm at home.

The first wave of self-driving cars will essentially employ an array of cameras and sensors as electronic eyes in what’s expected to be an advanced cruise control system for primarily highway driving to keep a car centered within lane markers, maintain a set speed and distance from traffic ahead, anticipate and slow the car down for curves in the road, and so forth. Eventually, autos should be able to operate as if they had invisible chauffeurs behind the wheel, picking us up at the front door, dropping us off at work, and then parking at a tennis court, or site parking lot to save a few bucks.
Intelligent highway E8

The improvement of highway E8 is underway to meet the requirements of a public test area.

1. Arctic testing for intelligent transport automation
   Technology test sites in real winter conditions with a broad selection of services

2. Digital transport infrastructure and connected cars
   Accurate information on road events to all road users to enable safer driving, connected driving and analytics for traffic management

3. Intelligent infrastructure asset management
   Data collection to enhance traffic management and refine maintenance processes in the era of automation

4. Mobility as a Service
   Flexible and affordable mobility services for tourists and locals without car dependency
Aiming for **safer roads**: receive and share **road safety Information** via **cellular network** when on the road

Co-financed by the European Union
Connecting Europe Facility

Picture: Wikimedia Common, S. Solberg J.
Day 1 cellular C-ITS Safety Related Traffic Information (SRTI) messages

- Finland, overall of 6 Traffic Management Center (TMC) and mobile originated SRTI messages
  - 3 Mobile originated SRTI messages: visibility, obstacle and accident
  - 6 TMC originated

- Sweden and Norway, 3 vehicle originated SRTI messages
  - Temporary slippery road (Norway)
  - Hazard warning (Sweden)
  - Road works warning (ITS-G5) (Sweden)

- Denmark, provides SRTI to the NordicWay
Safe and sustainable maritime traffic in arctic conditions
The Baltic Sea is challenging for navigators

- Narrow straits, shoal and shallow waters.
- Average depth only 55 m (Gulf of Finland only 38m).
- Busy waters with a lot of crossing traffic.
- Ice conditions hamper winter navigation.
- Gulf of Finland is ice-covered for approx. 100 days annually.
Vessel Traffic Services significantly reduce the risk of accidents

GOFREP

• Collects information about shipping and dangers to navigation.
• Shares information with vessels to increase safety and efficiency.
• Supports Winter Navigation.
• Monitors vessel traffic. Reports of violations are sent to the vessel’s flag state.
• All information and violation reports are shared using the Finnish-Estonian-Russian GOFREP reporting system.

The aim is to improve vessel traffic safety and efficiency.
The service is based on proactive intervention to prevent dangerous situations.
Vessels in the Gulf of Finland also adhere to a mandatory ship reporting system, GOFREP (Gulf of Finland Reporting). Trilateral system operated by Estonia, Finland and the Russian Federation.
Intelligent fairways
A step towards autonomous vessel traffic

The VTS Centre ensures electronically that vessels’ routes are safe and efficient.

The vessel receives up-to-date digital weather reports and forecasts.

The vessel receives up-to-date digital water level data and forecasts.

Aids to navigation adapt to conditions and vessel movements.

The vessel receives seabed data.

Benefits
- Facilitated route planning and navigation.
- Improved cost-effectiveness and optimised cargo volumes.
- Enhanced safety through reduced risk of groundings and collisions.
Polaris represents a new generation of icebreakers. It is the world’s first icebreaker powered by liquefied natural gas (LNG). The use of both LNG and low sulphur diesel reduces the vessel’s emissions significantly, making it also the most environmentally friendly diesel-electric icebreaker ever built.
Thank You!

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