



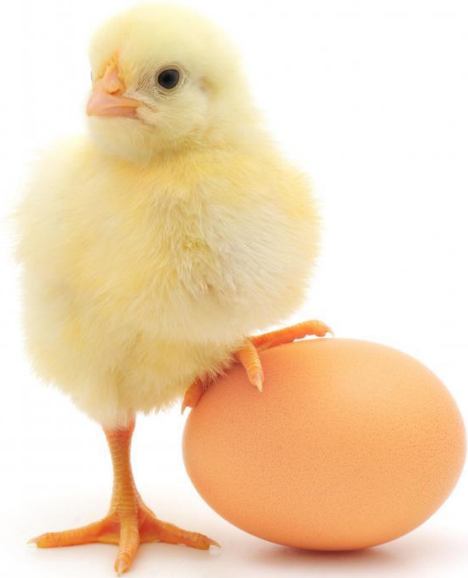
Reija Viinanen  
Director Aurora collaboration  
Finnish Transport Agency

The logo for Aurora, featuring the word "aurora" in a white, lowercase, rounded sans-serif font. The letters are thick and have a slightly irregular, hand-drawn feel. The background is a dark blue gradient with a pattern of lighter blue circles of varying sizes, creating a textured effect.

**AURORA BOREALIS INTELLIGENT  
CORRIDOR  
AND TEST ECOSYSTEM FOR CAD**

SIP-adus Workshop 2017, Tokyo

# “Hen and egg dilemma”



Source: wiseGEEK

Does the infrastructure have to adapt to the new automated vehicles (CAV) and electric car technologies?

or

Do the car manufacturers understand that they have to develop the CAVs for all conditions and different types of roads?



Forbes / Autos

JAN 22, 2016 @ 12:25 PM 4,353 VIEWS

# Would You Trust A Self-Driving Car In A Snowstorm?



**Jim Gorzelany**  
CONTRIBUTOR

I write about how to

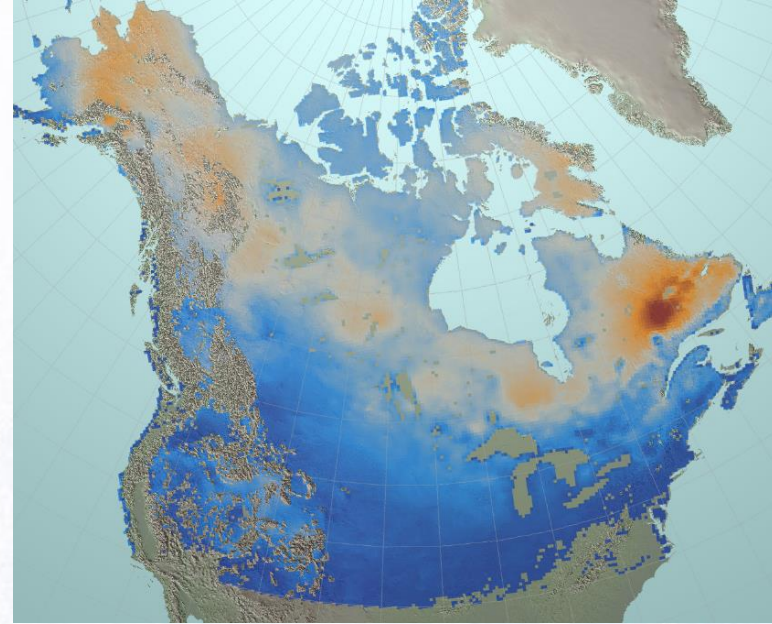
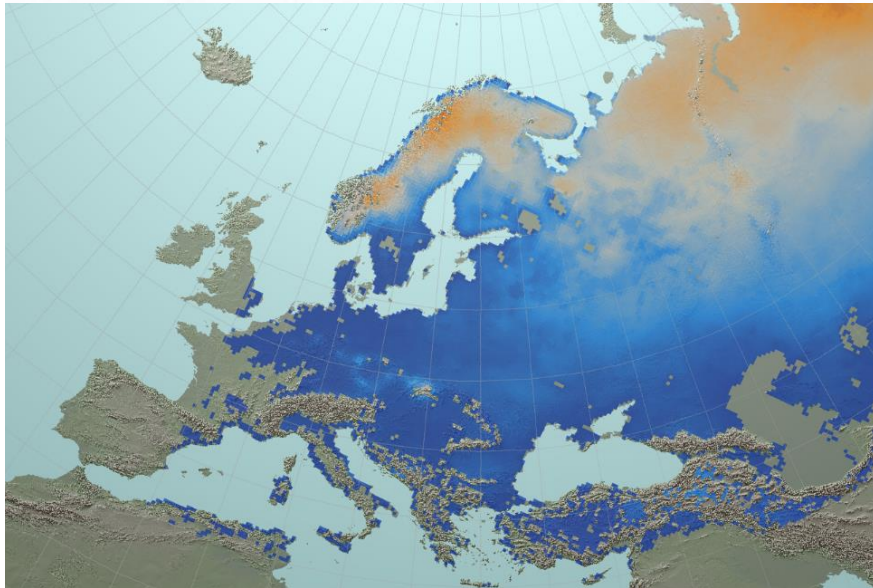
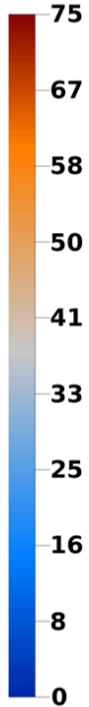
Think about the above question this weekend, whether you're inching your way through snow-packed traffic or are merely watching the big blizzard unfold via television news reports while sitting toasty and warm at home.





# January snow belt in Europe, Canada and USA

Snow Depth  
[cm]



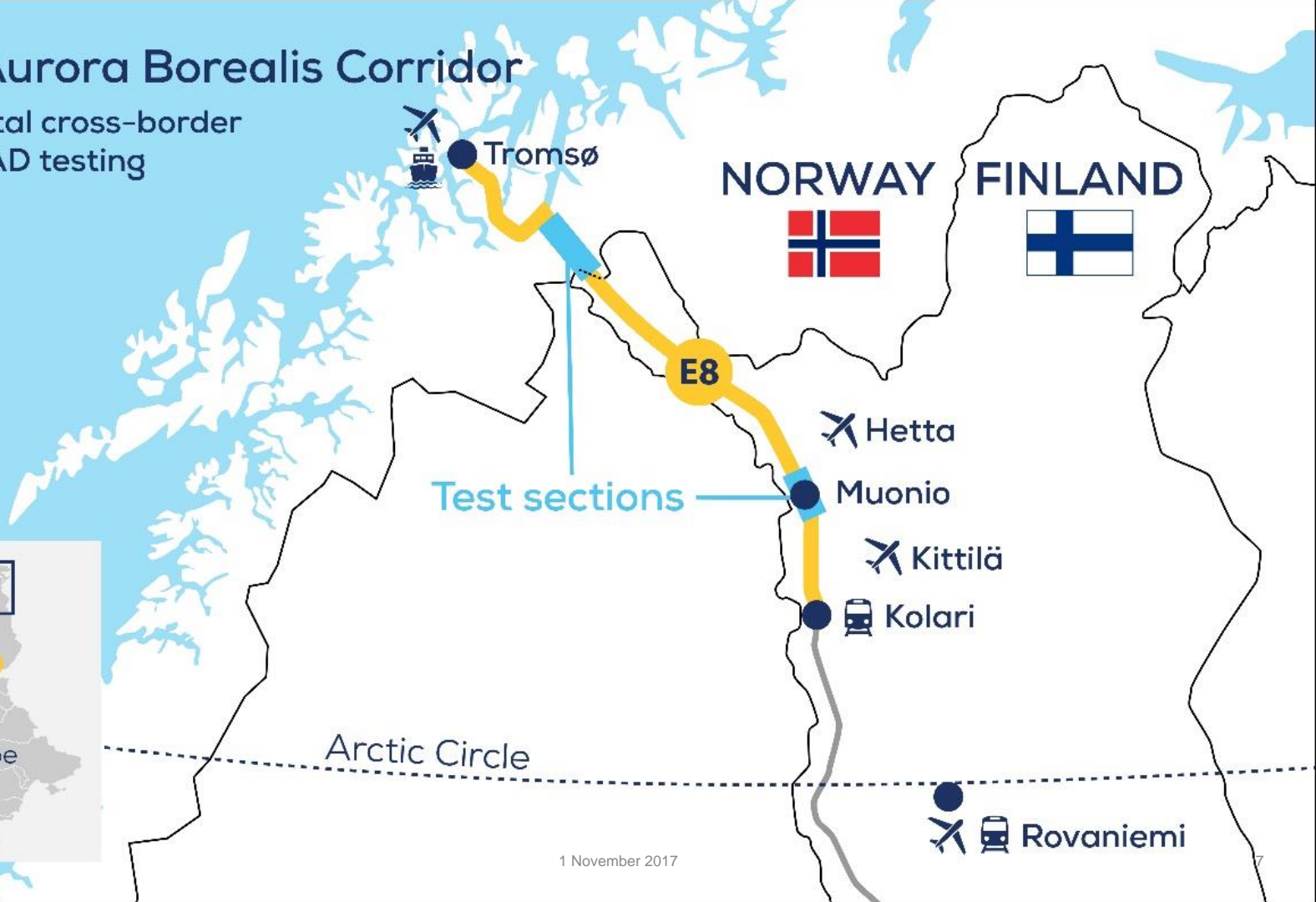


FROM AUTONOMOUS DRIVING TO  
**SNOWTONOMOUS DRIVING**



# E8 - the Aurora Borealis Corridor

European digital cross-border  
corridor for CAD testing









## Connected vehicles

Advance traffic safety and automated driving by collecting and forwarding information of road, traffic and weather conditions as well as disturbances and disruptions on the road.

## Information services

5G test network, precise positioning with reference stations and HD map services available.



## Automated driving

In snowy and icy extreme weather conditions.



## Intelligent Road

Digital and physical infrastructure support testing of automated driving, ITS and intelligent infrastructure asset management solutions.



1

Aurora facilitates testing of automated driving, ITS and intelligent infrastructure asset management solutions.

2

Automated vehicle trials are allowed in road traffic in Finland.

3

Test ecosystem enables testing on public roads and on closed tracks.

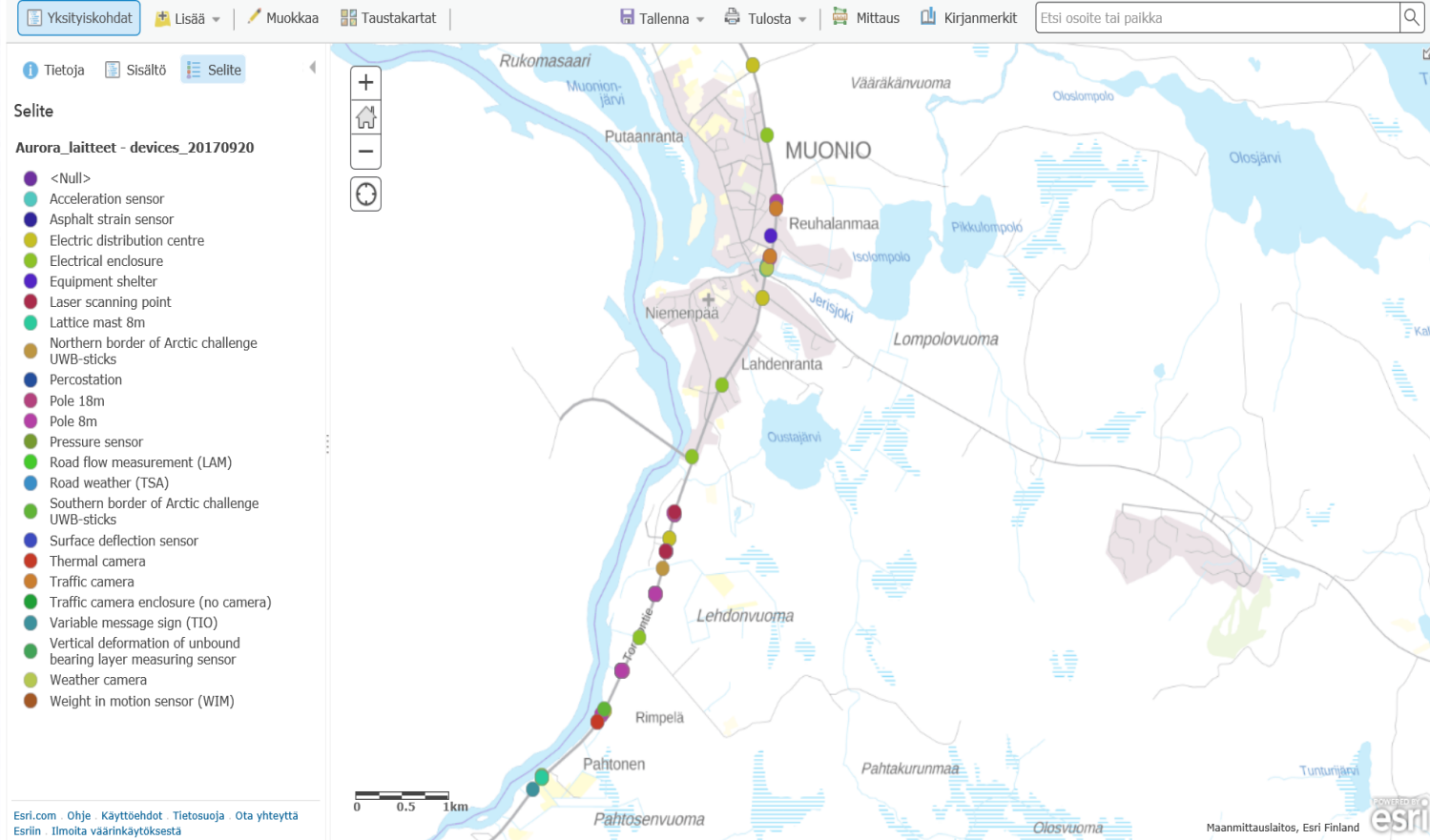
# WHY AURORA BOREALIS?

- Automated driving will not become widespread without weather-proof technological solutions.
- Aurora Borealis test ecosystem enables testing on closed tracks and on public roads in extreme weather conditions of the Arctic.
- Aurora Borealis offers a unique platform for public and private sector to cooperate, trial and pilot intelligent transport automation solutions and innovations.

# TESTING ON PUBLIC ROADS

- Automated vehicles can be tested on Finnish public roads
- Testing high automation vehicles (level 4) using test licence plates
- The test vehicle must have a designated driver – but **NOT** necessarily inside the vehicle







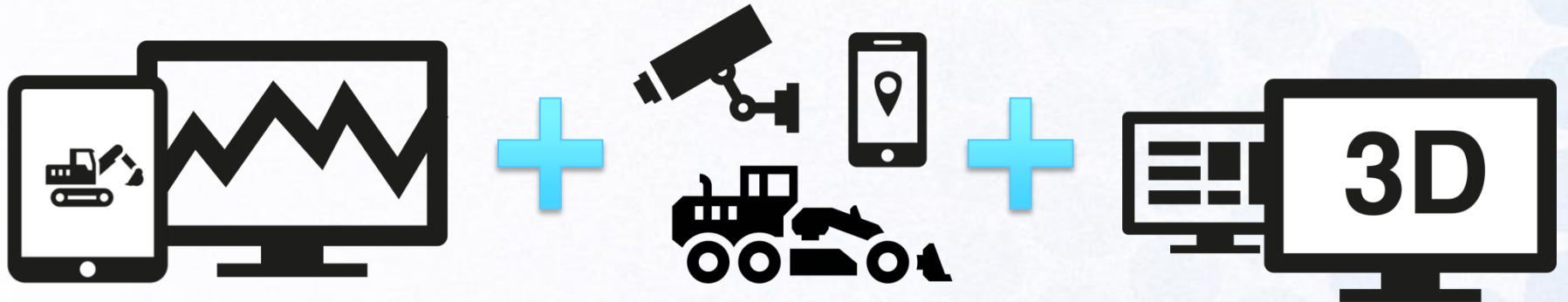
# THE ARCTIC CHALLENGE 2017-2019

- Study for intelligent infrastructure and road vehicle automation solutions and their performance and impacts in snowy and icy conditions
- Examples of research areas:
  - Physical infrastructure
  - Communications
  - Location data and positioning
- Technical performance of the solutions will be verified with field trials using automated vehicles



# THE INFRA CHALLENGE

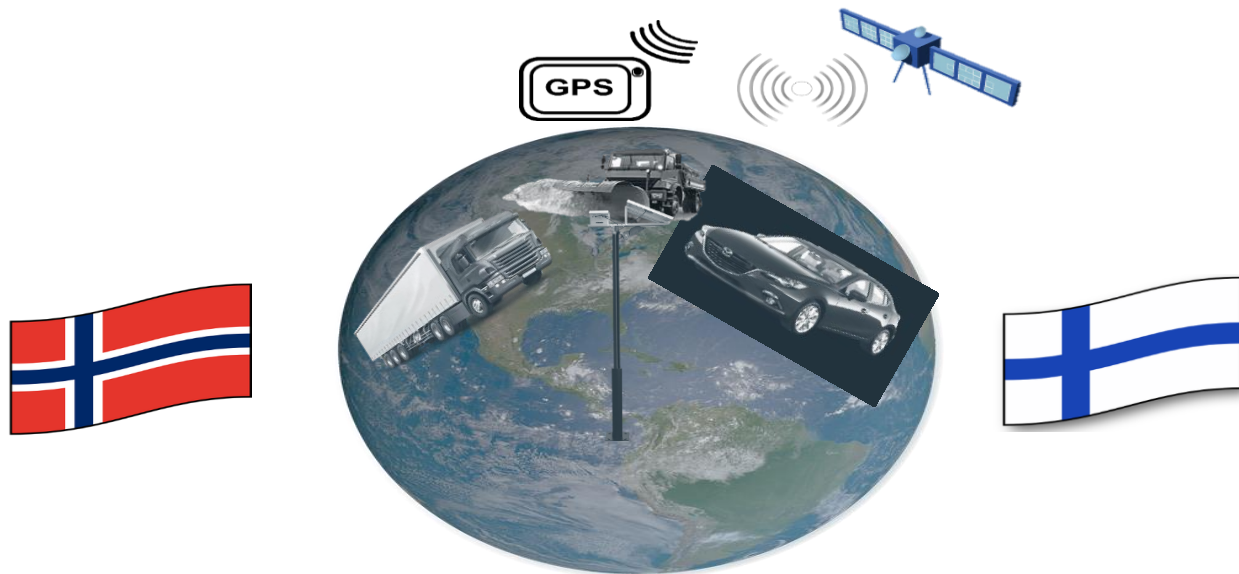
- How roads should be instrumented to support intelligent infrastructure asset management and CAD?
- How connected and automated driving will be affecting the wearing of the road?
- How new technologies can be utilized to automate maintenance and data collecting processes?
- Impacts on planning, building, maintenance and operation





Statens vegvesen

# AURORA BOREALIS INTELLIGENT CORRIDOR







# Borealis Project area



Statens vegvesen  
Norwegian Public Roads  
Administration





## Borealis Project area



**Statens vegvesen**  
Norwegian Public Roads  
Administration

- Important road for tourism and for business/ industry in Northern Norway
- Road transport on the E8 is dominated by freight transport between regions and to other countries, approx. 26 %



# E8 Skibotn

- Traffic counting
  - Camera
- Travel time registraton system
  
- 650 m new road – testsection
  - Fiber Optic Acoustic Sensor (traffic registration)
- Travel time registraton system
  - Camera
- Different systems for Weight In Motion(WIM)
  
- Weatherstation
  - Camera
- Traffic counting
- Travel time registraton system
  
- Fiber Optic Acoustic Sensor (trafficrogistration, stop in traffic)
  - Weatherstation
    - Camera
  - Traffic counting
- Travel time registraton system



- Information board
- Camera
- Chain station

- Information board
- Travel time registraton system
  - Chain station

- Reisetidssystem
- Weatherstation/camera
- Travel time registraton system
- Weatherstation/camera
- Travel time registraton system

**R&D 2018** →

**Planned in 2017**  
**Planned projects**

- **6 months winter season**
- **Polar night 25 days**
- **116 days below -10°C (14 F)**
- **51 days below -20 °C (-4 F)**
- **10 days below -30 °C (-22 F)**
- **Snow thickness between 0,5 -1 m (2-4 ft)**



Aurora DS

Aventi

Centria  
AMMATTIKORKEAKOULU

CLEANOSOL

DESTIA



esa

Elinkeino-, liikenne- ja ympäristökeskus

HELSINKI BUSINESS HUB

here

DIGIPOLIS

INNOFREAKS

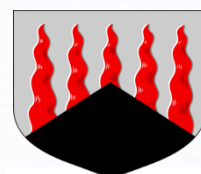
Enontekiö



ELTEL infoTripla



ILMATIETEEN LAITOS



Kartverket

FORUM IRIUM HELSINKI

FORECA

OULUN YLIOPISTO



Metropolia

ITS Finland

Kolari

Liikennevirasto

OULUN ENERGIA



URAKOINTI



Trafi

Liikenteen turvallisuusvirasto



MML  
PAIKKA-TIETO-KESKUS FGI



Finnish Transport Agency

LAPIN AMK  
Lapland University of Applied Sciences

LPG

SMART AND GLUE

Teconer



Solarex

SITO

tietomekka

Muonio

MillieMallie

PayIQ



sensible 4



RoadCloud  
WAY AHEAD



Statens vegvesen

traffic  
by mediamobile

VAISALA



RAMBOLL

Viestintävirasto

VIONICE

Paliskuntain yhdistys



SHARE IT  
BLOX CAR

YIT

yssp a dypnniq company

VTT

YLLAS

# Flying cars need no infrastructure?



Source: BAC



AURORA  
SUMMIT

OLOS  
16.-17.1.2018