



Statens vegvesen
Næringslivets Public Service
Ansvarstaker




The National ITS Pilots

Tomas.Levin@vegvesen.no



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NPRA ITS Program



Cool, we have money but for what ?

An envisioned future

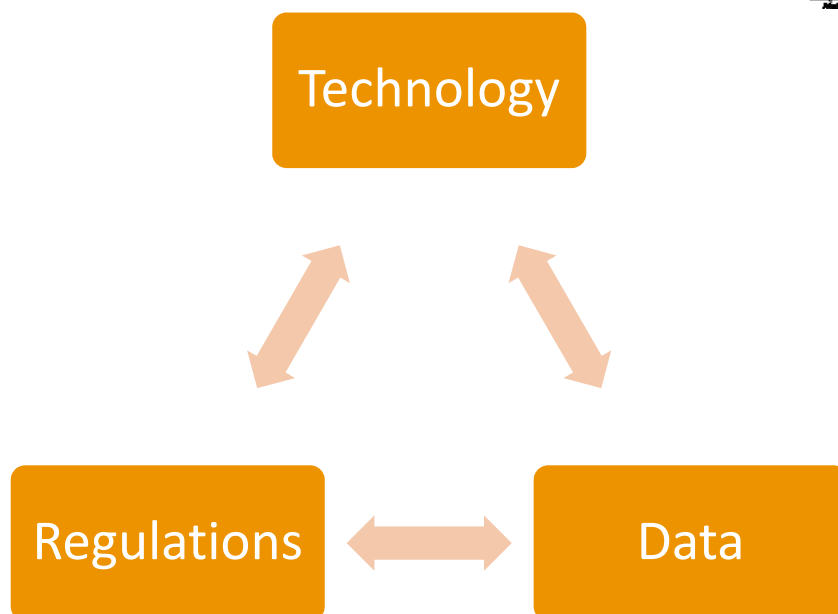


Figur 3.2 Et mulig fremtidsbilde for mobilitet i by – "Clean and shared"

Kilde: Illustrasjon gjengitt med tillatelse fra Bloomberg New Energy Finance/McKinsey & Company

The engineer's problem: How to get there ???

The future of transport



Whats a pilot



Production: what you do every day (minor improvements)

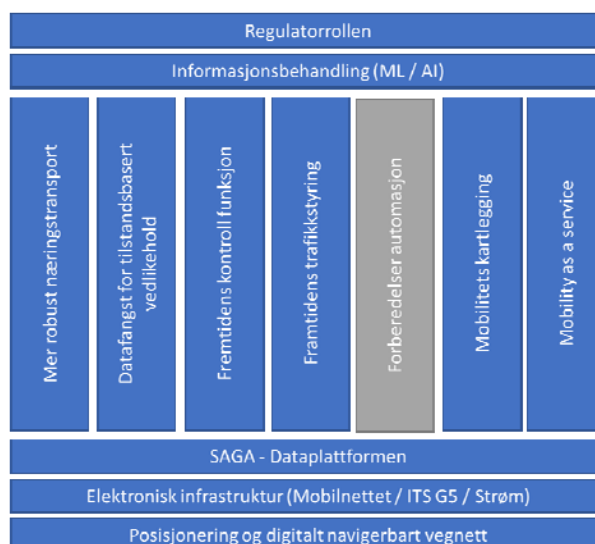
Linear innovation: the least expected improvements (low or no risk), within existing legal framework

Pilots: Testing to discover challenges with technology and legal aspects (*Do it and learn it*) done to reduce risk before LI – failure is an option

Research: Find new solutions, give ideas to the pilots

Important: In the pilots we apply scientific principles to ensure validity of results.

What are we aiming to solve in the ITS Pilots



E6 Oslo-Svinesund at Patterødkrysset

C-ITS holds a lot of potential, but the proposed services bring limited benefits to the Norwegian Public Roads Administration.

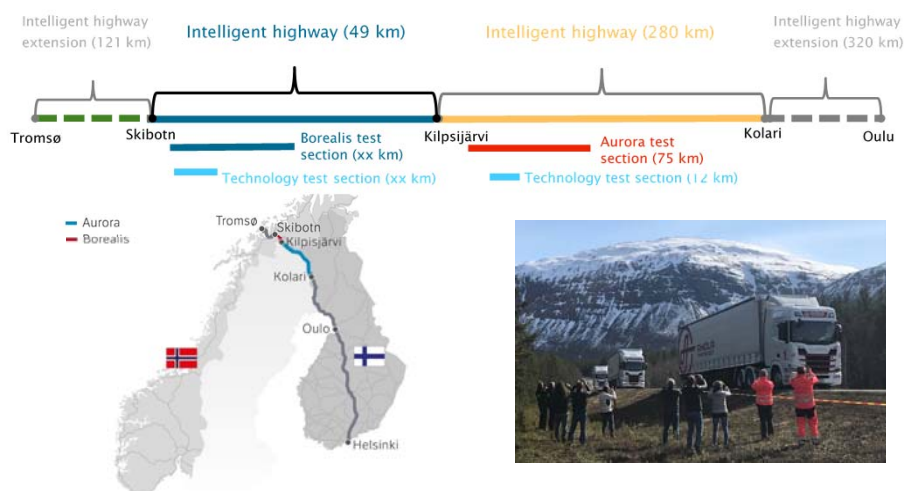
We built a test site to explore more relevant benefits and how we can achieve these.

First use cases:

- Wrong way driver
- Queue on off ramp (100Kph)



Region nord E8 – Borealis prosjektet



E8 Technology



Detection of stopped vehicles:

- Distributed Acoustic Systems (DAS)
- Lidar
- Magnetometers
- ITS stations

Environmental sensing:

- Traditional weather stations
- Cameras (20X)
- Mobile sensors
- Video analytics

Predictions:

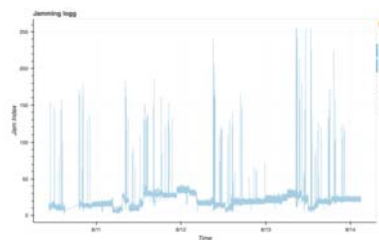
- 36 Hour prediction of traveltime

After the fact:

- Camera information collection and structuring from the field

+++

GPS-jamming, myth or fact ?



Some example data
from our home-made
logger



```
# id; timestamp; jam-indicator
462179; 2017-10-21 20:57:23; 69
462180; 2017-10-21 20:57:24; 44
462181; 2017-10-21 20:57:25; 255
462183; 2017-10-21 20:57:27; 78
```

**Why is the NPRA
looking into this?**

Fra UBLOX M8 spec'en 14.2 Jamming/Interference Indicator

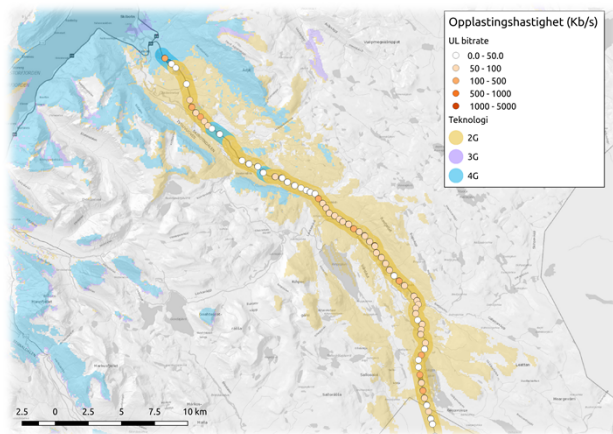
The field `jamming` of the `UBX-M08-10N` message can be used as an indicator for continuous wave (narrowband) jammers/interference only. The interpretation of the value depends on the application. It is necessary to run the receiver in an unjammed environment to determine an appropriate value for the unjammed case. If the value rises significantly above this threshold, this indicates that a continuous wave jammer is present.

This indicator is always enabled.

The indicator is reporting any currently detected narrowband interference over all currently configured signal bands.

<https://github.com/NPRA/jammerMon>

How do we transfer data from the vehicle ?



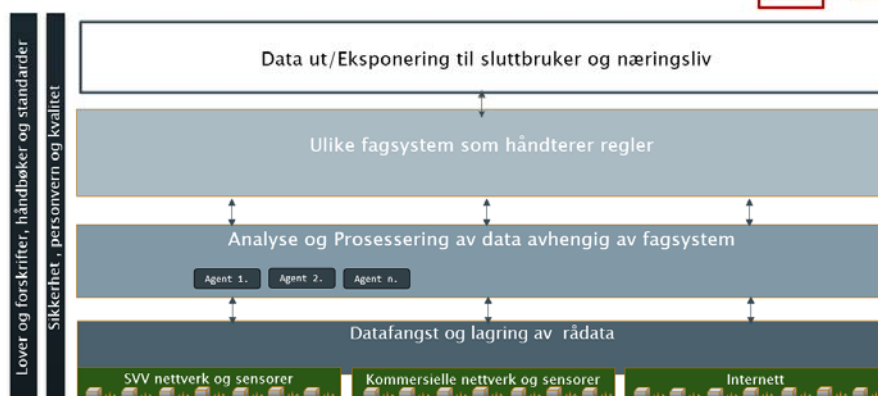
We have done mapping of cellular coverage and theoretical computations of coverage

Is Transportation science becoming datascience ?



Dobbeltrykk for å legge til tekst

Konsept – fleksibel plattform med C-ITS
sanntidsdata av høy kvalitet



Thank you for your attention !



Photo: Elin Leikvang

And on the lighter side:

How to confuse the automated car !



Photo: James Bridle