WELCOME TO NORDICWAY 2 SWEDISH SHOWCASE

Co-financed by the Connecting Europe Facility of the European Union

Magnus Hjälmdahl, Sweco

Sofie Vennersten, Drive Sweden

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Nordic WAY 2

NordicWay 2 is a collaboration between public and private partners in Finland, Norway, Sweden and Denmark

Co-financed by the European Union within the Connecting Europe Facility programme 2017-2020

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Picture: Wikimedia Common, S. Solberg J.

Agenda for the day

NordicWay 2 Swedish Pilot Presentation
10.00 – 11.30 CET

An introduction to the Swedish Pilot in NordicWay 2 and its partners including presentations on:

- The NordicWay 2 project
- Interchange Architecture
- Emergency Vehicles Approaching
- Traffic Signals
- Dynamic Environmental zones
- Access Control
- Road Works Warning

Beyond NordicWay 2
13.00 – 14.30 CET

Panel discussions on topics concerning NordicWay 2 and beyond including discussions on:

- Usefulness from a citizen and user perspective
- Potential and challenges with a platform for data exchange
- The benefits and challenges of cooperation

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NordicWay 2 Swedish Pilot Presentation

Welcome and Opening of Showcase	Magnus Hjälmdahl, Sweco Sofie Vennersten, Drive Sweden
Introduction to NordicWay 2	Arne Lindeberg, Swedish Transport Administration
Architecture / Interchange	Anders Fagerholt, Ericsson
Emergency Vehicles Approaching	Kristian Jaldemark, Carmenta
Traffic Signals	Johan Östling, RISE
Dynamic Environmental Zones	Mikael Ivari, City of Gothenburg
Access Control	Thomas Sjöström, Sweco
Road Works Warning	Alexander Paier, Kapsch

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Beyond NordicWay 2

All panel discussions are led by Magnus Hjälmdahl and Sofie Vennersten and starts with opening statements from the invited panelists

- **Usefulness from a citizen and user perspective**
  Kristina Bäck Jensen, City of Gothenburg
  Stina Carlsson, Volvo Cars Company
- **Potential and challenges with a platform for data exchange**
  Björn Selander, Swedish Transport Administration
  Kjell Persson, Swedish Transport Administration
- **The benefits and challenges of cooperation**
  Per Einar Pedersli, Norwegian Public Roads Administration
  Johnny Svedlund, Swedish Transport Administration
  Eva Boethius, Swedish Transport Administration
  Arne Lindeberg, Swedish Transport Administration

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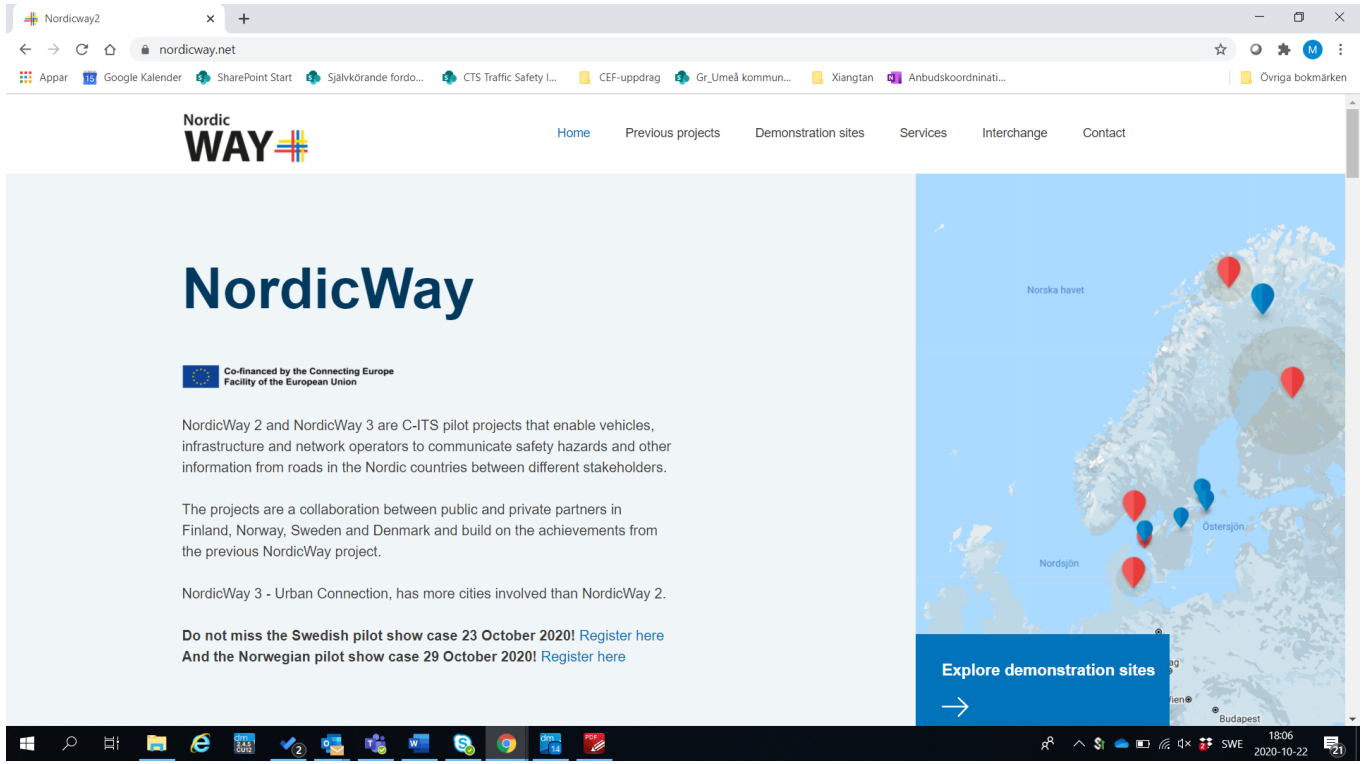
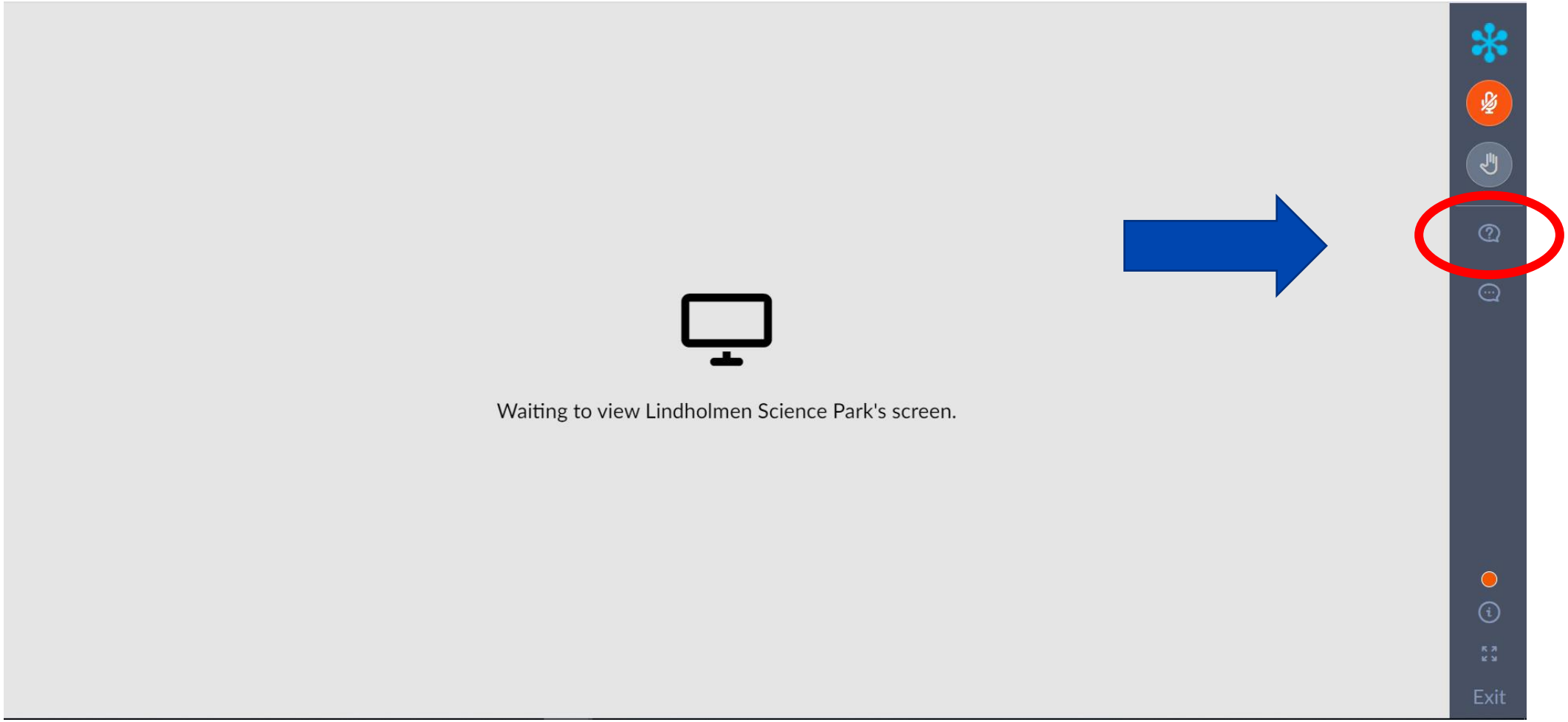
Some practical information

- The event is recorded and will be uploaded to www.nordicway.net/ after the Showcase

- If you have colleagues that have difficulties joining – direct them to www.nordicway.net/ and there is a link on the front page



Interacting with the speakers



SESSION 1a
INTRODUCTION TO NORDICWAY 2

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Arne Lindeberg
Swedish Transport Administration

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NordicWay 2

The Swedish pilot – Introduction

Arne Lindeberg, Swedish Transport Administration

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Picture: Wikimedia Common, S. Solberg J.

Strategic approach

- The connected vehicle - A functionality in the transport system
- Can facilitate a wide range of services
- Thus a substantial potential to improve transport system performance in terms of efficiency, environmental aspects and traffic safety.

NordicWay approach

- Take advantage of cellular networks (long range communication)
  - Avoid road side installations
  - Better area (road network) coverage
- OEM channel to the car
- Information exchange back-end (interchange node)
- Short range communications as case specific solutions if necessary
- Cross-border cooperation and European cooperation

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Scalable throughout Europe and beyond

Overview of the C-ITS services piloted in Sweden within NordicWay 2

- EVA, **E**mergency **V**ehicle **A**pproaching
- RWW, **R**oad **W**orks **W**arning
- Dynamic access control of designated infrastructure
- Dynamic environmental zones
- TTG, **T**ime **T**o **G**reen
- GLOSA, **G**reen **L**ight **O**ptimal **S**peed **A**dvisory
- TSP, **T**raffic **S**ignal **P**riority for designated vehicles (“BussPrio” in Uppsala)

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Cooperating Transport and Road Administrations

Nordic WAY 2

Statens vegvesen
Norwegian Public Roads Administration

TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

Vejdirektoratet
Danish Road Directorate

Trafi
Finnish Transport Safety Agency

Liikennevirasto
Finnish Transport Agency

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Swedish Implementing Bodies

Nordic WAY 2

VOLVO
VOLVO GROUP

VOLVO

kapsch

swarco

ERICSSON

SCANIA

carmenta
superior situational awareness

Uppsala KOMMUN

ZENUITY

Technolution

Stockholms stad

City of Gothenburg

vti

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Expanding cooperation

- **NordicWay 4**
- **NordicWay 2 13**
- **NordicWay 3 ~ 35**

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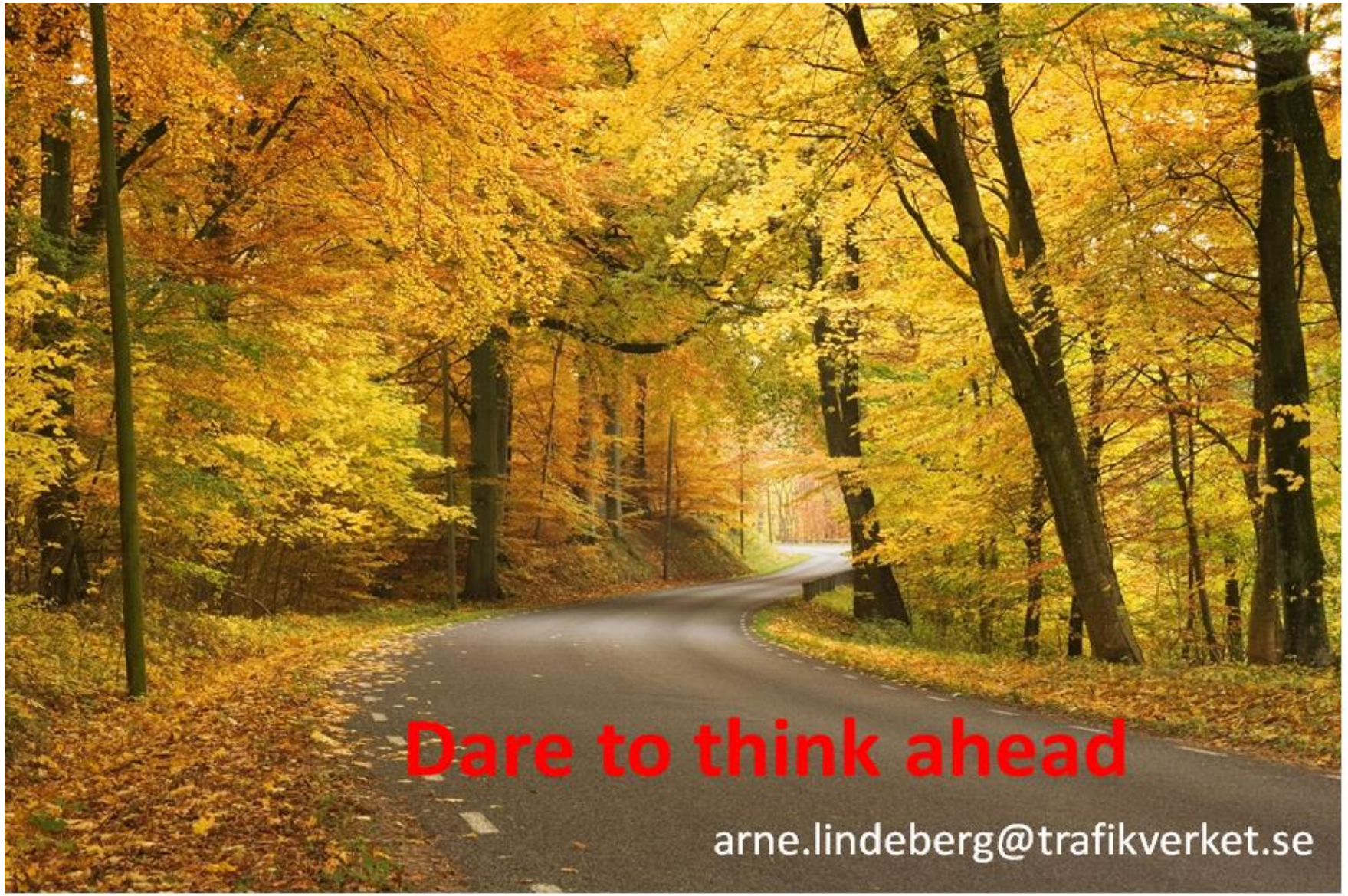

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Anders Fagerholt
Ericsson

Nordic WAY 2

Architecture / Interchange

NW2 Swedish showcase

Anders Fagerholt, Ericsson

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Foundation for Nordic Way ITS

- Cellular communication (LTE) in most use cases
- Service providers
  - Automotive OEM´s
  - Cities
  - Swedish Transport Administration
  - Other service providers
- Backend (cloud) message exchange among all, end users anonymous (Service providers secret)
- Publish – subscribe in “real time” (50 ms – 100 ms – 500 ms)

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Enablers

- Internet
- Service providers cloud connected vehicles and items (street furniure)
- AMQP – Advanced Messag Queing Protocol
  - Pay load agnostic message exchange
- DATEX II messages
- ETSI messages
  - DEMN, CAM (”warnings”)
  - SPaT, MAP (”intersections and traffic lights)
  - SSR, SSM (”signal priority messages”)
- C-Roads TF 4 for European harmonization

https://en.wikipedia.org/wiki/Advanced_Message_Queuing_Protocol

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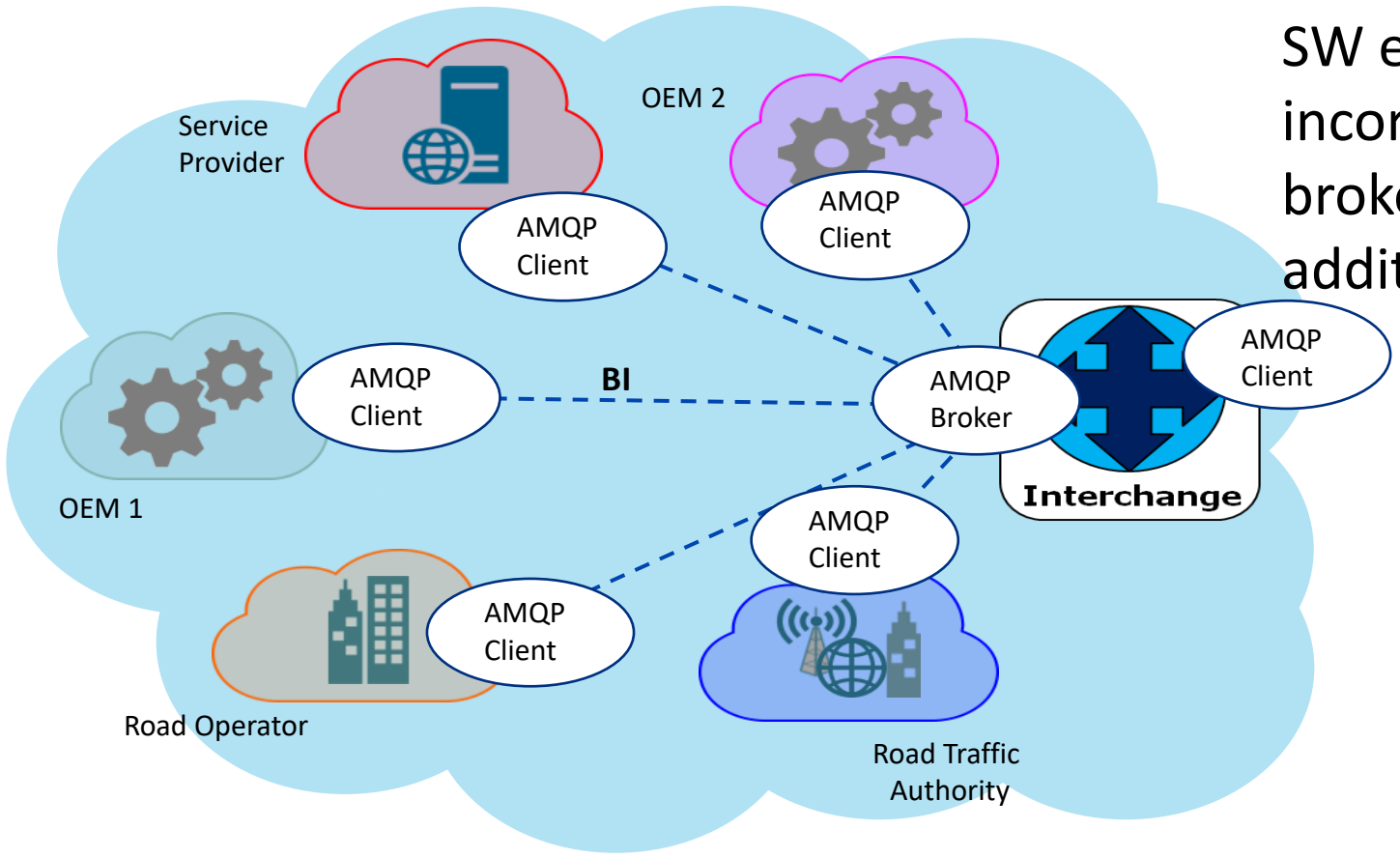
Architecture (singel country)



Interchange – Specialized SW entity that incorporates an AMQP broker/client plus additional functionality

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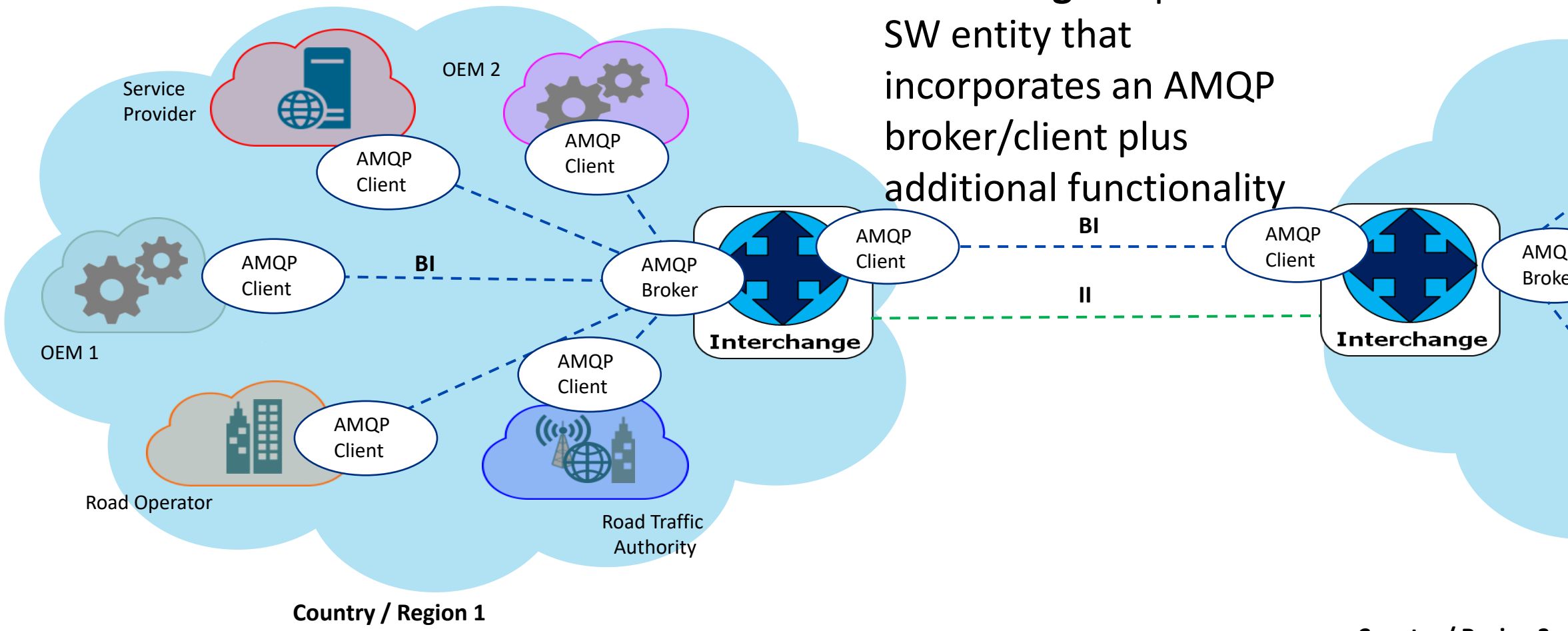
BI, basic interface, ITS data

Architecture (multi country)

Nordic WAY 2

Interchange – Specialized SW entity that incorporates an AMQP broker/client plus additional functionality



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II = Improved interface, control data, federation, service discovery

QUESTIONS FROM THE AUDIENCE

Nordic WAY 2

SESSION 1b
PILOT PRESENTATIONS

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Kristian Jaldemark
Carmenta

NordicWay 2
Emergency Vehicle Approaching

Kristian Jaldemark, Carmenta

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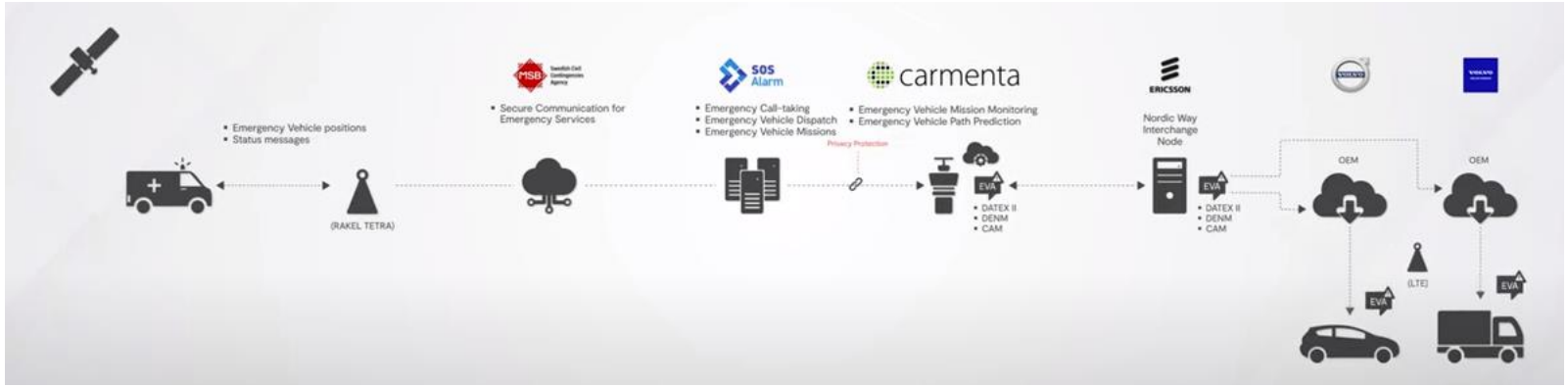
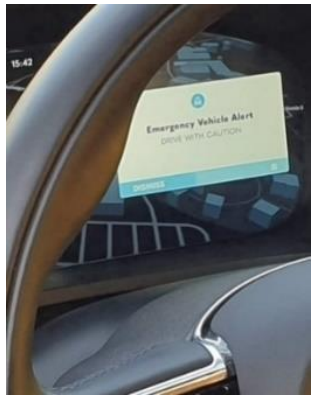
Task 2-Emergency Vehicle Approaching

- **Mission** - alert vehicles about emergency vehicles before the driver can perceive the emergency vehicle through siren sound or visually
- **Method** – connect to emergency response system for emergency vehicle information and create standardized C-ITS EVA warning messages for vehicle OEMs
- **Technical Validation** – Gothenburg as demo and test arena
- **Societal Impact Validation** - Simulator studies performed by VTI



Results – Emergency Vehicle Approaching

- The complete ecosystem needed to provide a national EVA C-ITS service in Sweden is tested and demonstrated
- From a technical point of view, the solution is validated
- Standardized solution, using ETSI and DATEXII standards
  - Approved DATEXII extension *Emergency Vehicle Assignment Information*
- Simulator Study on Effects of EVA warnings



https://datex2.eu/implementations/extension_directory/emergency-vehicle-assignment-information-extension

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VTI Simulator Study on EVA warnings

- **Publication** - In-Car Warnings of Emergency Vehicles Approaching: Effects on Car Drivers' Propensity to Give Way *(Lidestam, Thorslund, Selander, Näsman, 2020)*
- **Method** - Ambulance passed participant three times
  - without EVAM
  - EVAM in instrument cluster
  - EVAM in instrument cluster and in center console

https://www.vti.se/sv/publikationer/publikation/in-car-warnings-of-emergency-vehicles-approaching_1466493

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VTI Simulator Study - Conclusions

- **Findings** - EVA warnings
  - made drivers give way earlier
  - learned to give way earlier even without an EVA message
  - was necessary for making inexperienced drivers give way to an approaching emergency vehicle on call
- **Conclusion** – to alert and instruct drivers how to give way properly is beneficial for traffic safety and for enabling time-efficient emergency transports

Areas for Future Work

- Standardization and harmonization across EU
- Data sources and privacy issues for emergency vehicle information
- Behavior of warned drivers
- Automated Driving requirements
- Business Models



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QUESTIONS FROM THE AUDIENCE

Johan Östling
RISE

Nordic WAY 2

NordicWay 2 Traffic Signals

Johan Östling, RISE

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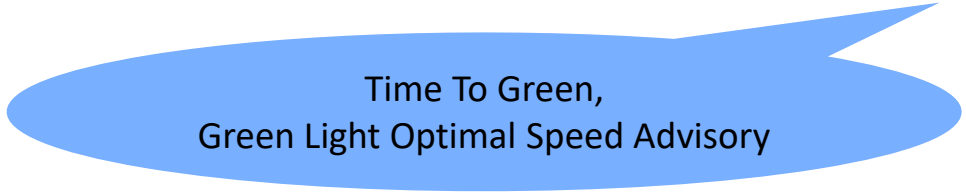
Traffic signals

Our NW2 Pilots have proven that the traffic signal concept works in a very first technical set-up. The NW2 infrastructure enables digital communication of status and geographical data in a standardised way and with acceptable latency. We have tested with good results TTG, GLOSA and TSP (bus-prio) services!



What remains?

- How does the C-ITS add value for the cities and the road authorities (local and national level)?
- How should and could a business model for the *traffic signals concept* be arranged? New roles, what mandate, how to share the costs etc.?
- How to exchange more relevant data between the C-ITS world and the Public Transport world?
- All other services related to the *traffic signals,* e.g. Motorway Control Systems (MCS), Time to Red (TTR), Red Light Violation Warning (RLVW), should be included.
- How to predict phase shifts for vehicle actuated traffic signals especially when certain priorities occur.
- From a detailed technical and collaborative perspective, there are areas to improve e.g. TTG predictions, optimize technical solutions and robustness from the “intersection to the vehicle”.

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QUESTIONS FROM THE AUDIENCE

Thomas Sjöström
Sweco

NordicWay 2

Dynamic access control of designated infrastructure

Thomas Sjöström, Sweco

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Dynamic access control of designated infrastructure

Objective

- Demonstrate service that enable better use of existing infrastructure with active steering and control of traffic in urban areas.
- Explore how to use available capacity

Pilot functionality

- Test truck on E4, Stockholm, requested access by CN to use bus lane. Traffic operator granted or denied access depending on traffic conditions and vehicle characteristics.

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Future potential

- Technically the vehicles and infrastructure are ready for the service
- Define criteria to be fulfilled for a vehicle to use the buss lane or a dedicated lane
  - Based on rules and policies from the city/road authority
  - Criteria such as vehicle characteristics, traffic environment, vehicles important for society
- A powerful transport planning tool
  - The full potential is a complete redesign of traffic management
  - Enable flexible roads, with different use during different time
  - A new service using same functionality is to access lanes for electrical charging roads
- Advanced dynamic geofencing enable access to lanes
  - A traffic center can open-up or close lanes for a group of vehicles depending on the current traffic situation without any explicit request from a specific vehicle.

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QUESTIONS FROM THE AUDIENCE

Michael Ivari
City of Gothenburg

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Dynamic Environmental Zones

NW2 Swedish showcase
Mikael Ivari, city of Gothenburg

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Movie

Nordic WAY 2

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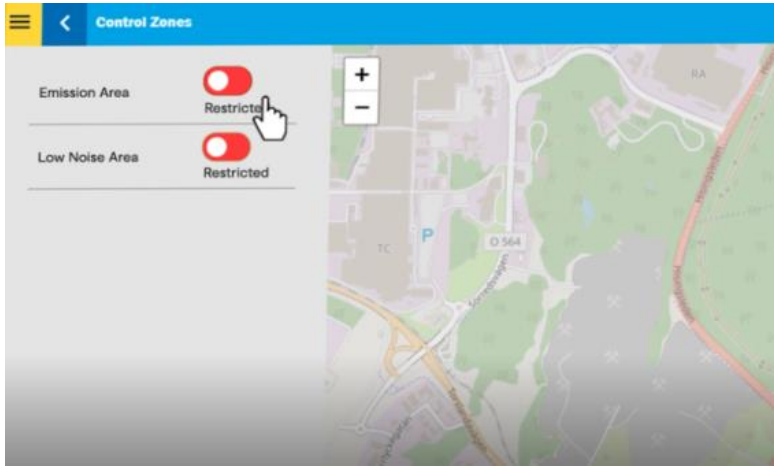
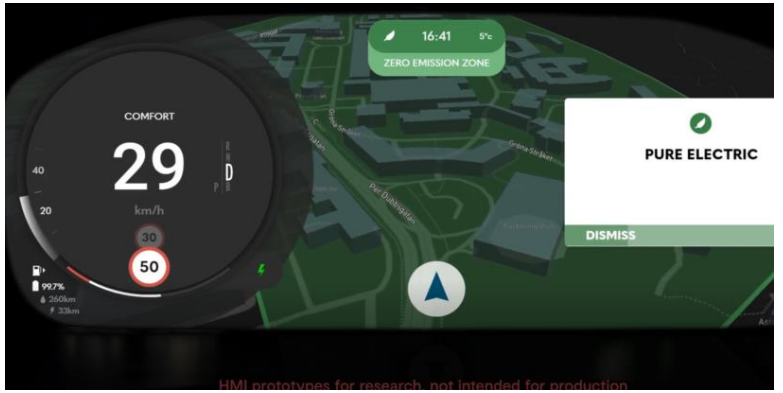
Facility

Technical evaluation of service

- The dynamic environmental zone service is not time critical in its essence.

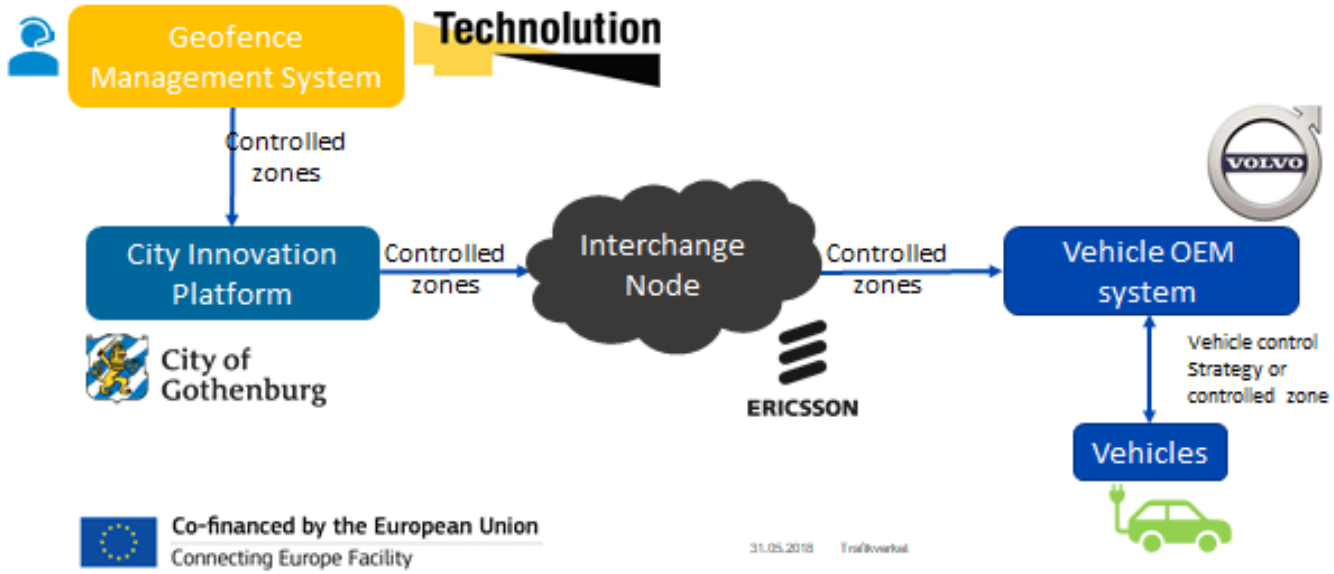
- Round-trip latency of 10 seconds between the GUI change and the actual response in the car which is more than acceptable. This latency compasses all individual steps in all systems.





Service ecosystem

- Eco system setup is policy dependant. Roles and responsibilities will vary with setup of the service.
- The legal framework for Environmental zones in Sweden does not include PHEV.
- Other incentive-based approaches are fully possible, with or without the participation of road authorities.



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Lessons learned

- Cloud solutions works fine but robustness must be secured.
- Common integration tests improved project results.
- Data flow includes only the status of the zones and no privacy related information.
- Vehicle reporting back mechanisms were excluded from the pilot since there were no incentives implemented in the service.

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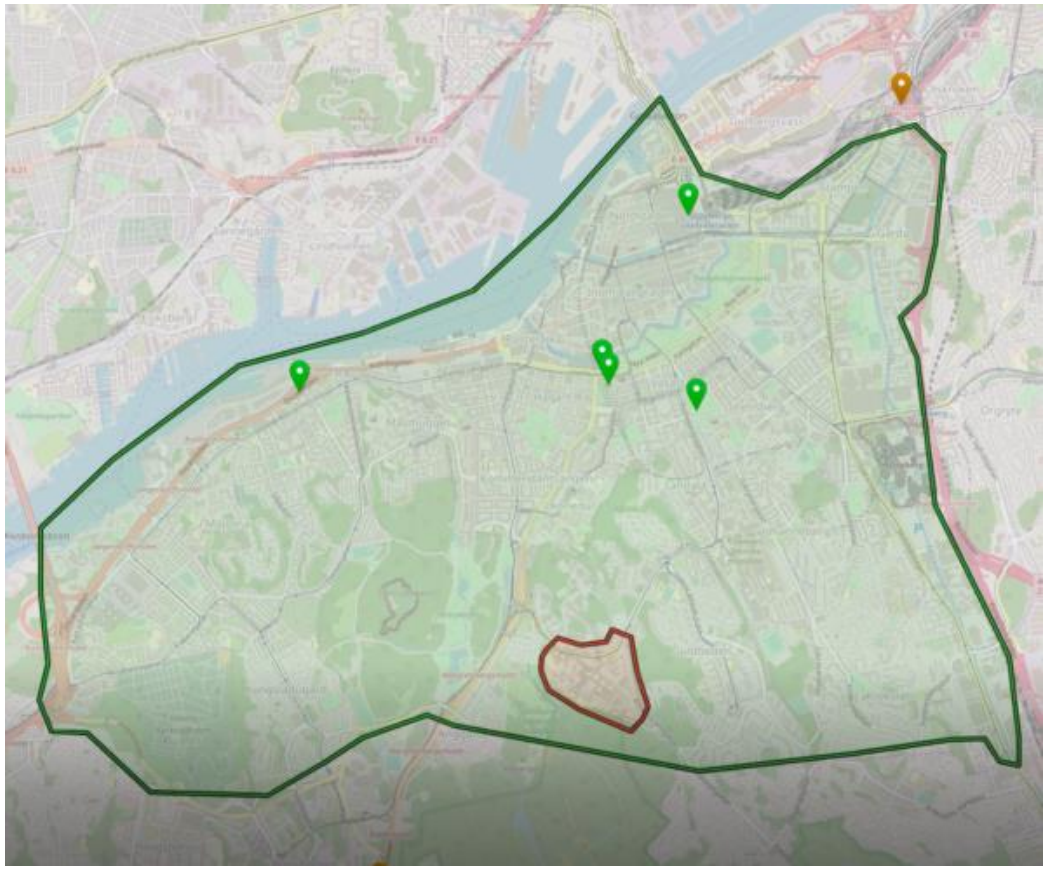
Conclusions / Future challenges

- The possibilities with geofencing as a method for the road authority to provide **digital dynamic traffic regulations** is interesting and worth more investigation.
- **Different implementation policies** have been identified for dealing with low emission zones.
- Further research and development will be required to combine the existing static geofences with dynamic elements.



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QUESTIONS FROM THE AUDIENCE

Alexander Paier
Kapsch

NordicWay 2
RWW - Reflections to the Pilot

Alexander Paier, Kapsch

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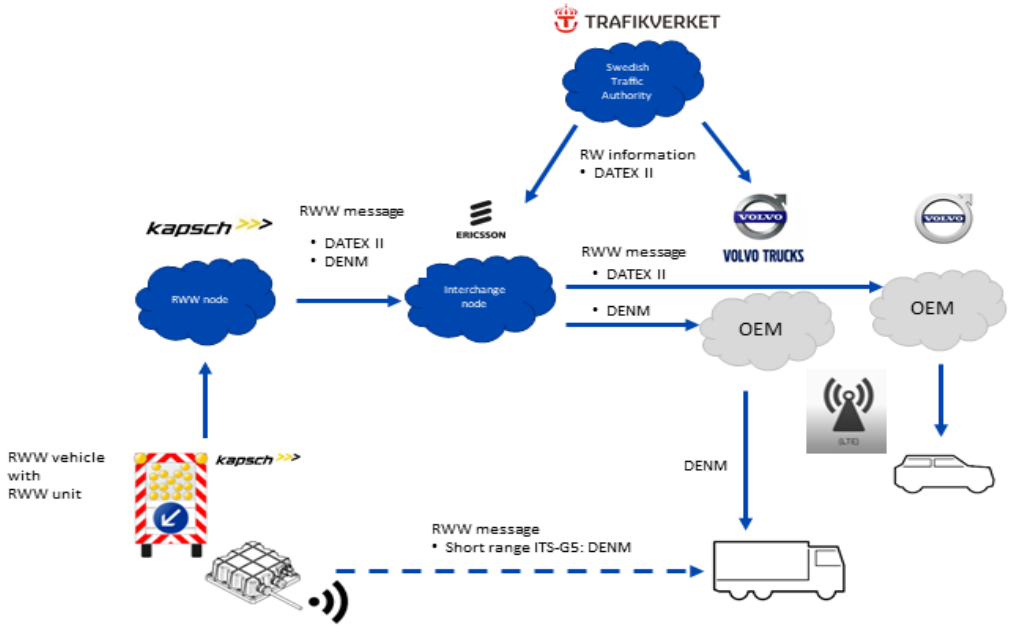
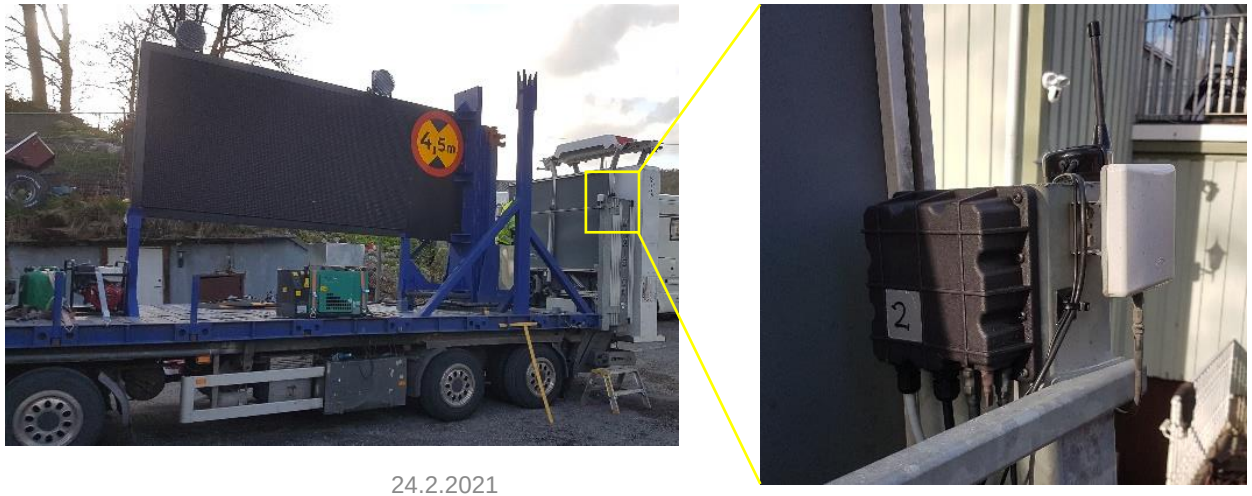
A9T9 RWW - The Project

- Content of the RWW message
  - RW warning, RW position, trace, traffic flow rule (pass to right/left)
- Planned RW data from STA to Interchange Node and OEM cloud
- No manual interaction required for triggering RWW
- True Hybrid solution
  - Short-range communication via ITS-G5
    - data format: DENM
  - Long-range communication via cellular
    - data format: DENM + DATEX II



A9T9 RWW - The Project

- Each single C-ITS equipped vehicle benefits from the warning → saving lives
- Constructive and very good cooperation between OEMs, system vendors, and authority
- Important tasks
  - Coordination between RWW generator and RWW consumer regarding services, data formats, message management, …
  - Coordination with TMA vehicle subcontractors for RWW unit installation → regulation



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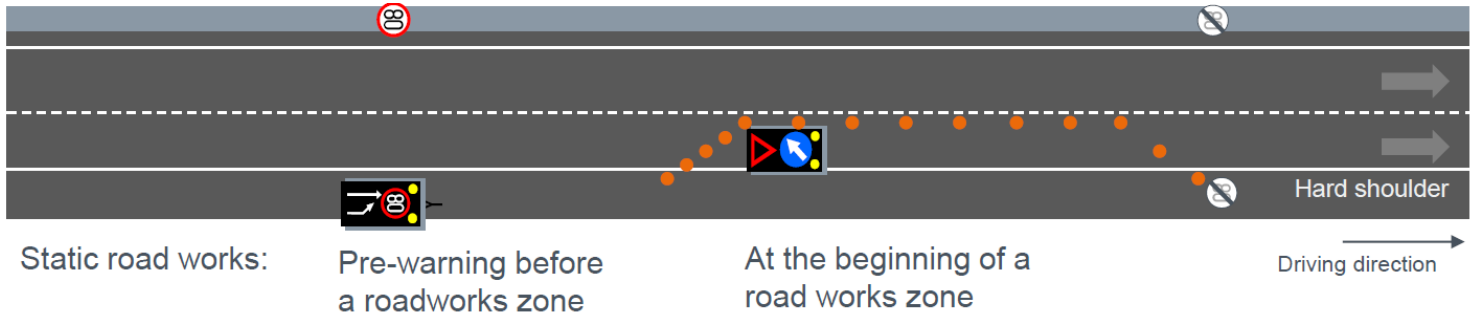
A9T9 RWW – What's Next

Possible work for NW3

- Produce specifications for procurement of road service vehicles, TMA vehicles,… with C-ITS equipment (common on national and city level)
- How can national road operators (STA) and cities work together
- Combination with use cases HLN and Geofence
- Learning from project - state of the art today: control the digital signs via cloud-based solution. → Cloud could also produce C-ITS messages as "bonus"
- User experience how to interpret information
- Enrichment of RWW data with planned RW data (speed limit, closed lanes, extension of RW)



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QUESTIONS FROM THE AUDIENCE

After lunch: Beyond NordicWay 2

All panel discussions are led by Magnus Hjälmdahl and Sofie Vennersten and starts with opening statements from the invited panelists

- **Usefulness from a citizen and user perspective**
  Kristina Bäck Jensen, City of Gothenburg
  Stina Carlsson, Volvo Cars Company
- **Potential and challenges with a platform for data exchange**
  Björn Selander, Swedish Transport Administration
  Kjell Persson, Swedish Transport Administration
- **The benefits and challenges of cooperation**
  Per Einar Pedersli, Norwegian Public Roads Administration
  Johnny Svedlund, Swedish Transport Administration
  Eva Boethius, Swedish Transport Administration
  Arne Lindeberg, Swedish Transport Administration

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LUNCH BREAK UNTIL 13.00

WELCOME TO NORDICWAY 2 SWEDISH SHOWCASE

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SESSION 2
BEYOND NORDICWAY 2

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Beyond NordicWay 2

All panel discussions are led by Magnus Hjälmdahl and Sofie Vennersten and starts with opening statements from the invited panelists

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Nordic WAY 2

Kristina Bäck Jensen
City of Gothenburg

Stina Carlsson
Volvo Car Cooporation

Usefulness from a public perspective

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NordicWay 2

NW2 Swedish showcase
Kristina Bäck Jensen, Urban Transport Administration, city of Gothenburg

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Goals – Why do we participate?

- ❑ Traffic Signal & Infrastructure Owner
- ❑ Gothenburg as Test Site
- ❑ Influence digitalization of the city
- ❑ Sustainable & Liveable City

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NW2 Findings 1(2)

1. Collaboration necessary to achieve Perspective Awarness

- The road authorities, the cities, the vehicle industry, the service providers and the academy need to work together with socio-technical developments to suceed!

- **Perspective Awarness is important**

  - ***Stakeholders may have different objectives and possibilities but quite often we also see synergies eg***:
    - Decreased Fuel Consumption – Decreased Emissions, Healthier environment
    - Decreased No of starts and stops – Decreased Emissions, Smooth Traffic Flow, Less Congestion
  - ***Different products – Same purpose***
    - Airbags for saving lives – Energy Absorbing Barriers for saving lives (Collaboration→enables optimization?)

  - ***Different Technical solutions for different cities/areas***
    - Eg GLOSA*, a great function in cities or areas with fixed time traffic signals but not as useful in actuated systems where the traffic signals are programmed to prioritize public transports.

This proves how important it is to work together, that we have a dialogue and bring in different perspectives when developing socio-technical functions

NW2 Findings 2(2)

2. **Enhanced Road Operator Services requires vehicle probe data***
   With access to vehicle probe data we could optimize our traffic signals, improve passability and minimize travel time.

3. **Beneficial financial terms and conditions to local authorities enables cities to participate**
   Important to allow generous conditions in terms of financial compensation and keep a sustainable perspective** for the developed services or products.

4. **Large scale demonstrations needed to evaluate benefits - to prepare for future upscale**

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Future Challenges

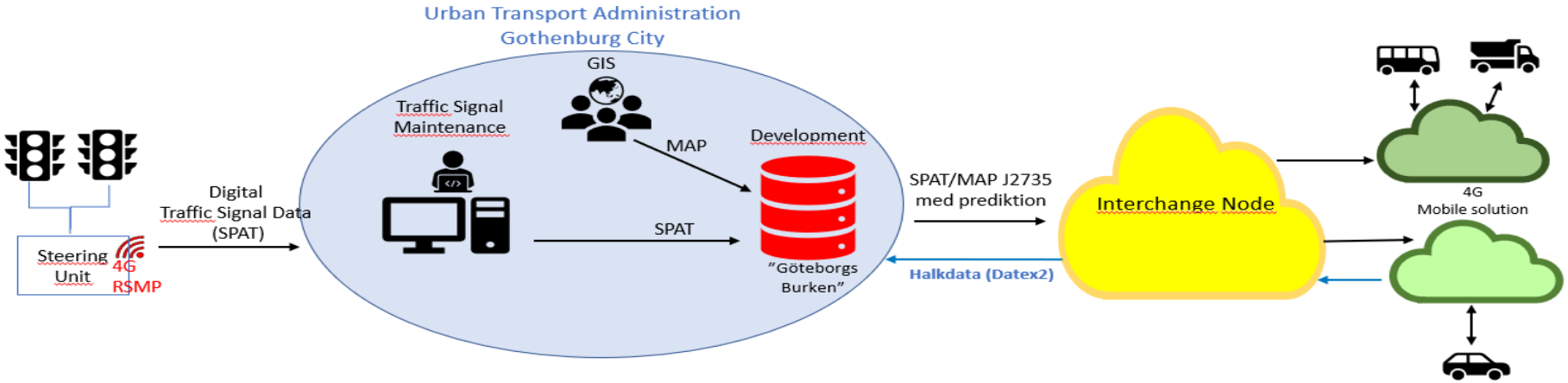
*How do we create a **transparent** and **safe** environment where both authorities and OEMs data can be shared?*

Business Model

- Responsibility – who is responsible for what?
  - Data Development & Maintenance
  - Quality Assurance & Storage
- Who should have access to the data?
- How is the solution financed?

Technical Solution

- Can technical requirements be defined before Business Model is decided?
- Requirements (latency, predictions etc)
- Standardized APIs
- Security and Integrity*



Nordic WAY 2

Kristina Bäck Jensen
City of Gothenburg

Stina Carlsson
Volvo Car Cooporation

Usefulness from a public perspective

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NordicWay 2

NW2 Swedish showcase

Stina Carlsson, Volvo Car Corporation

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NordicWay 2

Volvo Cars goal in the project is to increase traffic safety and reduce environmental impact with the use of cellular network ITS systems.

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Usefulness of the services

- Emergency Vehicle Alert (study by VTI)
  - Made driver give way earlier and supported inexperienced drivers
  - Beneficial for traffic safety and for enabling time-efficient emergency transports
- Road Work Warning
  - Support the driver, reduce risk of accidents
- Environmental geofence for hybrid vehicles
  - Support zero emission zones for individuals or cities
- Predictive engine control
  - Reduce fuel consumption and emissions and support a smoother traffic flow
- Time To Green
  - Support the driver, contribute to a smoother traffic flow

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NordicWay 2, findings

- Dialogue and collaboration between the different actors in a triple helix manner.
- Focus to pilot a few defined use cases.
- Different infrastructure solutions in different cities.
- Collaborative effort to create the services.

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Looking forward

Get the services to production:

- Acknowledge the work that the road owner may need to perform.
- Update procurement specifications to support C-ITS equipped contractor vehicles.
- Understand data sources and privacy issues for emergency vehicle information.
- Keep the focus on a standardized data exchange pattern for real-time data exchange cloud to cloud.

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Björn Selander
Swedish Transport Administration

Kjell Persson
Swedish Transport Administration

Platform for data exchange

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NordicWay 2
Data exchange in the collaborative ITS ecosystem

Björn Selander and Kjell Persson, Swedish Transport Administration

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The differences between C-ITS and TTIS

C-ITS is aiming at driving assistance and autonomous driving rather than traffic-information.

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The differences between C-ITS and TTIS

C-ITS is aiming at driving assistance and autonomous driving rather than traffic-information.

Elaborated requirements on data exchange

- **Trust**
  Establish trust and relationships between partners in the ecosystem

- **Information security**
  Establish a secure channel for information between roadside and vehicle

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The differences between C-ITS and TTIS

C-ITS is aiming at driving assistance and autonomous driving rather than traffic-information.

Elaborated requirements on data exchange

- **Trust**
  Establish trust and relationships between partners in the ecosystem

- **Information security**
  Establish a secure channel for information between roadside and vehicle

Key activities

- IT security
- Regulations

From piloted services to production

Technology has matured in NW1 and NW2.

From piloted services to production

Technology has matured in NW1 and NW2.

Elaborated requirements on data exchange

- **Join four different ecosystems**
  Establish the ability to communicate (with trust) between different stakeholders

- **Actors position in different ecosystem is challenged**
  Establish Producer, Consumer and Broker

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From piloted services to production

Technology has matured in NW1 and NW2.

Elaborated requirements on data exchange

- **Join four different ecosystems**
  Establish the ability to communicate (with trust) between different stakeholders
- **Actors position in different ecosystem is challenged**
  Establish Producer, Consumer and Broker

Key activities

- Business models and revenue streams
- Actor responsibilities and regulations

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Swedish transport administration agenda

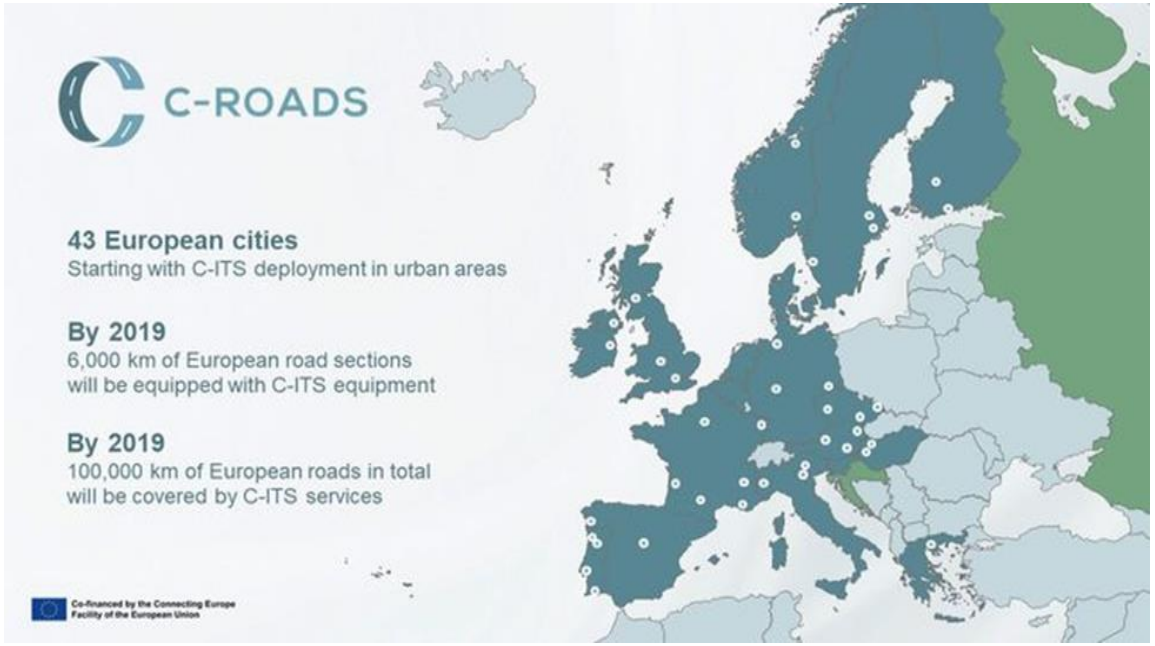
Two collaboration platforms to negotiate technology standards with regards to future regulations in C-ITS standards.

- **C-roads – Harmonisation of C-ITS services at EU-level**
  - Present a Nordic technical solution based on IP-connectivity and LTE-network for Day 1 and Day1.5 services with knowledge gained in NW.

- **NW – Harmonisation of C-ITS services at Nordic level**
  - Pilot and test solutions in cooperation with the Nordic countries
  - Build knowledge and a nordic cooperation strategy for C-ITS regulations in C-roads
  - Collaborate with actors in all ecosystems to get closer to a real world implementation

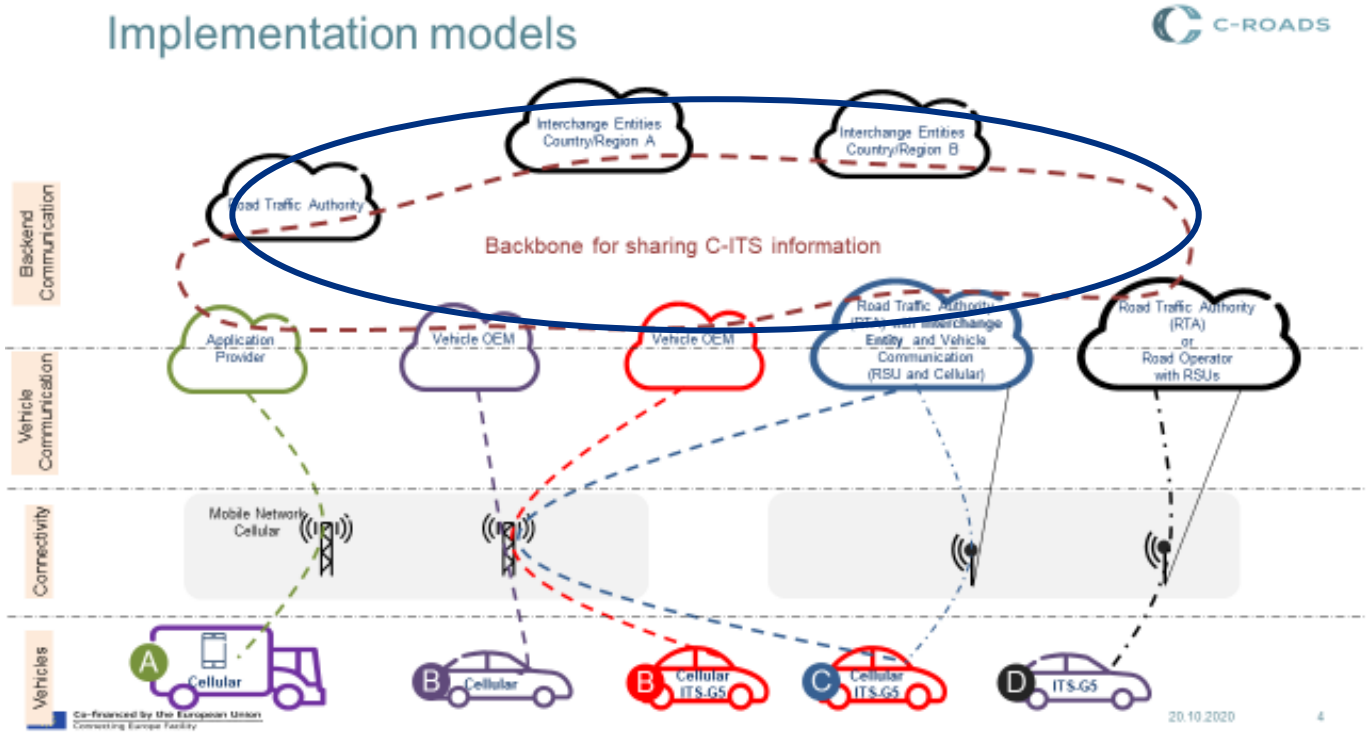
C-Roads – Cooperation between European Member States

- Focus on implementing C-ITS services
- Harmonised specifications for
  - Cross-border information exchange
  - Interoperability
  - Specifications for both short-range (ITS-G5) and long-range (cellular) communication



Long-range harmonisation

- Several different implementation models in European pilots
- Harmonisation possible on standards for back-end communication
- C-ITS IP Based Interface Profile – harmonised interface for cross-border information exchange



Nordic WAY 2

Per Einar Pedersli
Norwegian Public Roads Administration

Johnny Svedlund
Swedish Transport Administration

Eva Boethius
Swedish Transport Administration

Arne Lindeberg
Swedish Transport Administration

Cooperation

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NordicWay 2
Cooperation - NPRA perspective
Per Einar Pedersli

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NPRA strategic goals

The Norwegian Public Roads Administration's international activities have three goals:

- It will provide us with **new knowledge** that will strengthen the professional development in the organization.
- It will provide better **coordination** of cross-border plans, projects and transports **in the Nordic region.**
- It shall **contribute to regulatory development** within the road and road traffic area in Norway by influencing and fulfilling obligations to implement EU regulations within the framework of the EEA agreement.

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NordicWay2 fullfilling the strategic goals of NPRA

Goal: knowledge:

- cooperation between countries to handle such a big ITS-projects efficiently and to ensure knowledge exchange
- Sharing of knowledge and best practices – competence building, this pays off
- NordicWay project goals match our need for new knowledge

Goal: coordination within the Nordic countries

- Nordic Way builds upon a solid and well-established network, 25 year long-term cooperation
- Supporting each other whenever needed, possibility to share workload
- Coordination and harmonisation of common services – common understanding
- All decisions based on consensus in PMB.

Goal: regulations

- Getting a stronger voice, common Nordic voice.
- Significant impact on EC development (Interchange Federation and services under winter conditions)

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NordicWay 2

NW2 Swedish showcase
Johnny Svedlund, Swedish Transport Administration

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NordicWay 3 in numbers

- 1 Coordinator – Swedish Transport Administration
- 5 Beneficiaries:
- Infrastrukturdepartementet (Swedish Ministry of Infrastructure)
- Statens vegvesen (The Norwegian Public Roads Administration)
- Liikenne- ja viestintäministeriö (Finnish Ministry of Transport and Communications)
- Vejdirektoratet (Danish Road Directorate)
- Trafikverket (Swedish Transport Administration)

- 35 Implementing Bodies under the Swedish Ministry of Infrastructure
- 5 under Finnish Ministry of Transport and Communications

- 5 years (2019-2023)
- 19 030 k€, where 50% is funded by EU

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NordicWay 3, More of everything…

- More cities
- More users
- More vehicles
- More coordination between countries and pilots
- Continue on what is achieved

- Aim to create a common Nordic market by launching ”flagship pilots” for:

✓Geofencing
✓Traffic signals
✓Roadworks warning
✓Emergency Vehicle approaching

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NordicWay 2

NW2 Swedish showcase

Eva Boethius, Swedish Transport Administration

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International Collaboration

- International cooperation is key!
- NordicWay has proven to be a solid and well-established network (2015-2023)
- Collaboration between public and private partners in Finland, Norway, Sweden and Denmark paves the way for common understanding and competence sharing
- The project followed the policy guidance of the European Commission, and was supported via the Connecting Europe Facility (CEF) programme, managed by INEA.
- Still questions to be answered – roles, responsibilities, agreements in a changing environment
- Ready for further cooperation on new challenges and potential new CEF calls or other relevant European initiatives.

Thank you for the joint effort!

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Stay tuned!

For more information, contacts, upcoming events and deliverables, visit:

https://www.nordicway.net/

Nordic WAY 2

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Statens vegvesen
Norwegian Public Roads Administration

Welcome to NordicWay 2 Norwegian pilot showcase!

NordicWay 2 is approaching the final stage of its project period and the main results from the Norwegian part of the project will be presented at a digital showcase.

NordicWay 2 is a collaboration project between Denmark, Finland, Sweden and Norway with representatives from both public and private sector. The overall objective of the project is to contribute to the harmonization of cooperative intelligent transport system (C-ITS) services by using mainly cellular networks for connections between vehicles and a cloud-based information exchange between actors. Furthermore, the project aims to contribute to the development of digital infrastructure that prepare our transport system for connected and autonomous driving. The project is partly funded by the EU via the Connecting Europe Facility programme (CEF). The project started 2017 and will be finalized in December 2020.

In Norway several C-ITS services have been tested and evaluated – all connected to a common interchange node. The services/use cases selected are believed to contribute to a more efficient transport system with less emissions and increased traffic safety:

- Weather and Road Condition
- Slow and Stationary vehicle
- Signal violation/GLOSA
- Traffic ahead warning
- Mobile road works
- Road and lane closure
- Cooperative collision warning (wrong way driving)
- In-vehicle speed limits

For each service there will be a presentation of the instrumentation/technology used in the pilots.

Contact person: Per Einar Pedersli, email: per.pedersli@vegvesen.no

Online	October 29, 2020	Host
(Microsoft Teams)	09:00 - 14:00 CET (break 11:00-12:00)	Norwegian Public Road Administration

Registration

Registration open until October 26th 23:59 CET

Nordic WAY 2

DRIVE SWEDEN

TRAFIKVERKET

THANK YOU!

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