Hva kan vi oppnå ved å ha standardisering i forskningsprosjekter?

MODI
A LEAP TOWARDS
SAE L4 AUTOMATED
DRIVING FEATURES

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Kartverket

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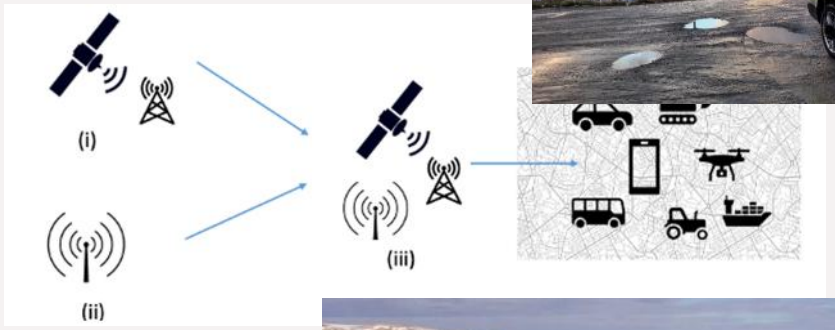
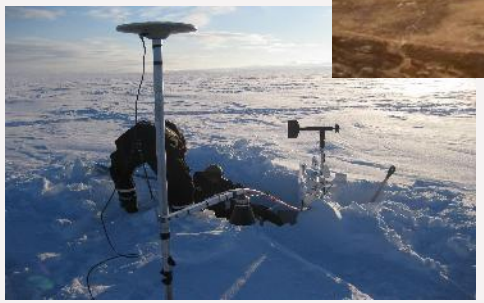
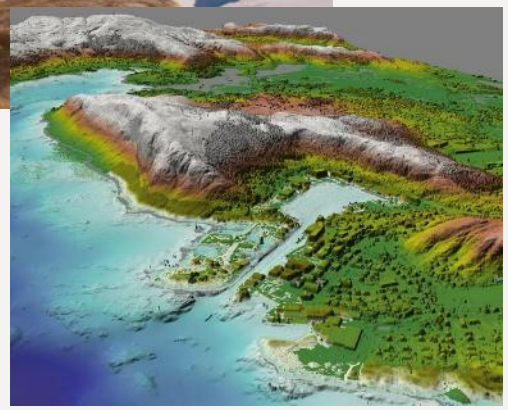
FoU i Kartverket

MODI







Mål

Bidra til at Norge er ledende i bruk av geografisk informasjon ved hjelp av forskning

Fokus på **teknologiutvikling** som bidrar til at det blir enklere å samle, forvalte og dele geografisk informasjon.

Samfunnsbehovene vi retter oss mot er

- samfunnssikkerhet og beredskap
- klima- miljø og naturforvaltning
- kommunal forvaltning og distriktsutvikling
- trygg og effektiv samferdsel
- innovasjon og næringsutvikling

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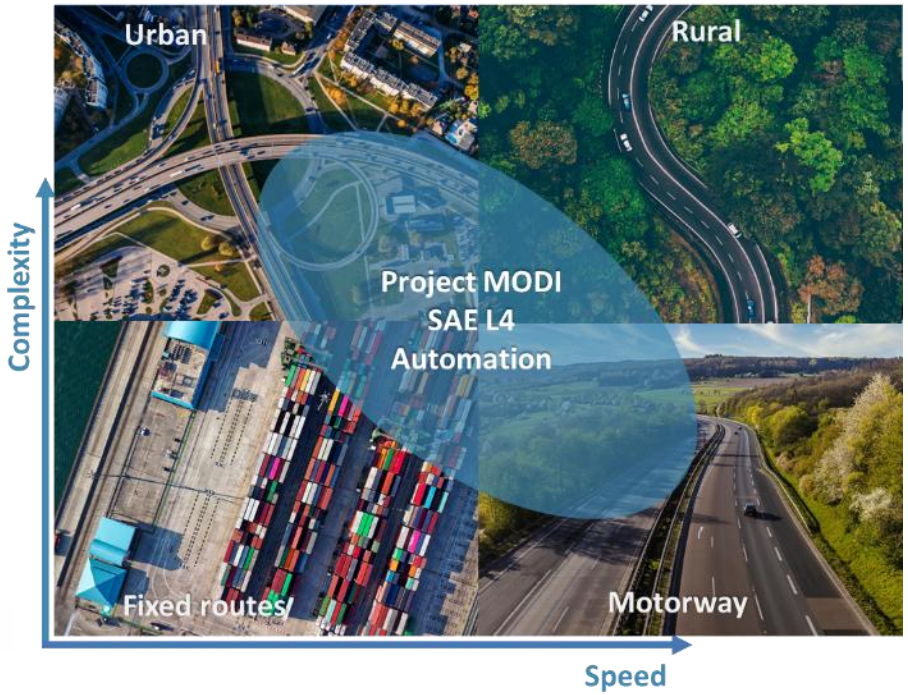
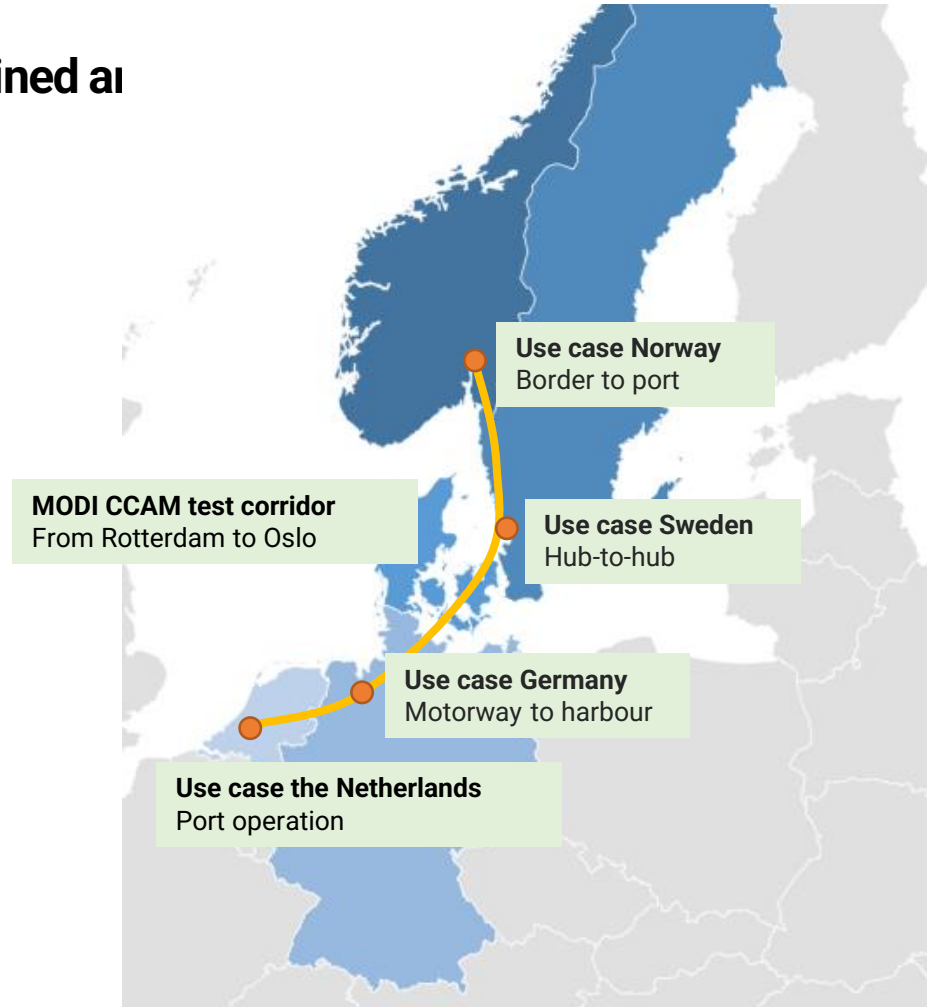
Overview

- **Logistic** corridor from Rotterdam to Oslo
- Identify and largely resolve barriers on this corridor, in **confined ar** and on **public roads**

Leveraging with other projects

ENSEMBLE
MOVE 21
AWARD
C-ROADS
ULTIMO
Orchestra
AUTOPILOT
levitate
AVENUE
connected automated driving.eu
SUNRISE





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Consortium

34 organisations from 8 countries: 27 Participants, 2 Affiliated entities and 5 Associated partners

Industry and end users

Industrial partners

VOLVO, DAF, einride, DFDS, FREE, Technolution, MAERSK, enide, GRUBER LOGISTICS

Industrial clusters & networks

ITS Norway, in-move, alice, CLEPA

Terminals

RRO, APM TERMINALS

Public partners

new mobility solutions Hamburg, Statens vegvesen, Rijkswaterstaat Ministerie van Infrastructuur en Milieu, Hamburg, VIKEN FYLKESKOMMUNE, Kartverket

Research and evaluation

SINTEF, TNO innovation for life, TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY, UNIVERSITY OF APPLIED SCIENCES, ASTAZERO, tøi, Lindholmen Science Park, bast

Associated partners

ASKO, MOSS HAVN, HPA Hamburg Port Authority, Vejdirektoratet, TRAFIKVERKET

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Forventa resultater

MODI KEY RESULTS

CCAM vehicles at TRL 7 suitable for L4 demos on public roads & confined areas on the logistic corridor between The Netherlands and Norway.

Interface for efficient coordination of vehicles in public & confined areas, adding more benefits to **CCAM vehicles** use.

Design of Physical and Digital Infrastructure for supporting L4 CCAM vehicles, co-created and verified by relevant stakeholders.

New viable business models and tools creating value along the logistic chain by utilizing CCAM technology and vehicles.

Assessment of environmental, safety, operational, and socio-economic **impacts** to support the recommendation of CCAM deployment in logistics.

Lessons learned and **book of recommendations** on CCAM vehicles, PDI, regulation, harmonization, and standardization to accelerate CCAM adoption in logistics.

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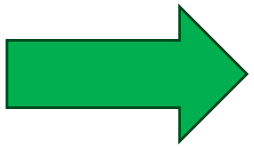
Gjennomgående fokus på standardisering i hele prosjektet

Task 1.4 Regulation, harmonisation and standardisation (Lead: BAST, Partners: ITSN, NMA, SIN, TOI, EIN, NPRA, AZ, LSP, ITSH) [M6 M42]
Subtask 1.4.1 Regulation, harmonisation, and standardisation for UCs
In this task, regulation, harmonisation and standardisation barriers and issues for the UCs will be analysed and solutions will be provided for the UCs. The focus point is the different regulations in the different countries and the barriers at border crossings. BAST is responsible for the view towards regulation and possible changes in regulation on European, national and UN levels. TOI will analyse the power relations between the different standardisation organisations and prepare a strategy for getting the recommendations defined in task 1.4 implemented in relevant ISO standards (ISO TC211 WG10, ISO TC204 WG3, ISO TC211 JWG11, ISO TC211 JWG14, TC211: AG for Strategy, TC211 AG for Out Reach). ITSN will participate with in-depth knowledge from membership in standardisation working groups, action groups, joint forces technical committees within ISO TC211. ITSH will contribute in particular on regulatory aspects and harmonisation. NMA will contribute with competence within the standardisation work related to maps and positioning. A focus will be to make the maps and positioning services seamless, crossing borders in all UCs. NMA and NPRA will focus on the standardization work related to C-ITS, CCAM services and vehicle sensor data used to create relevant map content for vehicles. NMA will secure maps and positioning services are align to a uniform geodetic reference frame across borders. SIN will share network and exchange information from relevant international



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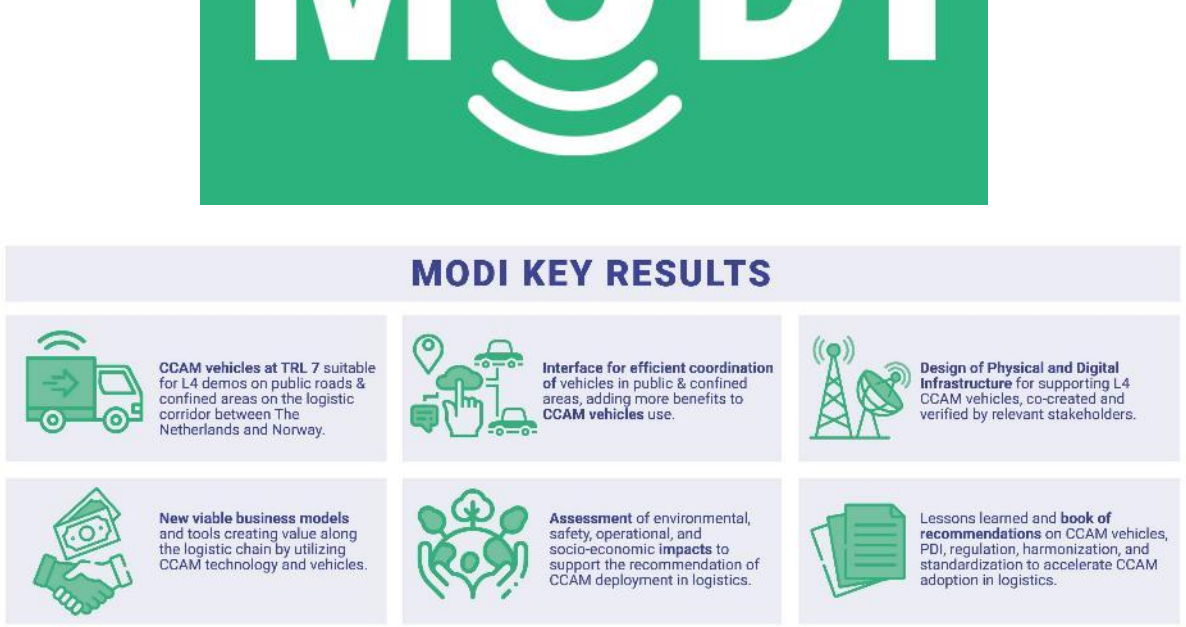
Hva har vi oppnådd?

- Fokus på standardisering i forskning på (nær) implementerbar teknologi
- Forankring av brukerbehov for standardisering og for konkrete standarder
- Synliggjøring av standardiseringsaktiviteter og –arenaer overfor nye aktører
  - Industri
  - Forskningsmiljøer



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Standardisering i MODI-rapporter

https://modiproject.eu/library/

D1.3 Report on border processes

D1.3 "Report on border processes" looks at regulatory changes, standardization and adaptations to the digital and physical infrastructure and requirements for higher communication and positioning networks that will be needed for efficient transfer of highly automated freight vehicles through custom inspections and crossings. The Deliverable explains critical terminology and basic technologies that are key to understanding the automation of border processes. From there it goes on to illustrate current processes using the more challenging EU/non-EU border between Sweden and Norway as case. The same case is then used to illustrate potential future processes, objects, and installments, as well as look at the critical role of standardized interfaces. Findings include that highly precise positioning and the correct reference frames will be key to ease the passage of automated vehicles through a border of any kind. Any variation in systems between countries or confined private and public areas will also be an obstacle to the roll-out of highly automated trucks in international logistics.

D4.4 "Collaborative CCAM Fleet- and Traffic Management" report explores how Traffic Management 2.0 can be extended to support the deployment of CCAM L4 freight vehicles by identifying key stakeholder roles such as Traffic Orchestrators, Transport Managers, and Confined Area Managers, and outlining 13 potential benefits, many achievable through logistics digitalisation even before full automation. It presents four practical use cases to illustrate these benefits and proposes a functional and technical architecture for implementing collaborative schemes. While benefits are mutual, challenges remain, such as limited public-sector interest in incoming logistics data. Recommendations include further research into strategic data-sharing practices, alignment with legislative frameworks, and the adoption of shared data standards like DATEX II to support scalable, EU-wide collaboration.

D4.2 "Optimal Designs of Physical and Digital Infrastructures at Public Roads" evaluates the infrastructure requirements for implementing SAE Level 4 automated freight transport along the MODI corridor, connecting the Netherlands to Norway. This evaluation draws on prior studies, stakeholder input, and MODI research, including data collection and Use Cases.

The report examines physical and digital infrastructure needs along the MODI corridor, including special sections such as tunnels, bridges, and toll plazas. The findings suggest that large-scale upgrades of the physical infrastructure are unnecessary for L4 CCAM deployment, as the existing infrastructure meets most requirements. Instead, the emphasis should be on developing a robust digital infrastructure to support automated driving. However, minor improvements in the physical infrastructure, such as improved quality of signage and markings, may still be beneficial. The report highlights the importance of collaborative standardization across physical and digital infrastructures to support safe and efficient L4 CCAM vehicle operations. Aligning and implementing standards for road markings, signage, connectivity protocols, HD maps, and positioning technologies is vital for a harmonized framework that enables consistent and efficient CCAM features. These findings are fundamental to MODI's goals to accelerate automated freight transport in Europe, laying the groundwork for infrastructure enhancements to support the safe and effective operation of L4 freight vehicles across European corridors.

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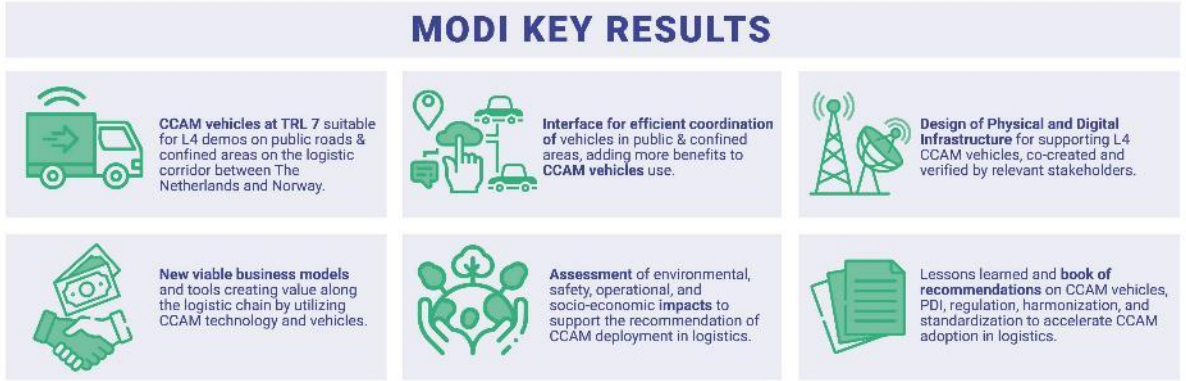
Utfordringer

- ITS domineres av industrien
  - Konkurranse og proteksjonisme
  - Industristandarder og proprietær teknologi
- Uavhengige standarder er viktig for å
  - Redusere avhengighet av enkeltaktører
  - Sikre tydelig og autoritativ informasjon til kjøretøyene



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