

OVERBLIKK

HVA SKJER INNEN SELVKJØRENDE BILER
(«Bruttopresentasjon»)

INNLEDNING

- Det er i dag mulig å typegodkjenne nivå 3 og mulig nivå 4, men med omfattende begrensninger i bruksområder, hastighet, type veier, kun små volumer av biler, osv.
- **Norge er «på hugget», og har i flere år hatt mulighet for prøveordninger etter godkjenning fra SVV; ref. Brønnøy Kalk i Brønnøysund.**
- Norge kommer nok til å følge EU etter hvert som det åpnes opp derfra, er mitt inntrykk så langt.
- Men: likevel ser jeg en viss / økende skepsis, bl.a. etter Teams-møte med Stein-Helge Mundal fra SVV 27. nov. 2023. Det var han som hadde innlegg om dette på Støtvig i juni 2023.
- Han mener å se at industrien forsøker å skyve ansvaret fra seg og over på føreren.

Det er ikke mitt inntrykk. Selv om industrien v/ OICA osv. presser på for at det skal åpnes for nivå 3 – 4, er nok enkeltprodusenter mer forsiktige med å gå for fort frem, med tanke på nettopp ansvaret som ligger der når noe skjer.

- **Som jeg har nevnt, har OICA et mål om å kunne sertifisere / typegodkjenne nivå 3 – 4, uten de fleste av disse begrensningene, innen 2025, men de tror ikke på dette før ca. i 2027. Se senere bilde under OICA.**

- 11.12.2023, Tore Lillemork

Hva gjelder i Norge?

- Bilprodusentene trenger oversikt over lokale regler når det gjelder selvkjørende biler
- Stedet å henvende seg til fremover er Statens vegvesen (SVV)
- SVV har i flere år hatt [prøveordning for selvkjørende biler](#), hjemlet i [Lov om utprøving av selvkjørende kjøretøy](#)
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**Uttrekk fra innlegg av Stein-Helge Mundal,
Statens vegvesen,**

Servicemarkedsforum, Støtvig, 16. juni 2023



Statens vegvesen

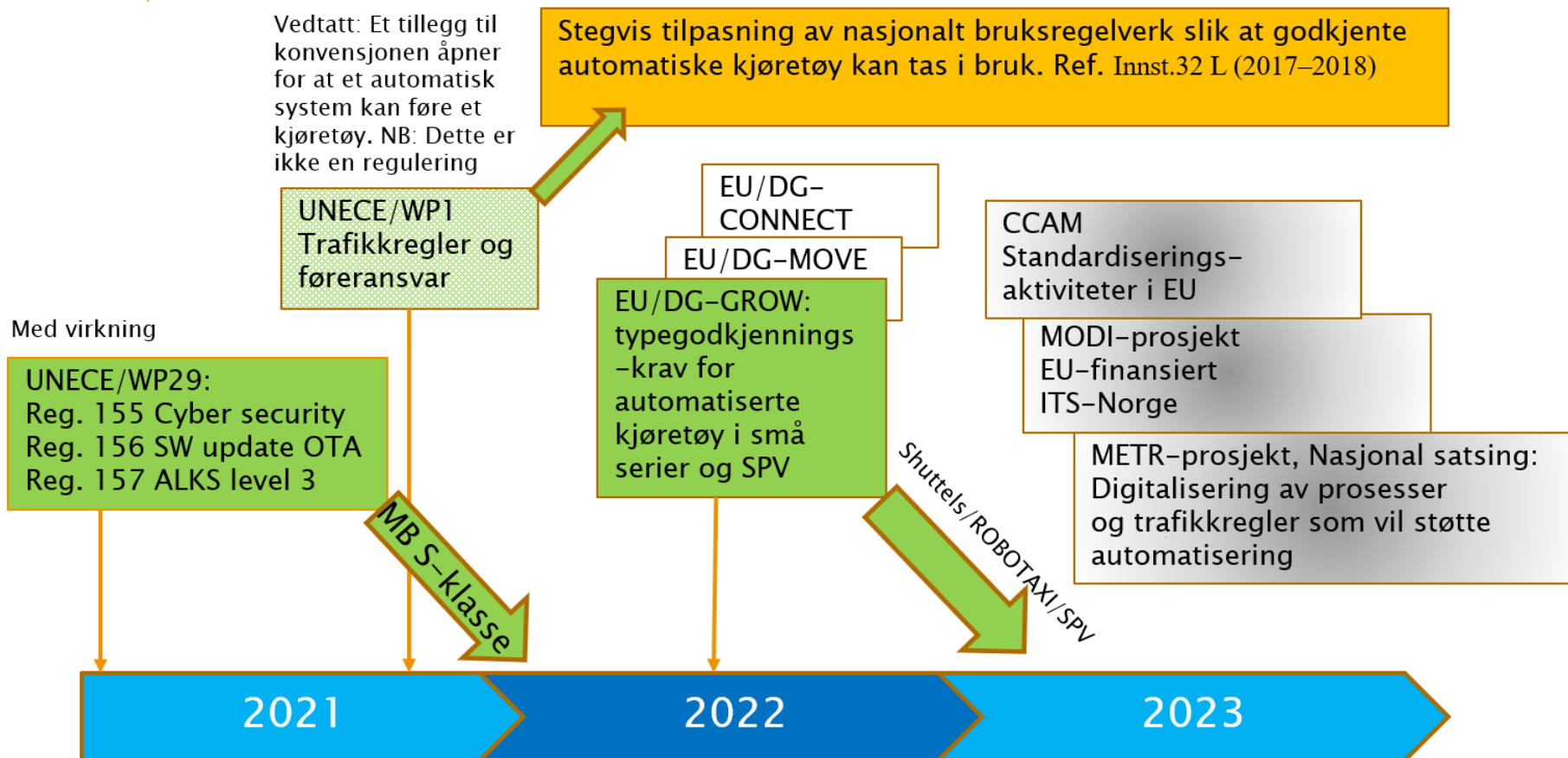


ITS: førerstesystemer (ADAS) og automatiske systemer (ADS)

BULK 16.06.2023



Aktuelt NÅ





Automatiseringsnivåer UNECE 2019: (basert på SAE) Statens vegvesen

Merk: Ikke tatt inn i regulering

UN Reg. 79
UN Reg. for DCAS

UN Reg 157

(EU) 2022/1426

UN Reg. XX/GTR XX

THE 5 LEVELS OF DRIVING AUTOMATION

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
What does the driver have to do?	<p>The driver is in control whenever a support function is engaged – even if the driver’s feet are off the pedals and the driver not steering</p> <p>The driver shall constantly supervise these support functions; the driver must steer, brake or accelerate as needed to maintain safety</p>		<p>The driver is not driving when these automated driving systems are engaged – even if the driver is seated in the driver’s seat</p>		
	<p>DRIVER SUPPORT FEATURES</p>		<p>AUTOMATED DRIVING FEATURES</p>		
What do these features do?	<p>These functions provide steering or brake/ acceleration support to the driver</p>	<p>These functions provide steering and brake/ acceleration support to the driver</p>	<p>When the system requests</p> <p>The driver must drive</p>		<p>These automated driving systems will not require the driver to take over driving</p>
Examples of features	<p>-Lane keeping or -adaptive cruise control</p>	<p>-Lane keeping (e.g. ACSF UN Reg. 79) and -adaptive cruise control at the same time</p>	<p>-traffic jam assist - ALKS - new UN Reg</p>	<p>-Local shuttle -Local taxi</p>	<p>-same as level 4, but the systems can drive everywhere in all conditions</p>



Automatiseringsnivåer UNECE 2019: (basert på SAE) Statens vegvesen

Merk: Ikke tatt inn i regulering

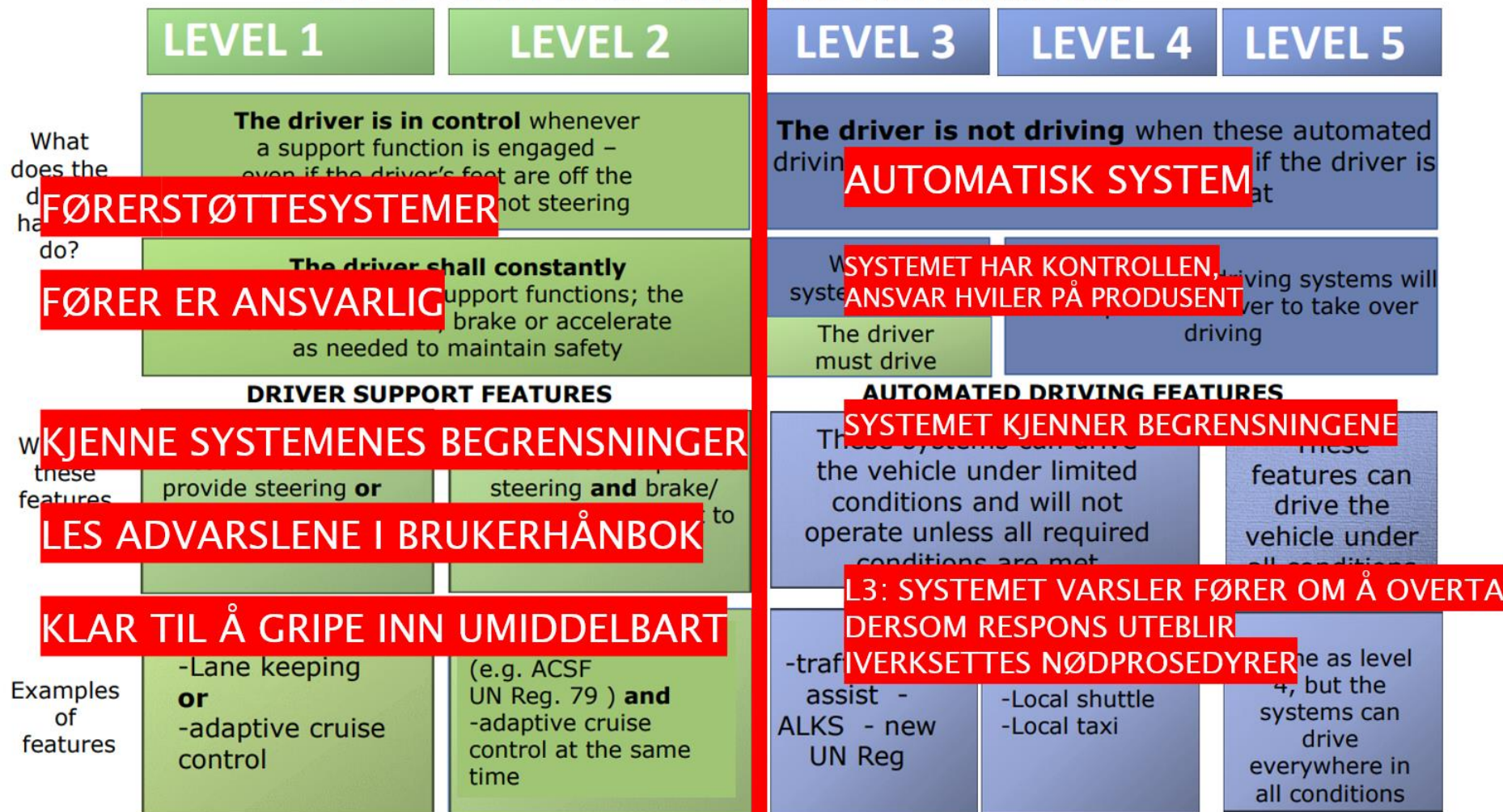
UN Reg. 79
UN Reg. for DCAS

UN Reg 157

(EU) 2022/1426

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THE 5 LEVELS OF DRIVING AUTOMATION





UN-ECE: Comming Regulation XX for DECAS (nivå 2)

Introduction [Placeholder]

Note: This section is under development by the Drafting Group.

Driver Control Assistance Systems (DCAS) addressed in this UN Regulation are driver-operated vehicle systems assisting a human driver in performing dynamic control via sustained lateral and longitudinal motion-control support. The availability of a DCAS to the driver and its capability to assist are constrained by the system's boundaries.

DCAS is only assisting the human driver and does not replace them and therefore does not change the driver's responsibilities for control of the vehicle. Hence DCAS does not aim to permit activities other than driving in addition to those permitted for manual driving

This regulation shall only be applied to DCAS functionality if it contains at least one specific feature, which is described under section 6 in this regulation.

2. Definitions [Placeholder]

Note: This section is under development by the Drafting Group.

For the purposes of this Regulation:

- 2.1. "Driver Control Assistance System (DCAS)" – hardware and software collectively capable of assisting a driver in controlling the longitudinal and lateral motion of the vehicle on a sustained basis containing at least one specific feature, which is described under section 6 in this regulation, of this regulation, and which requires the driver to be permanently engaged and to monitor the environment, and vehicle/system performance.
- 2.2. "(DCAS) Feature" – [means a capability of a DCAS providing assistance to the driver in defined circumstances (depending on e.g. roadway characteristics, traffic and environmental conditions)]

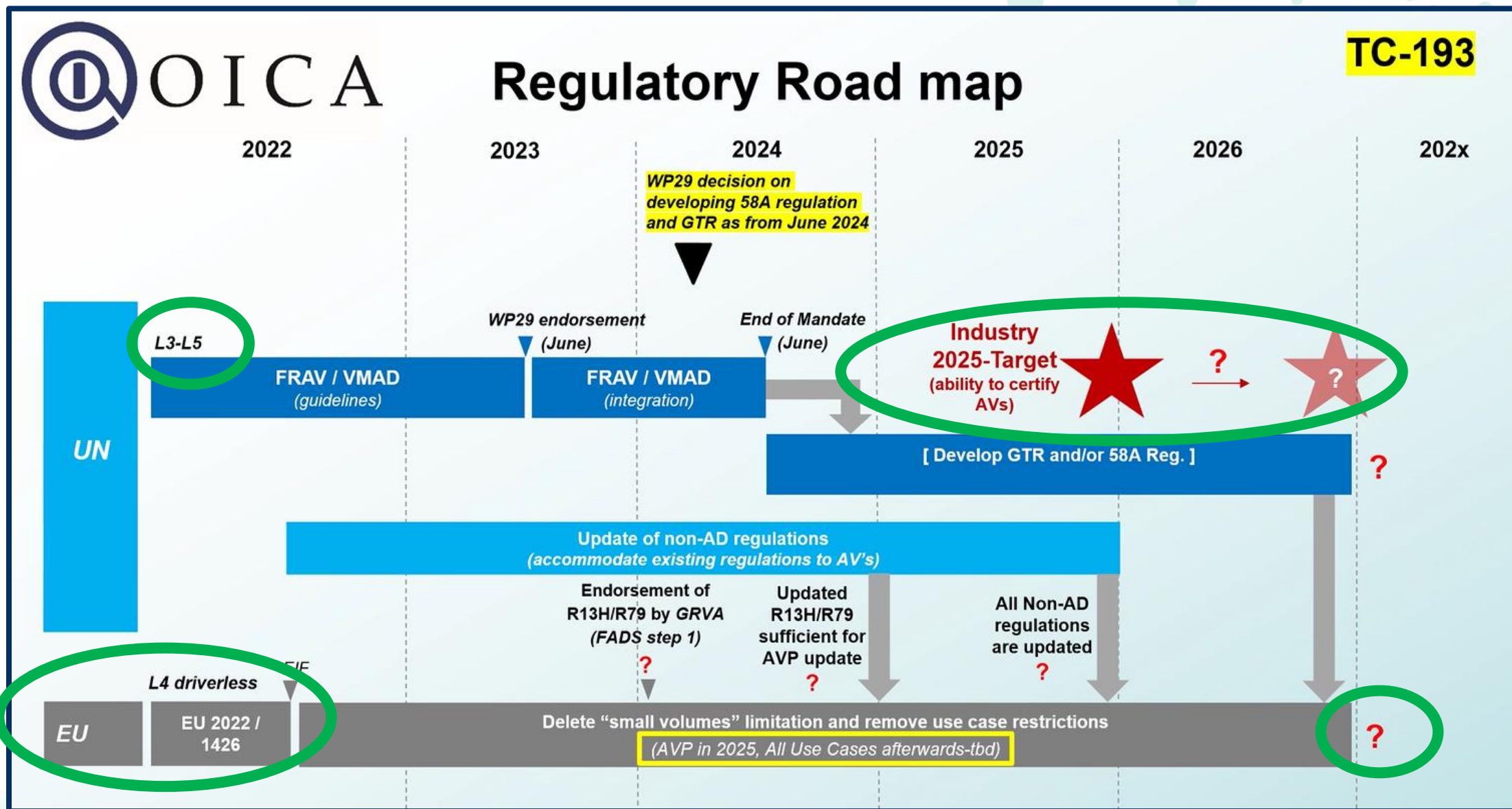


UN-ECE: Comming Regulation XX for DECAS (nivå 2)

- Førerstøttefunksjoner tilnærmet «selvkjøring» med ansvarlig sjåfør
- Utfordring: Hvordan sikre «driver in the loop» og unngå forveksling med ADS?
- Hvordan unngå forveksling med ADS?
- Hvordan forstå HMI (bruken, begrensinger, varslinger)
- Siste forslag fra industrien: «Hands-OFF» driving (hands-off/eyes on, autonomous level L2.....)

Litt fra OICA Technical Committee

OICAs Roadmap for Automated Driving Systems (ADS) – pr. OICA Technical Committee 193, Istanbul, 17.-18. oktober 2023



➤ UN R79 (Steering assistance)

- Remote Control Parking (RCP) for combination
 - ❖ RCP covers low-speed maneuvers for M and N
 - ❖ Industry official GRVA document
 - ❖ Industry expected to organize technical meeting to address CPs concern
- ACSF-B1 Emergency corridor
 - ❖ No progress
 - ❖ **New OICA approach:**
 - Work on it in the frame of DCAS regulation.
 - Carry it back to R79 afterwards, if possible.

➤ New DCAS regulation (Driver Control Assistance Systems)

- Agreement to prioritize items in **two steps**:
 - Priority 1: - General requirements
 - Driver initiated maneuvers (beyond R79)
 - Priority 2: - System-initiated maneuvers
 - Hands-free driving
- Priorities still to be finalized. (see EC doc. GRVA-17-25)
- 1st step for endorsement at **GRVA of Jan 2024**
- Highlights:
 - ❖ DSSAD for DCAS ? (potential collaboration between TF-ADAS and EDR/DSSAD IWG)
 - ❖ Relationship between R79 and DCAS regulation.
 - ❖ Speed limit compliance

➤ **AEBS virtual testing** (GRVA/2023/22 and GRVA-17-22)

- Proposal from France to regulate the use of virtual testing for approval.
- The proposal is building on VMAD NATM.
- Concerns from industry, Germany, NL and UK...
- Workshop on November 7 (Paris), to address concerns from industry, Germany, NL, UK...

➤ **Urban Emergency Braking System (UEBS)**

- UEBS is on-hold, yet kept on agenda of GRVA
- UEBS is subject to progress at GRSG on Emergency Motion Inhibit System (EMIS)
- To be monitored

➤ **Acceleration Control for Pedal Error (ACPE)**

- Confirmation that HCVs are excluded from scope
- Industry proposal to keep M1 only (exclude N1)
- 2-steps: low-speed then “high-speed” (up to 30km/h)
- Target: endorsement at GRVA of May 2024

➤ **Lane Departure Warning Systems (LDWS)**

- Series 01 to UN R130 endorsed, for March WP29
- Add-on of Australian lane markings
- Certification / product upgrade for NT 2026, AT 2028
- Cross-references to R130 lane markings:
 - ❖ R79: supplements to 03 and 04 series endorsed by GRVA for March WP29 (see previous slides)
 - ❖ R157 ALKS: still to be reviewed

Definition :

The **Data Storage System for Automated Driving** is a device or a function that :

records and stores a set of data (“timestamped flags”) during the automated driving sequences

of any vehicle equipped with Level 3 / Level 4 / Level 5 Automated Driving Systems (ADS),

in order that **whenever a significant safety related event occurs**, it can provide

a clear picture of the **interactions between the driver and the system**,
before and after (*whenever possible*) the event, in order to **establish** :

- if the driver or the system was requested to be in control of the driving task, and

- **who was actually performing the driving task.**

GEVA Chair Highlights

OICA TC-193

October 2023

*Pierre Teyssier
Olivier Fontaine*

Homologation:

Agreements and Conventions



UNECE

> 1949

Geneva Convention
on Road Traffic
Driving laws, traffic signs

Behavior

> 1968

Vienna Convention
on Road Traffic
Human driver is required
(74 countries signed ww)
Non-ratified countries:
USA, CAN, AUS and CHN

Behavior

> 2015

Driver can also be a
"vehicle system"

> 2018 in discussion !

"Vehicle systems taking
over all"
with / without
geographical limits

Driverless Mobility

> 1958

Agreement concerning the
**adoption of uniform technical
prescriptions** for wheeled
vehicles, equipment and parts

Technical

> 1998

Agreement concerning the
**establishing of global technical
regulations** for wheeled
vehicles, equipment and parts

Technical

Fra ACEA Round table, General Assembly, Sao Paolo, oktober 2023

EUROPEAN AUTO INDUSTRY

NEW TECHNOLOGIES, DEPLOYMENT
OF AUTOMATED VEHICLES, NEW
MOBILITY PATTERNS

OICA Round Table

São Paulo, Brazil

Sigrid de Vries

ACEA Director General

27 October 2023



aceea

AUTOMATION & CONNECTIVITY

LEGISLATION IN EUROPE

- In Europe: since 2022, the homologation of highly automated vehicles (level 4) is possible
 - Limitations on use cases and volume
 - Current type approval and UNECE regulations prevent large-scale deployment
 - National legislation necessary to allow AV operation and licensing
 - Initiatives in France and in Germany
 - Other European states show limited interest so far
- Connected vehicles are a reality
 - Main uses: information, entertainment, navigation
 - ITS for safety purposes: still limited – no legislative mandate to guarantee Europe-wide ITS infrastructure

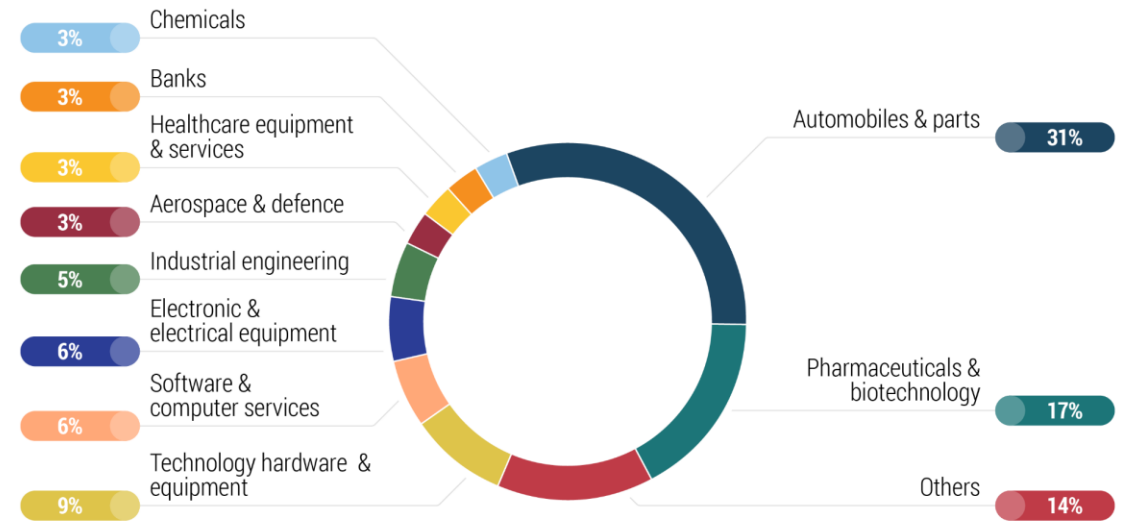


AUTOMATION IN THE REAL WORLD

- Automation is seen by the motor industry as a high potential technology

SECTORAL R&D SHARE IN THE EU

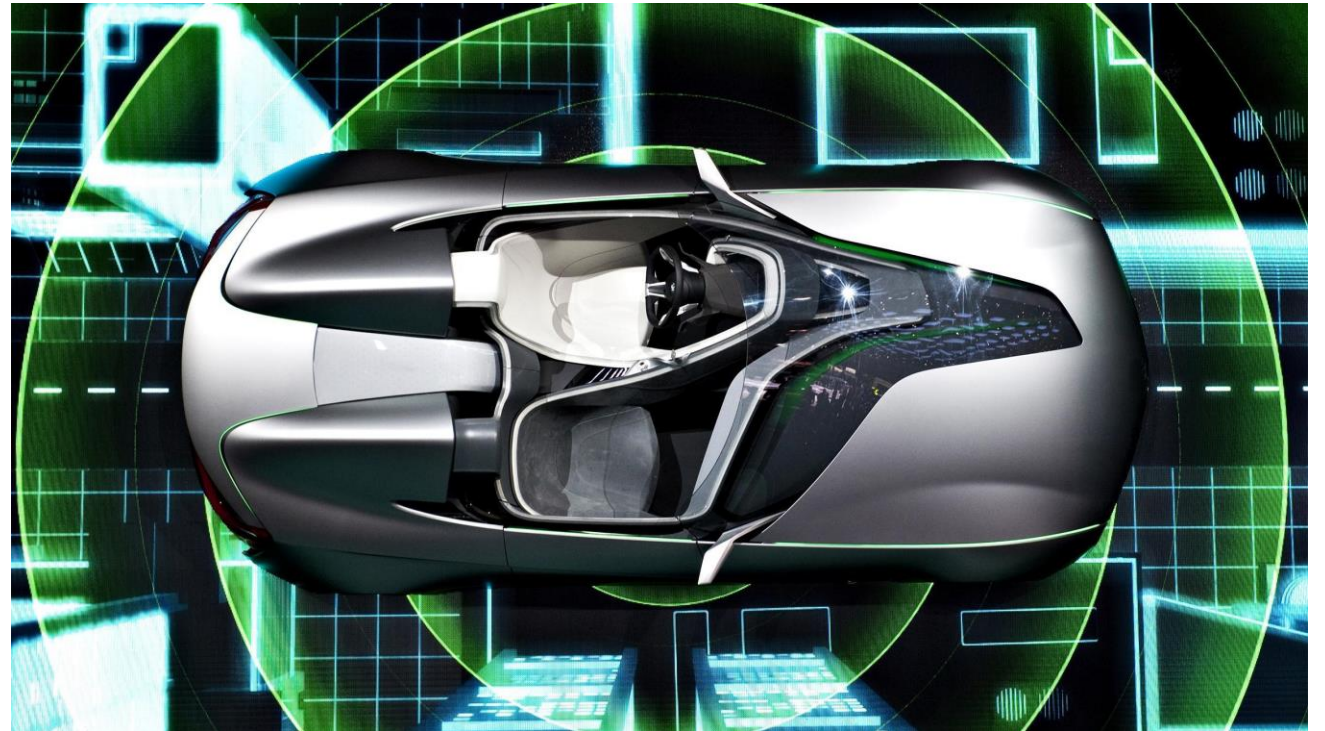
% share / 2021



- Promise of greater safety, comfort, and better road usage
- Part of the solution to commercial driver shortages
- Enabling new forms of mobility for elderly and disabled users
- Driving European competitiveness and innovation capabilities

AUTOMATION

- Highly automated applications are becoming clearer
 - Already a reality: automated valet parking, commercial yard operations
 - In the future: hub to hub freight transport, passenger services, last mile delivery, private vehicles on highways



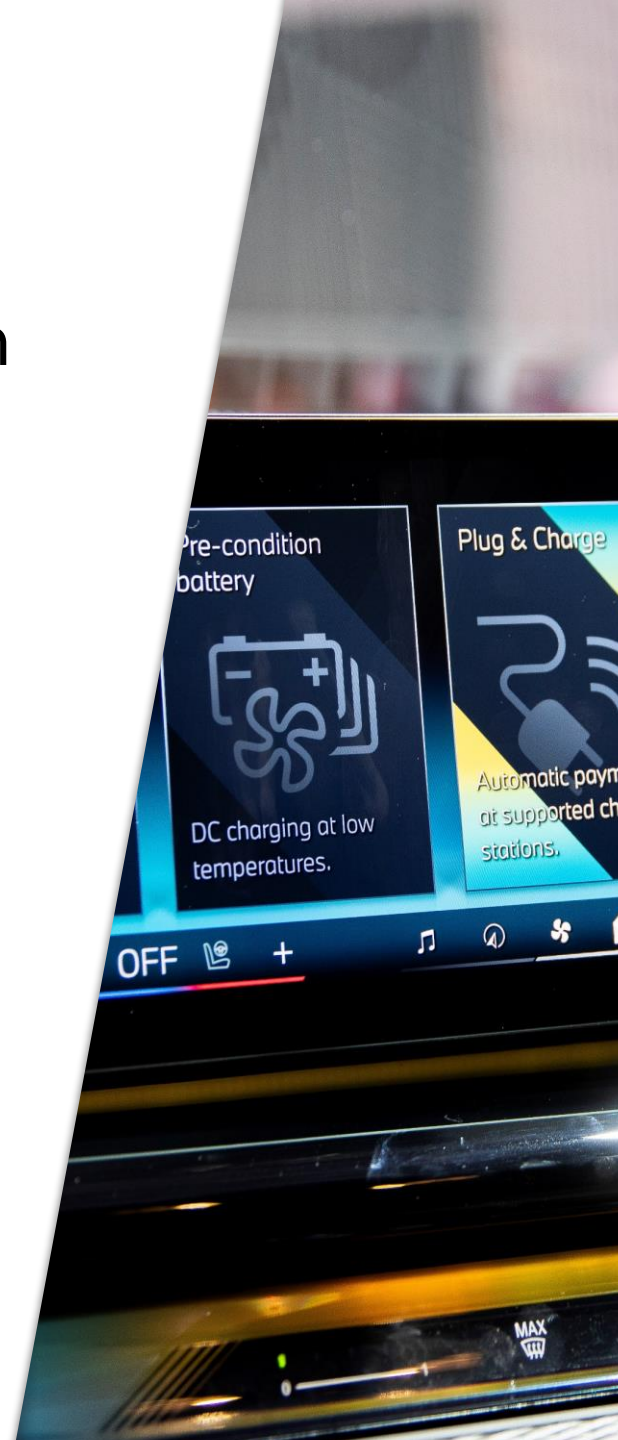
CHALLENGES TO AUTOMATION

IN LOW TO MIDDLE INCOME NATIONS

- Market reality: the business case for automation
 - Cost and availability of labour vs cost of automation
 - Is there a real demand or need for automation on those markets?
- Inadequate infrastructure
 - Road markings, signage needed by self-driving systems: often lacking
 - Strong connectivity needed to provide services based on automation
- In some countries: demanding driving environments
 - Unconventional traffic patterns
 - Varying respect of the rules of the road

AFFORDABILITY

- A growing challenge in times of technological transition
 - EV batteries and other alternatives remain expensive
- Tech content continues to increase
 - Competition to provide customers with more features
 - Regulations mandate more systems
- Advanced technology as a way towards affordability?
 - Active safety could reduce the need for complex collision mitigation
 - Greater mechanical simplicity in EVs
- Smaller, lighter, cheaper: do we need a new approach to personal vehicles?
 - A matter of reflection for the European industry today



THE RISE OF SOFTWARE

SOFTWARE-DEFINED VEHICLES

- **Software: the future foundation of the vehicle**
 - All vehicle functions controlled by software as opposed to specialised electronics
 - A source of greater flexibility, customisation, and lower hardware costs
 - A source of new challenges for manufacturers: development processes, talent availability and retention, cybersecurity
- **Software-defined vehicle research ongoing in Europe**
 - Potential for better standardisation of in-vehicle software interfaces
 - Joint research efforts between EUCAR and the European Commission

Litt mer bakgrunn – teknologisk utvikling

TRENDER

ZF Software Defined Car

The software-defined car requires innovative smart systems

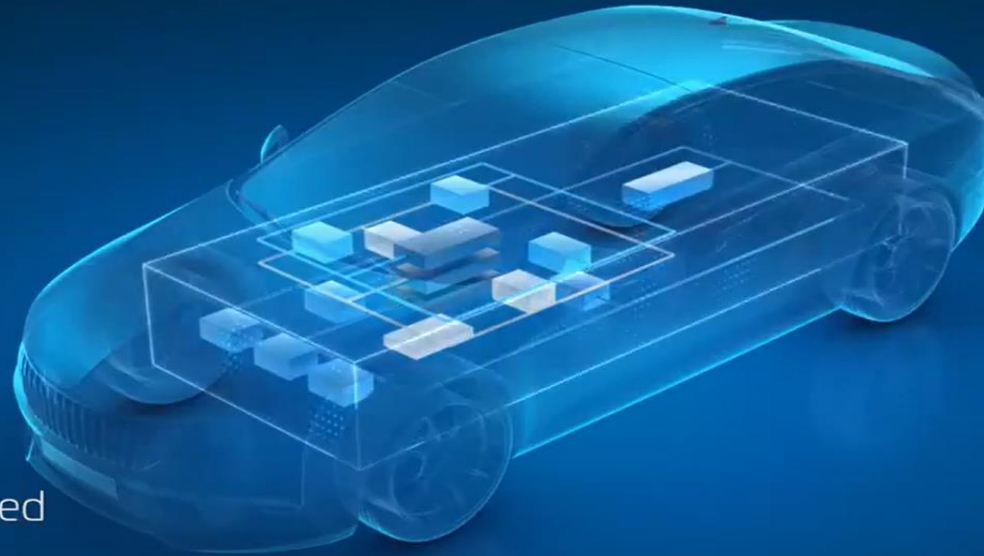
Hardware

Smart actuators

Intelligent sensors

More processing power

Domain or zone-based E/E architecture



Software

Hardware independence

Flexibility

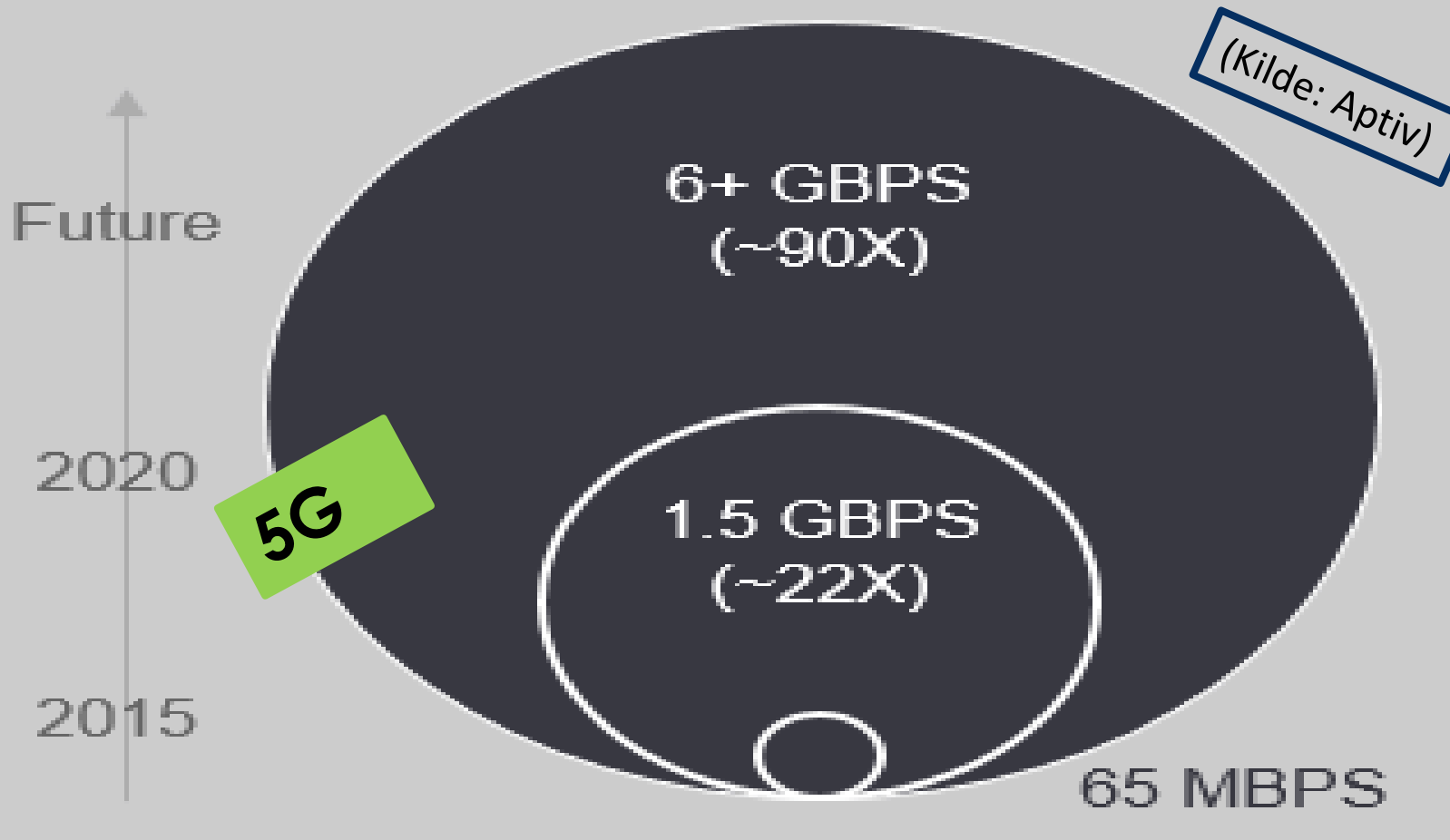
Scalability

Compatibility

Upgradability

“The software-defined vehicle is the next evolutionary step in the automotive industry” (Continental)

DATA TRANSFER SPEEDS

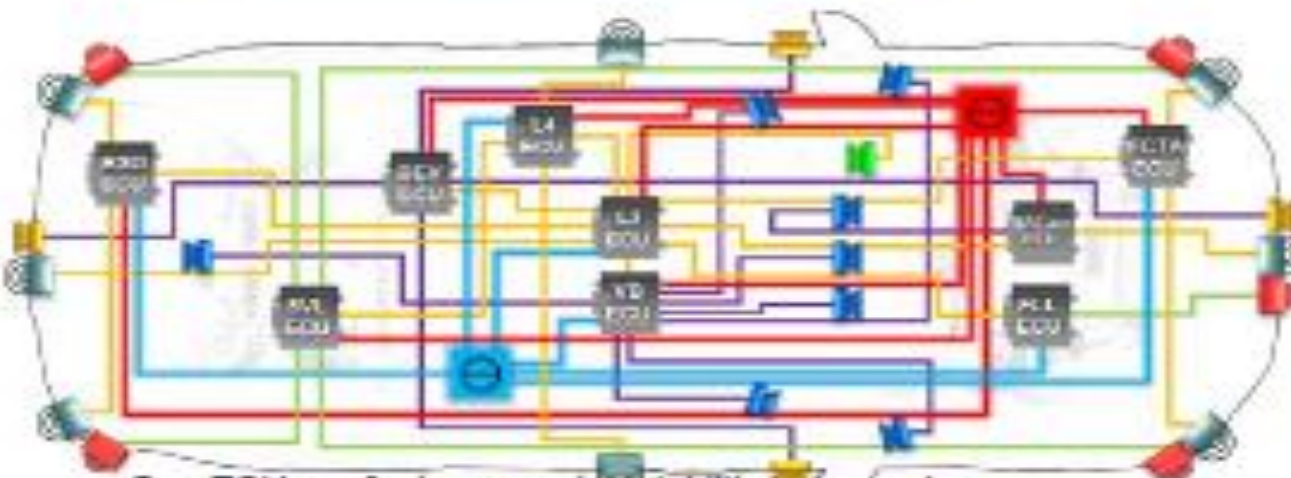


Bilens software over the air (SOTA)

"The average modern car has up to 150 electronic control units (ECUs) running up to 100 million lines of code. In comparison, the F-35 fighter jet had fewer than 25 million lines of code" (Analog.com)

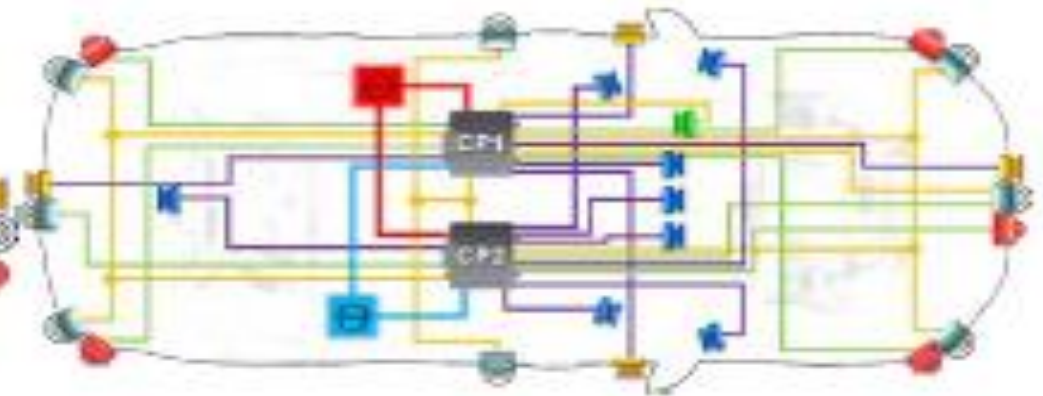
Vehicle Architecture Comparison

Classic Architecture



- One ECU per feature, great scalability but complex system integration
- Limited 360° fusion capabilities results in poor environmental model
- Fixed feature set, no evolution over time

Satellite Architecture



- Centralized computing enables reduced complexity, weight and packaging size
- Centralized fusion from different sensors and sensor types leading to high quality environmental model
- Functional growths over time with software over the air

DATA FRA BILER / CONNECTIVITY

- Hvordan / hvem håndtere data fra biler?
 - «Access to in-vehicle data»
- Stadig mer OTA (Over The Air) - «over hodet» på så vel forhandler som importør?
 - Oppdatering av soft-ware, mer effekt, utstyr / funksjoner
- Selvkjøring
- 5G
- AI
- CS (Cyber Security)

- GDPR