OICA   CLEPA
European Association of Automotive Suppliers
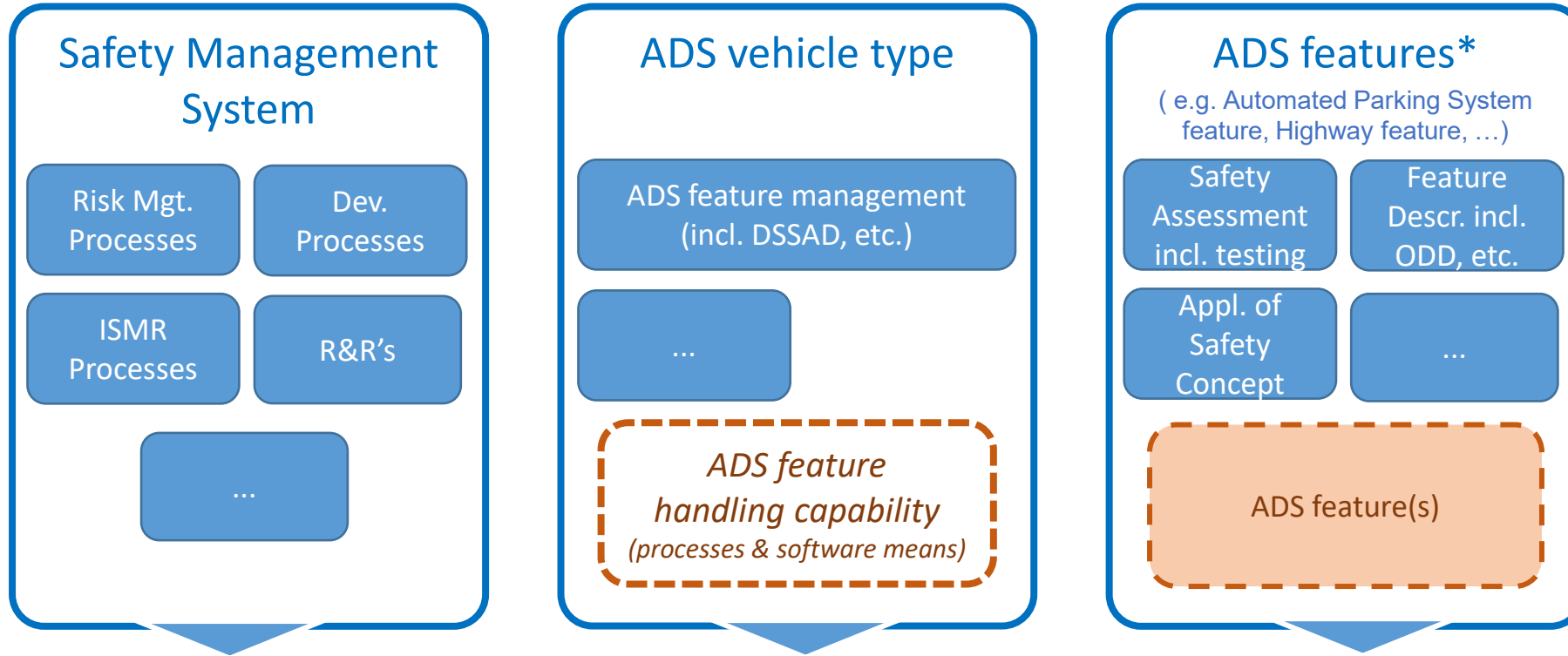
Considerations on a new approach for the ADS Regulation

- Motivtion and conceptual overview -

Motivation for developing a new Regulation approach for ADS

- Dynamic feature management and updates, incl. new features over vehicle lifetime seen as an important item for ADS

- In case of using system Regulation approach as of today, for countries applying the type approval scheme, the system approvals are referenced in the Whole Vehicle Type Approval documentation, which is the basis for further documents, i.e. COC and registration documents.

- Even though UN R156 supports the process for updating software over the vehicle lifetime, the issue on non-harmonized national rules on modification of registered vehicles in the field remains

- The concept of a new Regulation approach for ADS was identified to address this remaining issue by not requiring the modification of registration documents

UN Reg on ADS (58A)
Regulatory approach

Safety Management System
- Risk Mgt. Processes
- Dev. Processes
- ISMR Processes
- R&R's
- ...

→ SMS certificate/ approval

The SMS applies to both, the ADS vehicle type and the ADS feature and is a pre-requisite for applying for approval of such

ADS vehicle type
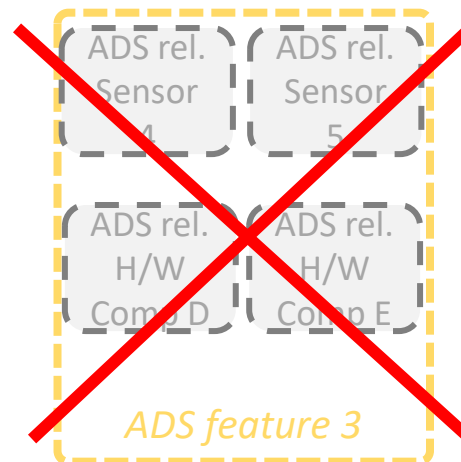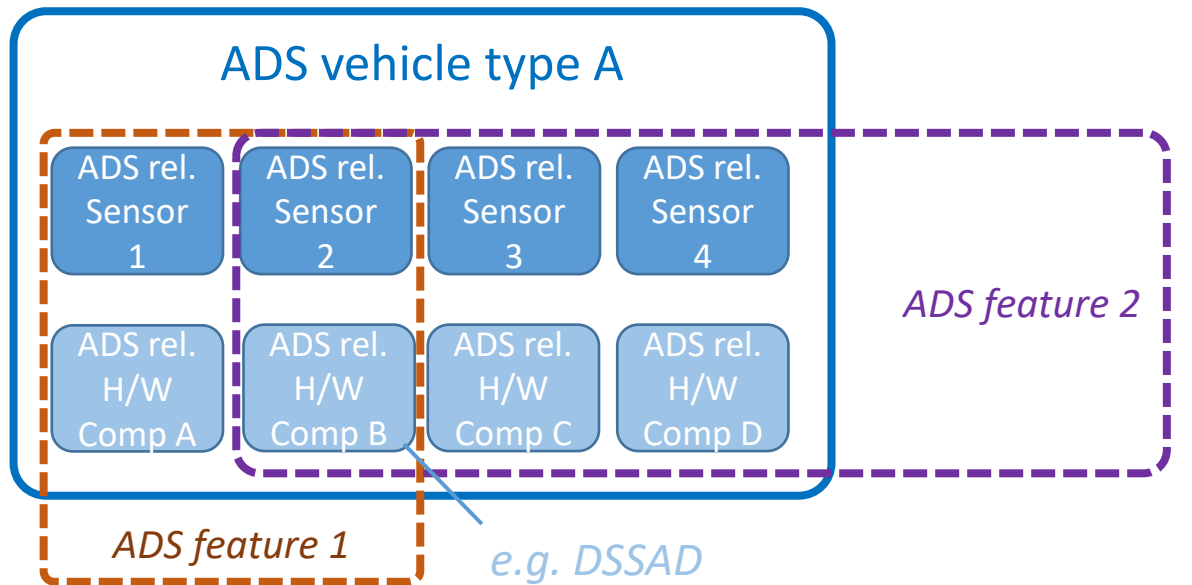- ADS feature management (incl. DSSAD, etc.)
- ...

ADS feature handling capability (processes & software means)

→ ADS vehicle approval

The approvals of ADS features and ADS vehicles type leagally are two independet approvals

ADS features*
(e.g. Automated Parking System feature, Highway feature, …)
- Safety Assessment incl. testing
- Feature Descr. incl. ODD, etc.
- Appl. of Safety Concept
- ...

ADS feature(s)

→ ADS feature approval(s)

*Reminder (WP.29/2024/39): 3.1.3. *"ADS feature"* means an application of an ADS designed specifically for use within an Operational Design Domain (ODD).

Further consideration of how to structure the ADS Regulation to cover the three subjects

UN Reg on ADS (58A)

ADS vehicle type A

- ADS rel. Sensor 1
- ADS rel. Sensor 2
- ADS rel. Sensor 3
- ADS rel. Sensor 4
- ADS rel. H/W Comp A
- ADS rel. H/W Comp B
- ADS rel. H/W Comp C
- ADS rel. H/W Comp D

ADS feature 2

ADS feature 1

e.g. DSSAD

- ADS rel. Sensor 4
- ADS rel. Sensor 5
- ADS rel. H/W Comp D
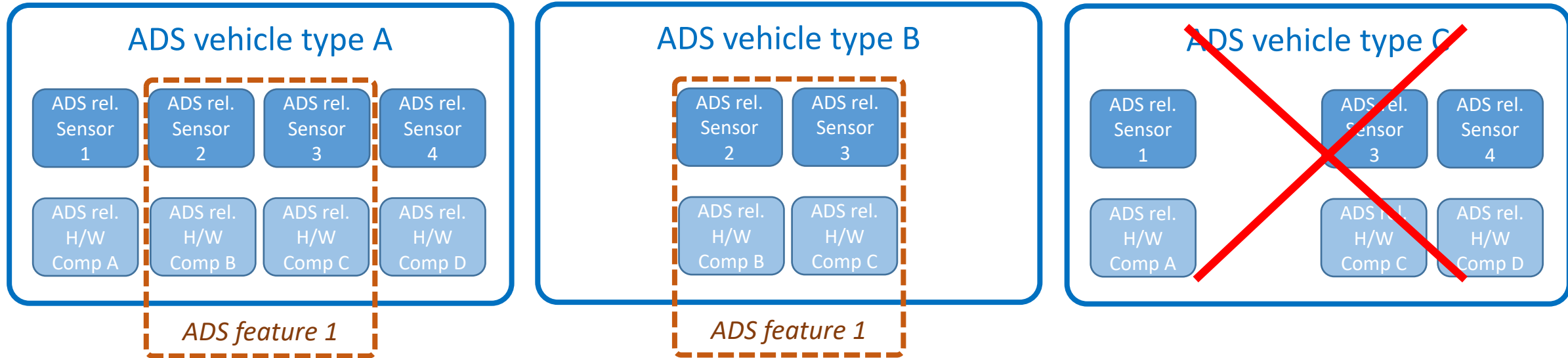- ADS rel. H/W Comp E

ADS feature 3

The ADS vehicle type is specified by a dedicated ADS architecture defined by an ADS relevant hardware/ sensor layout, which is outlined in the approval of the ADS vehicle type.

Various ADS features can be implemented for a given ADS vehicle type, potentially making use of a different hardware/sensor set. (see ADS feature 1 and 2 in the example)

ADS Feature 3 in this example would not fit to the given ADS vehicle type A, since the ADS feature 3 would require an ADS relevant Sensor 5 and ADS relevant hardware component E, which the ADS vehicle type A does not consist of.

UN Reg on ADS (58A)

ADS vehicle type A

ADS rel. Sensor 1 | ADS rel. Sensor 2 | ADS rel. Sensor 3 | ADS rel. Sensor 4

ADS rel. H/W Comp A | ADS rel. H/W Comp B | ADS rel. H/W Comp C | ADS rel. H/W Comp D

ADS feature 1

ADS vehicle type B

ADS rel. Sensor 2 | ADS rel. Sensor 3

ADS rel. H/W Comp B | ADS rel. H/W Comp C

ADS feature 1

ADS vehicle type C

ADS rel. Sensor 1 | ADS rel. Sensor 3 | ADS rel. Sensor 4

ADS rel. H/W Comp A | ADS rel. H/W Comp C | ADS rel. H/W Comp D

ADS feature 1 approval

This feature can be operated on:
*ADS vehicle type A*
ADS vehicle type B

An ADS feature can be approved for various ADS vehicle types, given that ADS feature fits to the ADS vehicle type.

In this example the ADS feature 1 fits to ADS Vehicle type A and B, which it is also approved for, but does not fit to ADS vehicle type C, where some required sensors are missing.

Measures will be implemented in the ADS vehicle type and ADS feature(s) to verify the validity for the combination thereof.

Regulatory approach – Safety management System

Safety Management System

Risk Mgt. Processes

Dev. Processes

ISMR Processes

R&R's
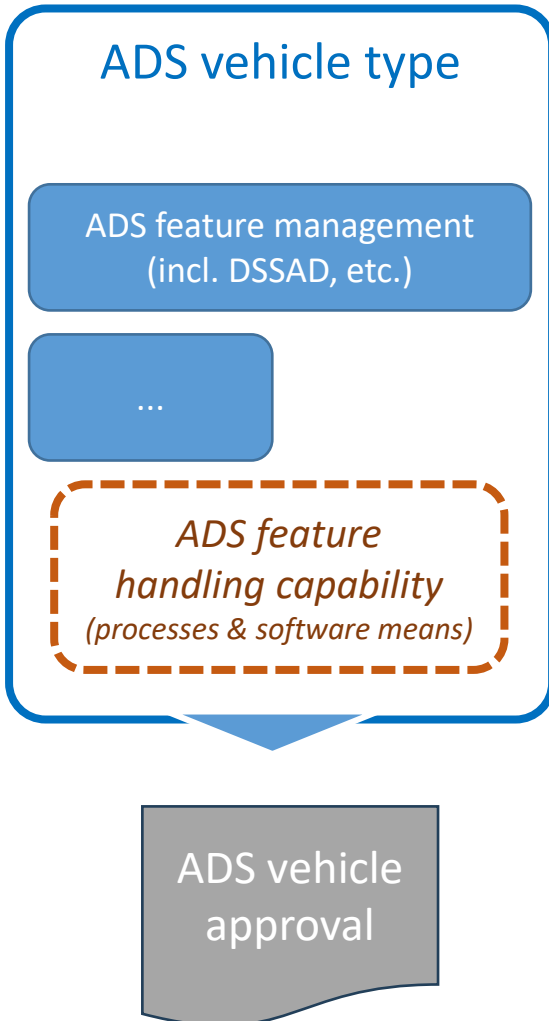
…
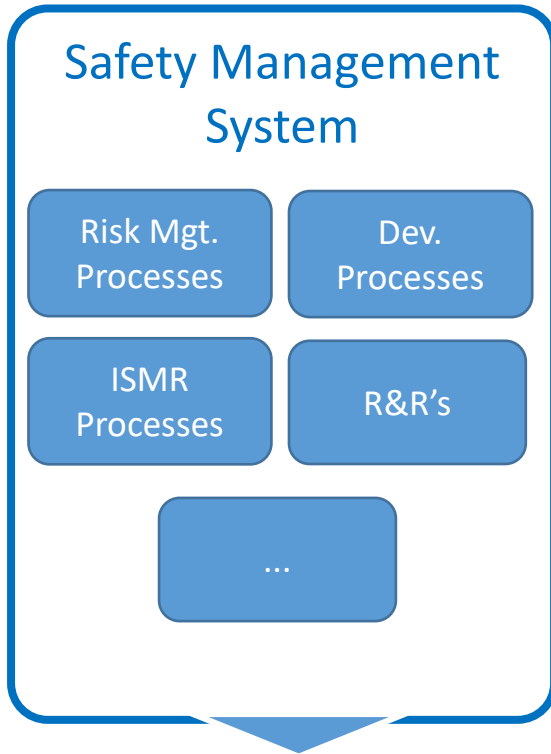
SMS certificate/ approval

Safety Management System:

The SMS should cover all aspects of a manufacturers capabilty to develop, produce and maintain ADS. This should also be reflected in the structure of the UN Regulation

$\Rightarrow$ All processes and manufacturer capability related topics to be part of the SMS

A certified SMS is in this regard a pre-requisite for the approval of ADS vehicle types and ADS features.

ADS vehicle type

ADS feature management
(incl. DSSAD, etc.)

...

*ADS feature
handling capability*
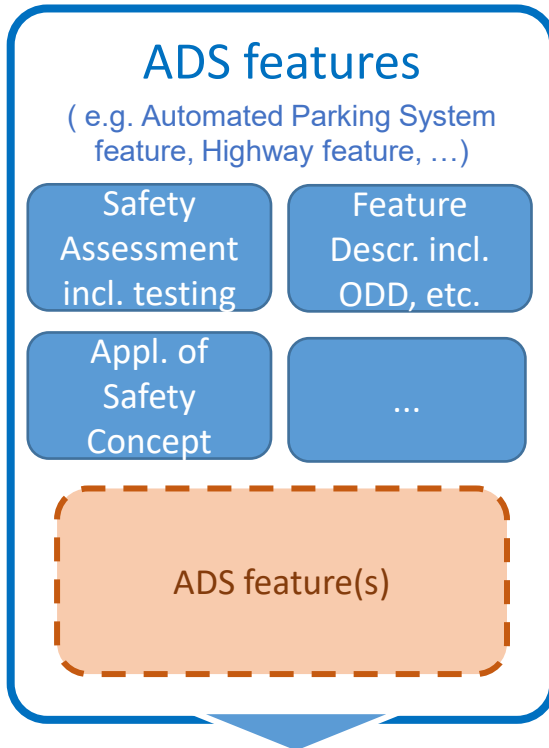(processes & software means)

ADS vehicle
approval

ADS vehicle type (=> Indication that the vehicle is "ADS ready"):

- Feature management (ADS handling capability):
    - *The ADS vehicle type shall be able to identify the validity of ADS feature(s) which can be enabled/operated on the individual vehicles*
    => process by manufacturer
    => (software) mechanism implemented in vehicle type to ensure that only type approved ADS features (for the considered vehicle type) can operate on the vehicle

    - Integration aspects of ADS features in the ADS vehicle type
    => Similar to installation requirements for approved components

    - Ensure that ADS features installed can be identified
    => read-out capability of software versions installed on a vehicle type

- ADS relevant Sensor/Hardware setup is part of the ADS vehicle type
=> information on the ADS relevant H/W layout to be provided for the approval

- Vehicle type definition to support ADS architectures to combine various vehicles in one ADS vehicle type approval (see UN R155 on Cyber Security)

- *The ADS vehicle approval does not list/contain the valid ADS feature approvals*
=> the goal is that there is no need to touch the ADS vehicle type approval in case of new features are being made available

UN Reg on ADS (58A)
Regulatory approach - ADS Features, overview

ADS features

(e.g. Automated Parking System feature, Highway feature, …)

Safety Assessment incl. testing	Feature Descr. incl. ODD, etc.
Appl. of Safety Concept	…

ADS feature(s)

ADS feature approval(s)

ADS feature(s) (=> The actual "ADS application", e.g. parking feature, highway feature,…):

- ADS feature capability incl. ODD description, safety assessment, V&V, …

- Required Sensor/H/W setup for the ADS feature

- *An ADS feature shall be able to identify the valid ADS vehicle type(s) it can be operated on*
  => (software) mechanism implemeted to identify the valid ADS vehicle type the feature can operate on

- *An ADS feature approval will list the ADS vehicle types it is designed for and can be operated on*

- *ADS features will not be approved completely indenpendent from the ADS vehcile types they are designed for*
  => compatibility of ADS feature with ADS vehicle type the feature is approved for has to be demonstrated

- ADS features need to be approved
  => similar to a component approval

Reminder: UN Regulation covering the ADS features should be generic not use-case by use-case based

Thank you