

# ASAM Regional Meeting South Korea 2023

## Introduction to ASAM



**Marius Dupuis**  
Chief Executive Officer, ASAM e.V.

September 12<sup>th</sup>, 2023

Jeju, KR

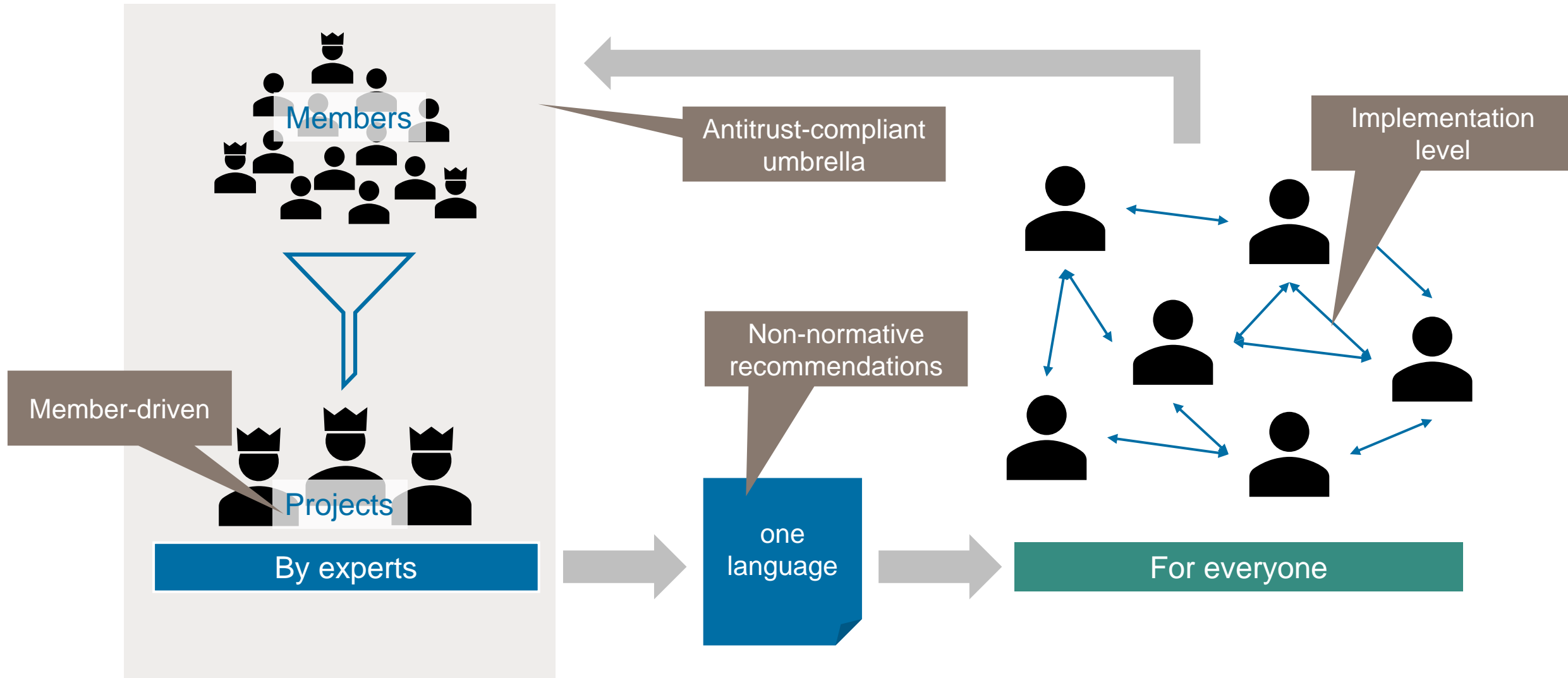


Association for Standardization of  
Automation and Measuring Systems

# ASAM in a nutshell

# The essence of ASAM ( Association for Standardization of Automation and Measuring Systems ) since 1998

How it works

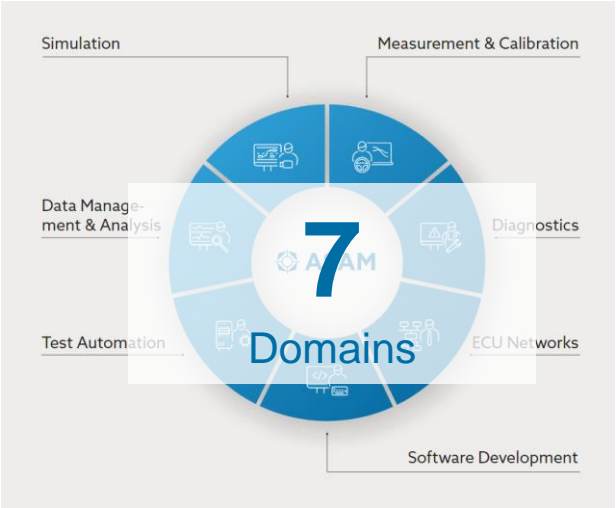


# ASAM in a nutshell

Statistics July 2023

**ASAM = Association for Standardization of Automation and Measuring Systems**

- founded in 1998 -



Measurement & Calibration	Diagnostics	ECU Networks	Software Development	Test Automation	Data Management & Analysis	Simulation
ARTI	MCD-2 D	MCD-2 NET	CC	ACI	CEA	OpenCRG
CDF	MCD-3 D		FSX	ASAP 3	ODS	OpenDRIVE
CMP			FSX	ATX		OpenLABEL
CPX			FSX	GDI		OpenODD
HMS			FSX	iLinkRT		OpenSCENARIO
MCD-1 CCP			FSX	MCD-3 MC		OSI
MCD-1 POD			FSX	OTX Extensions		
MCD-1 XCP			FSX	XIL-MA		
MCD-2 CERP			FSX			
MCD-2 MC			FSX			
MDF			FSX			

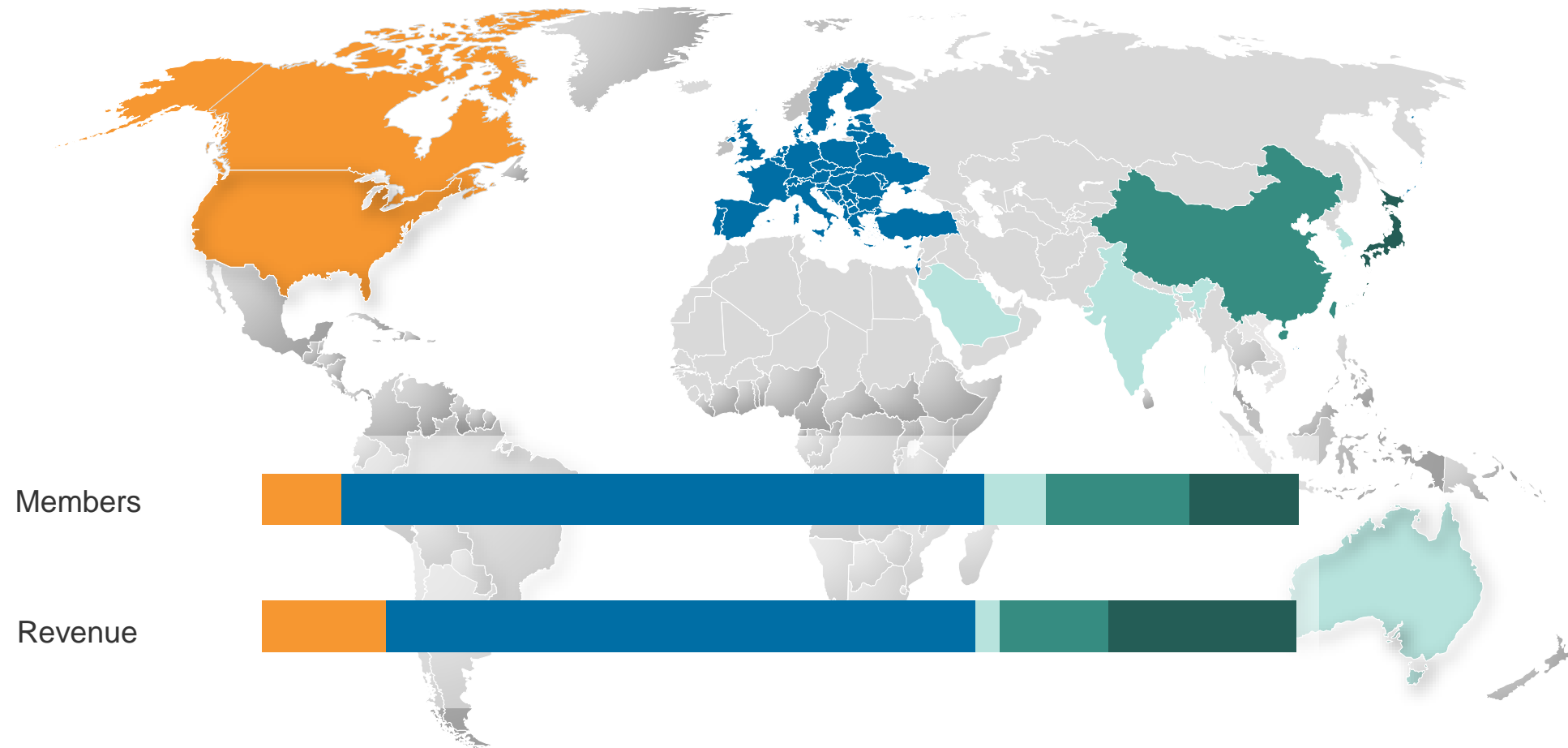
**37**  
Released Standards

**World-wide**  
Presence



# ASAM – a truly international association

Global distributions of members and revenue, forecast for 2024 (as of July 20<sup>th</sup>, 2023)



# New ASAM members in 2023

Since Jan 2023, 29 new organizations joined ASAM (+1 honorary member, +1 rebranded member)

## NORTH AMERICA



## CHINA



## JAPAN



## EUROPE



## REST OF WORLD



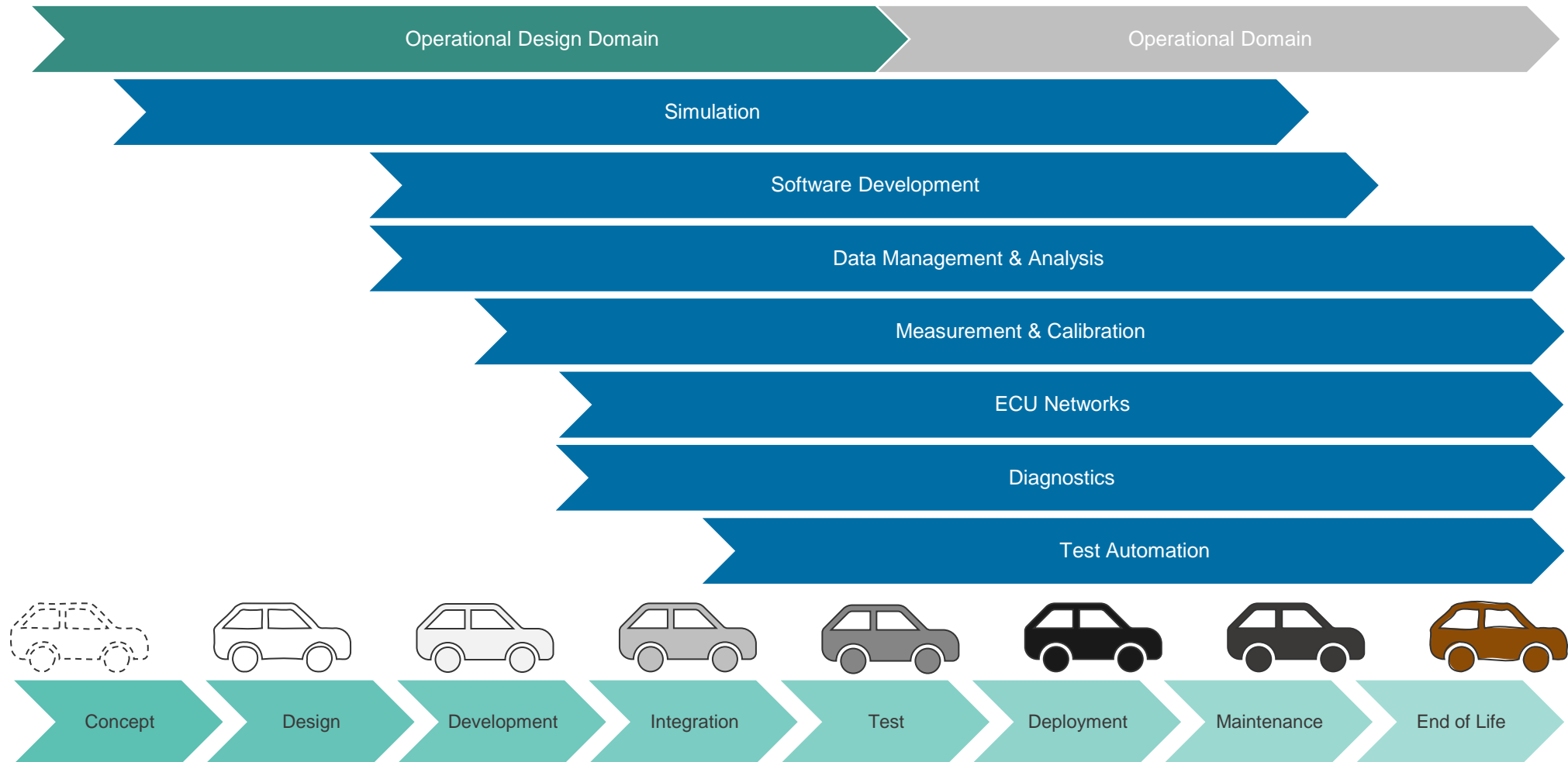
Status: Jul 31, 2023

# Scope

Covering the entire vehicle lifecycle

# ASAM standards

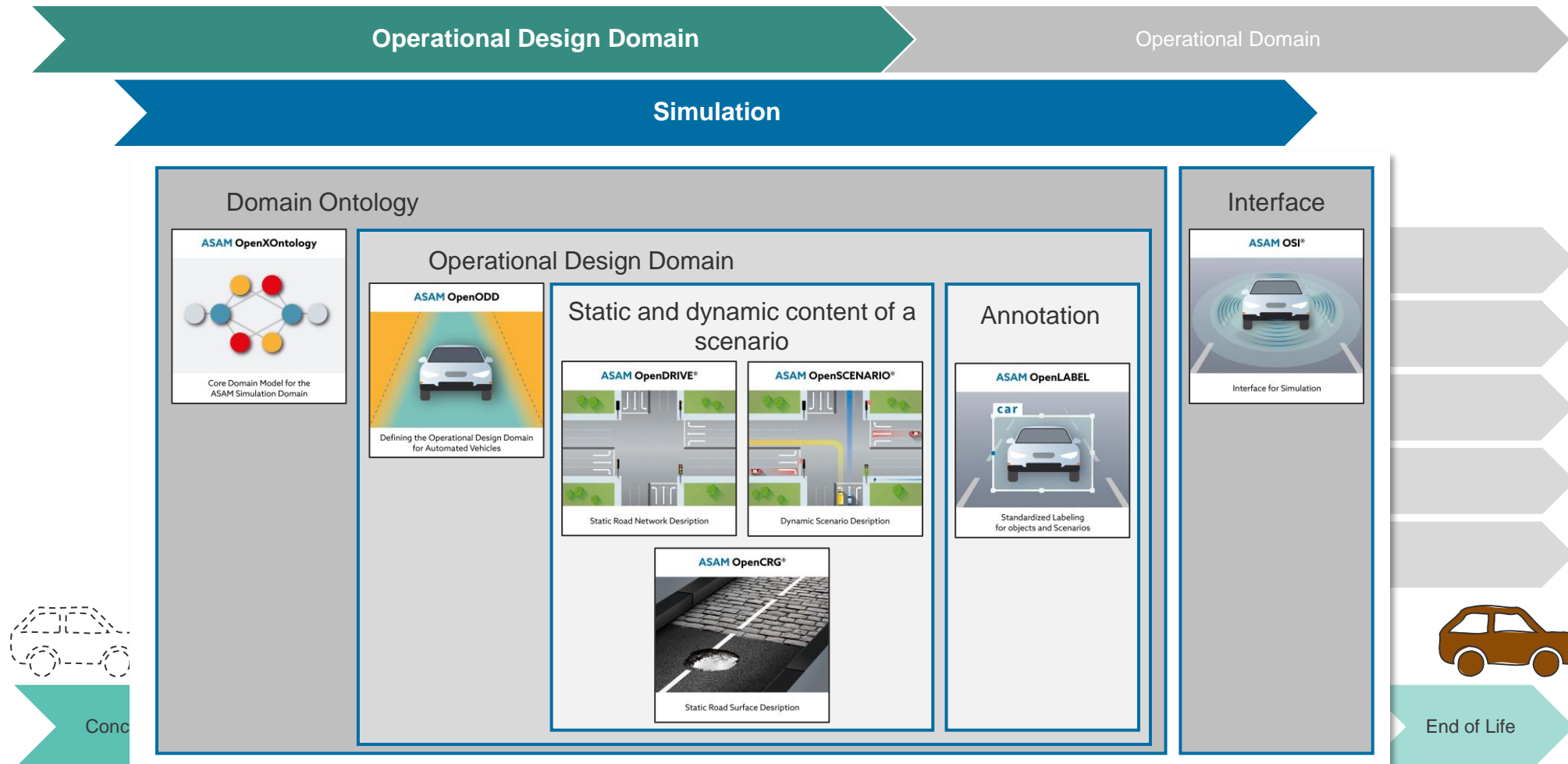
The V-cycle and beyond – covered by ASAM domains





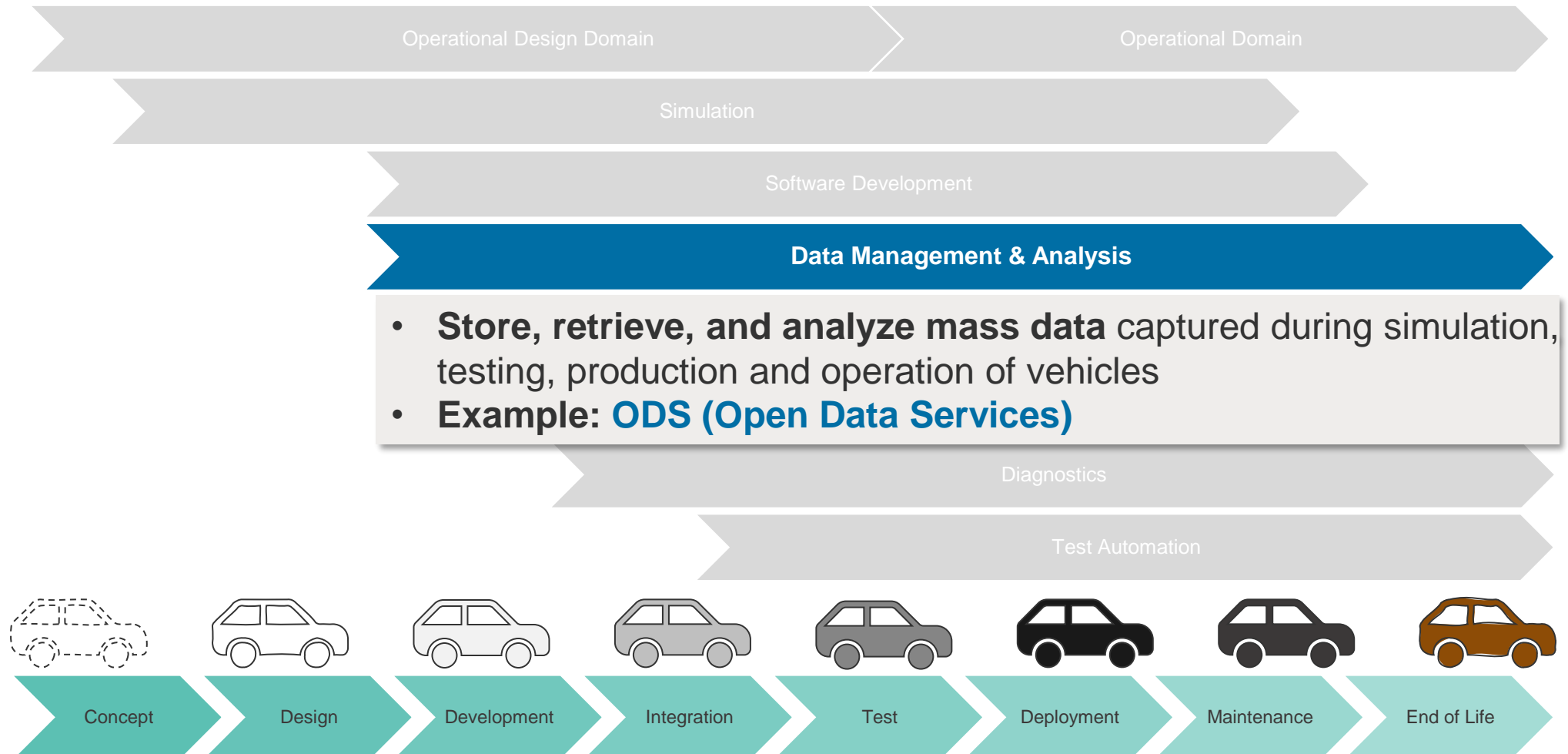
# ASAM standards for ADAS/AD

Domains in Detail



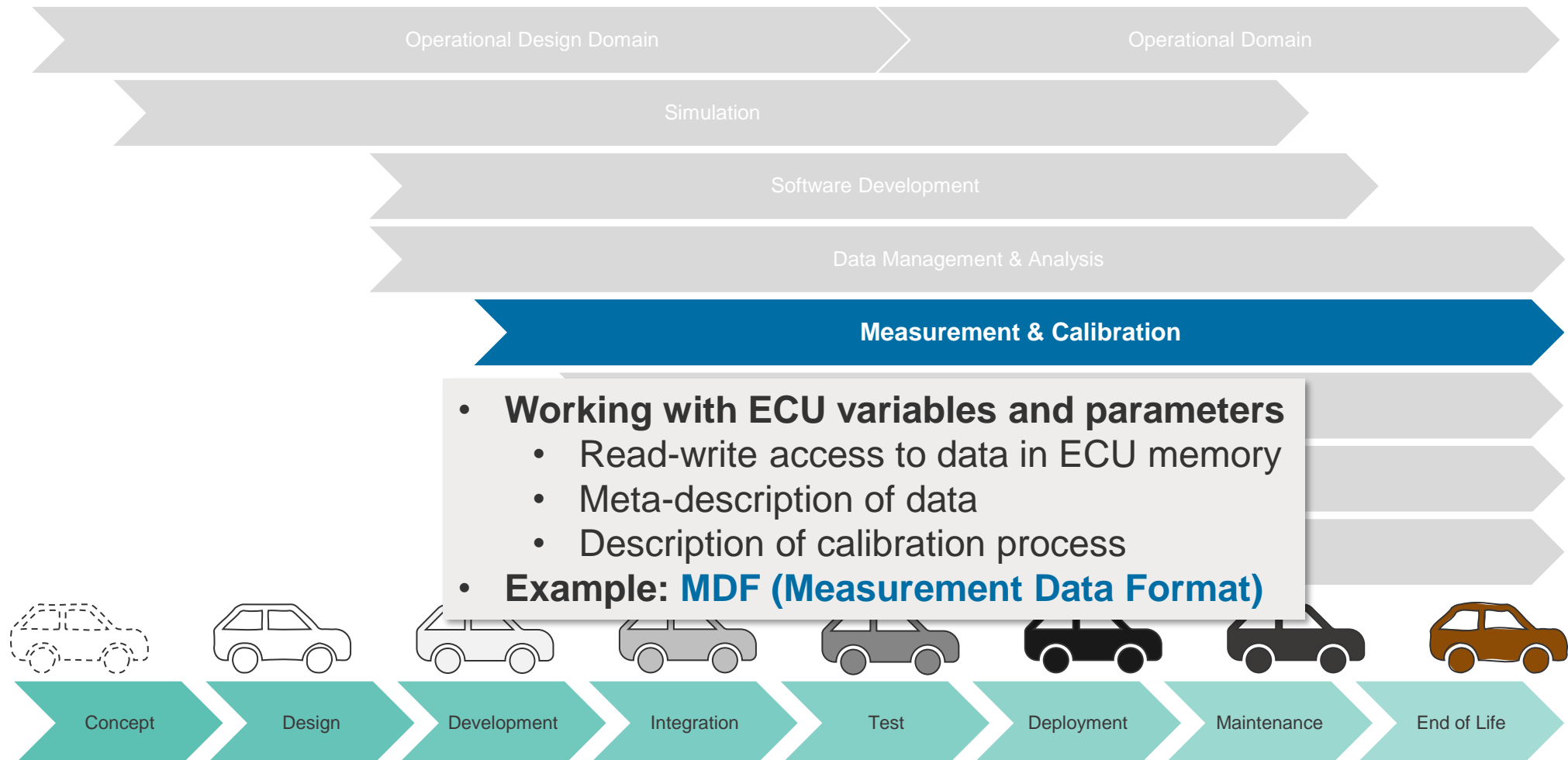
# ASAM standards

Domains in detail



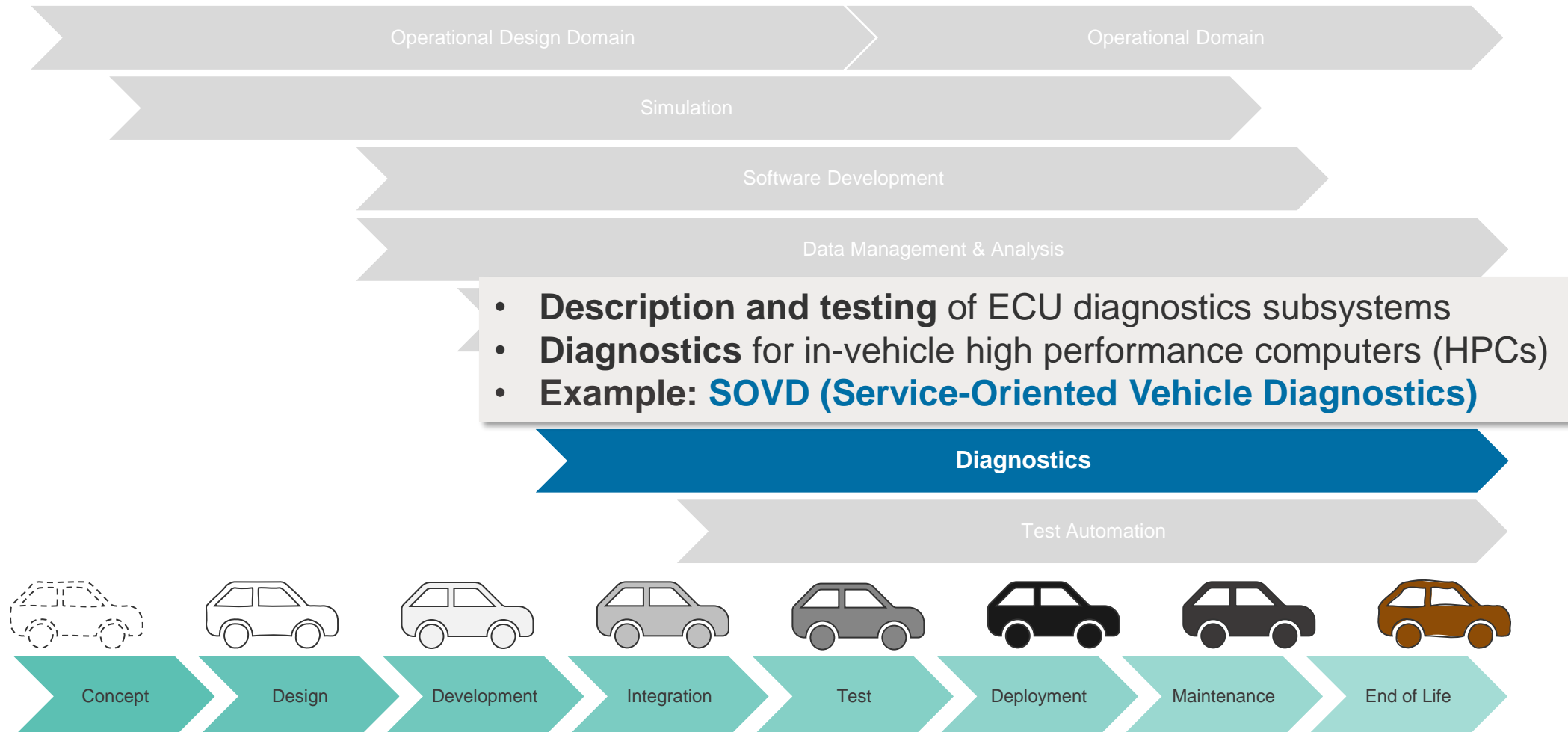
# ASAM standards

Domains in detail



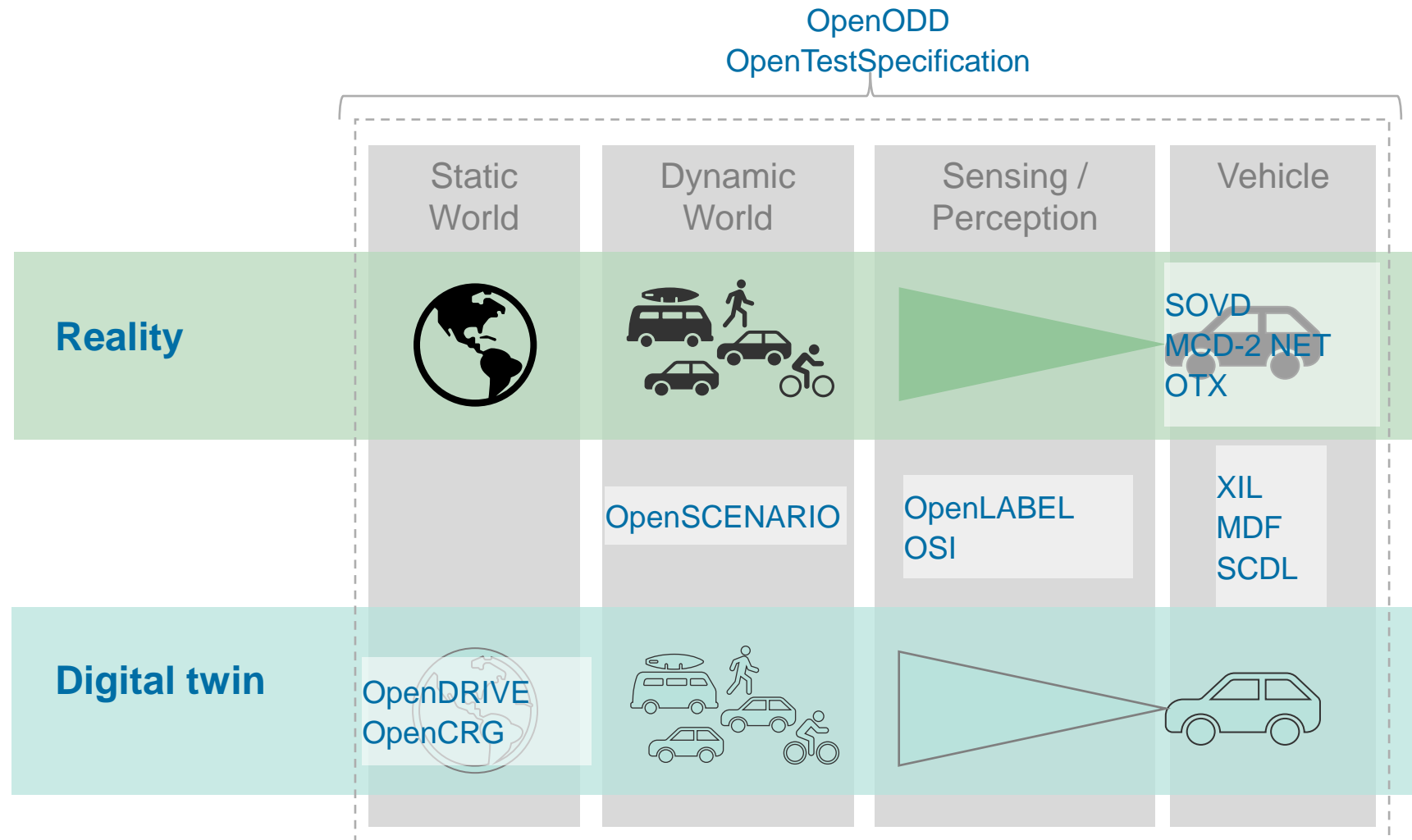
# ASAM standards

Domains in detail



# ASAM's offer

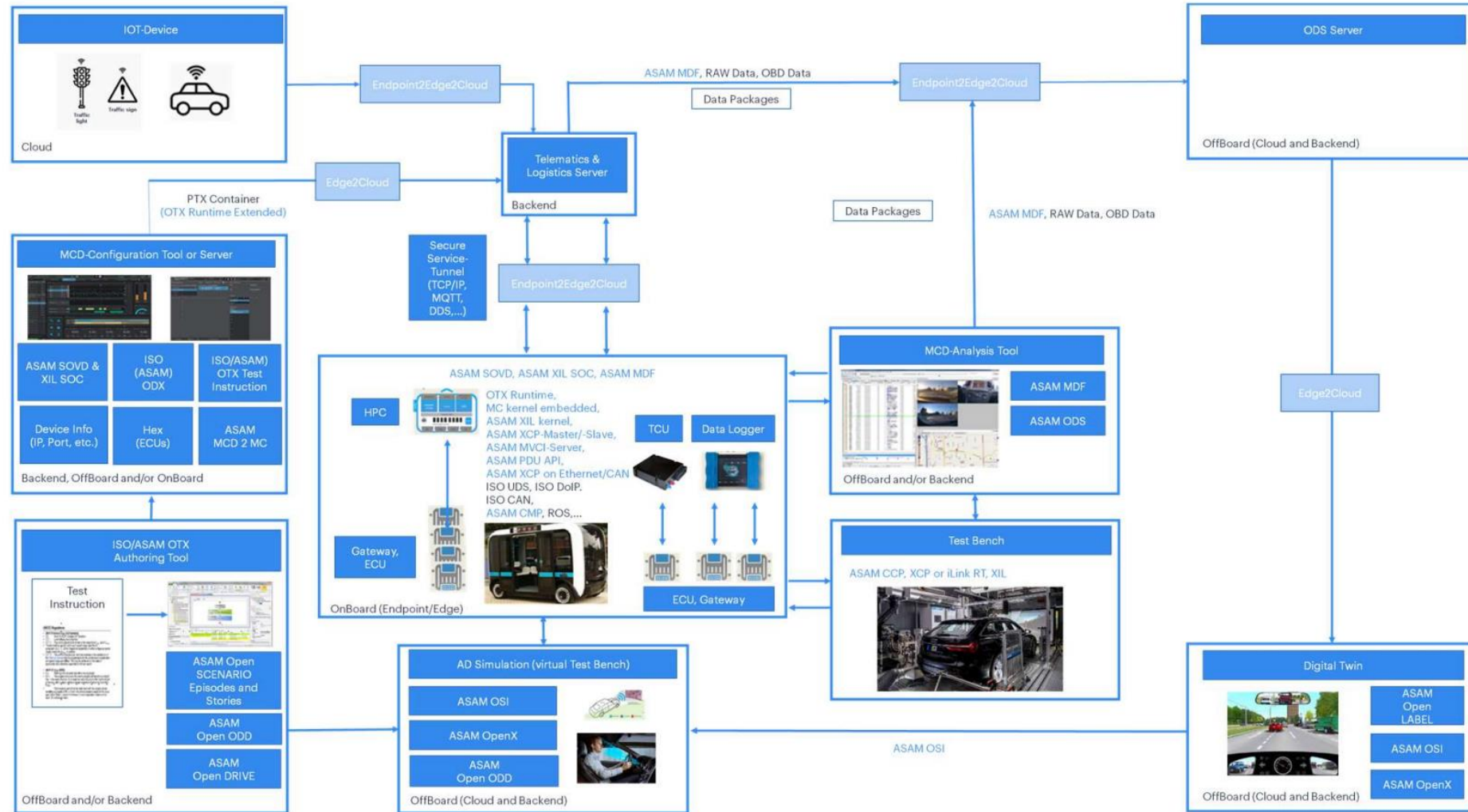
Connecting the real and the virtual world



and many more....

# ASAM's offer

## Development and testing



Source: RAC

# ASAM's offer

Environments and methods: seeing the big picture

TEST METHOD	TEST ENVIRONMENT							
	MODEL- IN-THE-LOOP	SOFTWARE REPROCESSING	CLOSED-LOOP SIL	HARDWARE REPROCESSING DATA REPLAY	CLOSED-LOOP HIL	VEHICLE- IN-THE-LOOP (VIL)	DRIVER- IN-THE-LOOP (DIL)	OPEN ROAD TESTING FIELD MONITORING
<b>REQUIREMENTS- BASED TEST</b> (FUNCTIONAL TEST) <i>Software architectural design/Specified functionality</i>	<u>More details 5.2.2</u> Requirements-based testing MIL +	Test of ADAS/AD software via open loop e.g. detection quality	<u>More details 5.2.1</u> Use cases Requirements-based test SIL +		<u>More details 5.2.1</u> Requirements-based testing on closed-loop HIL +	<u>More details 5.2.7</u> Requirements-based testing vehicle-in-the-loop +		Testing in a controlled proving ground environment e.g. testing of the complete ADAS function in real-world conditions
<b>INTERFACE TEST</b> <i>Software unit implementation/ Hardware - software interface specification</i>			Software integration tests e.g. test of interfaces for communication between ...	<u>More details 5.2.6</u> Hardware reprocessing Data replay +	Higher-level integration tests e.g. testing of bus communication between ECUs	Testing of complete ADAS/AD effect chain on system level e.g. interaction		
<b>FAULT INJECTION</b> <i>Testing of safety mechanism/ Robustness</i>	<u>More details 5.2.3</u> Fault injection on MIL +	Evaluation of robustness e.g. robustness against pixel faults	Verification of safety mechanisms e.g. out of range e.g. testing robustness of software calibration	Verification of safety mechanisms including hardware e.g. testing robustness	Testing of safety mechanisms with integrated system e.g. electrical failure simulation like short to ground e.g. testing of robustness against vehicle tolerances		Validation of overall system behavior e.g. testing of controllability	Verification of overall system performance e.g. testing of safety
<b>RESOURCE USAGE PERFORMANCE TEST</b> <i>Sufficiency of resources/ Hardware architectural design</i>					Testing of the vehicle network performance e.g. sleep and wake			
<b>SCENARIO-BASED TEST</b> <i>Validation of real-life use cases/SOTIF validation</i>	Validation of control components e.g. testing of ADAS/AD effect chain in modeling environment		<u>More details 5.2.8</u> Scenario-based testing SIL Closed loop +		Validation of electronics integration e.g. testing the overall system behavior in challenging scenarios	Validation on system level e.g. complete system reaction to the most challenging scenarios	Validate interaction of driver with safety- relevant vehicle function (HMI, ADAS, active chassis systems), confirm controllability classifications from hazard analysis and risk assessment	<u>More details 5.2.5</u> Scenario-based testing on proving grounds +
								<u>More details 5.2.4</u> Scenario-based open road testing +

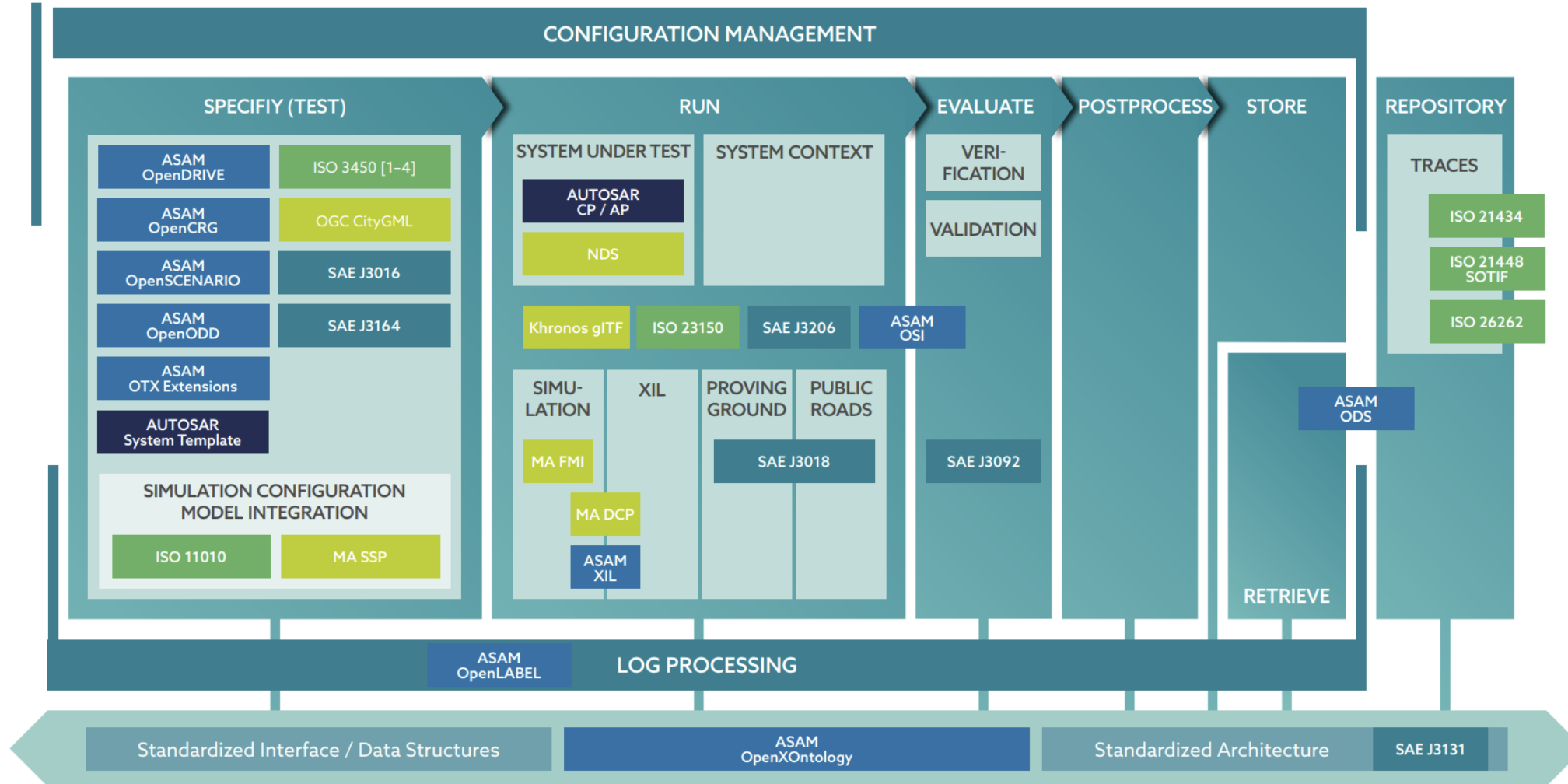


<https://www.asam.net/standards/asam-test-specification/>

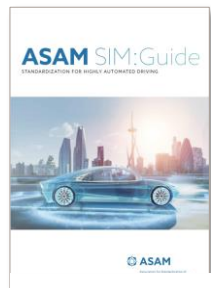


# The landscape of (open) standards in ADAS/AD testing

Abstract architecture of a simulation environment



Source:

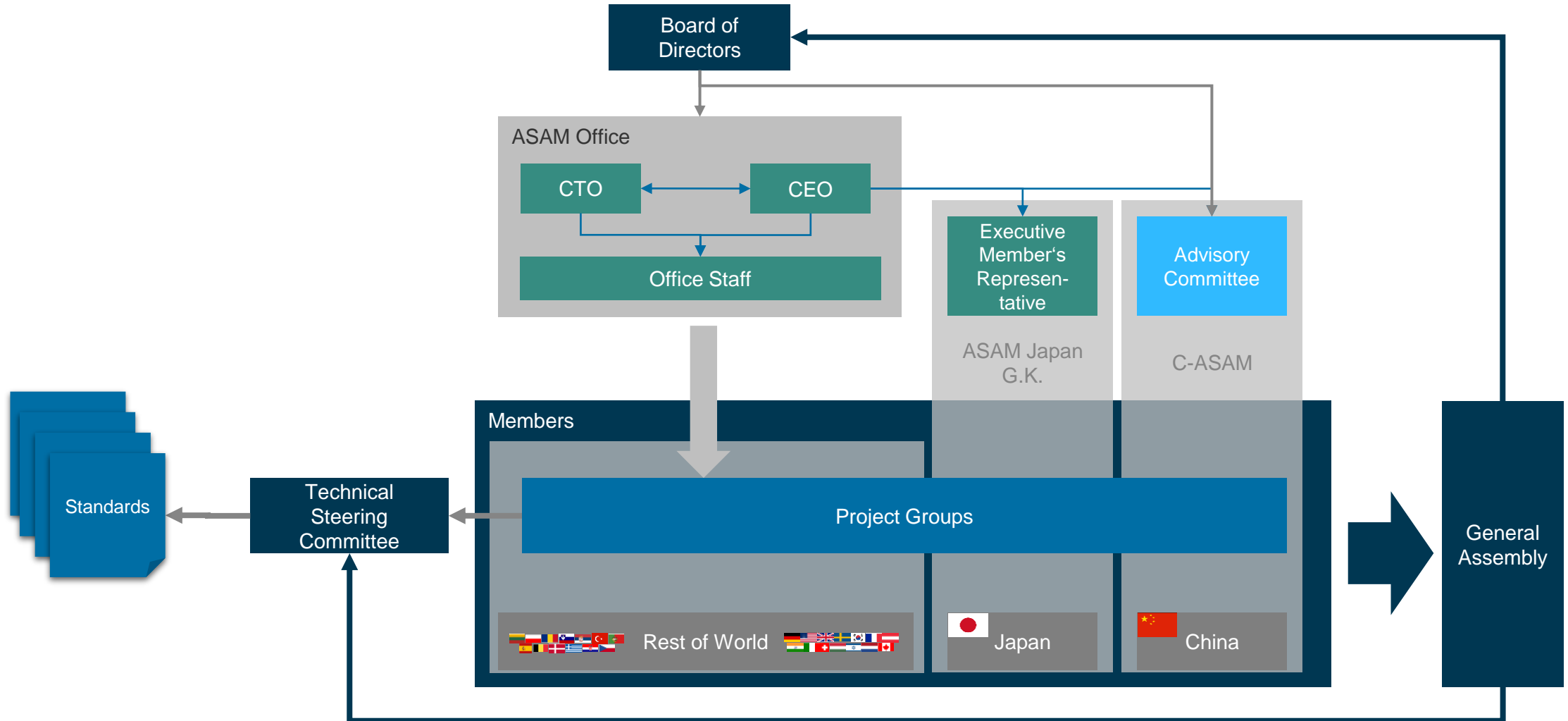




# Office and Organization

# ASAM Organization

Shared Responsibilities – Combined Forces



# ASAM Board of directors 2023-2025

Leading the association



Dr.  
**René Grosspietsch**  
BMW AG  
[Profile](#)



Dr.  
**Andras Kemeny**  
Driving Simulation  
Association  
[Profile](#)



Dr.  
**Ralf Nörenberg**  
HighQSoft GmbH  
[Profile](#)



Prof. Dr.  
**Frank Köster**  
DLR  
[Profile](#)

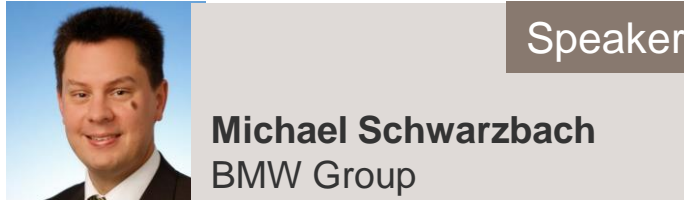
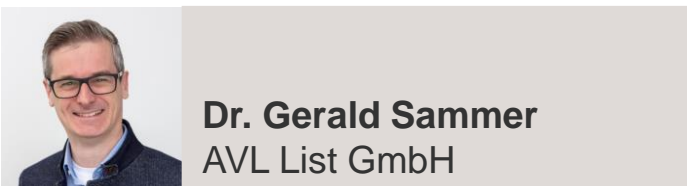
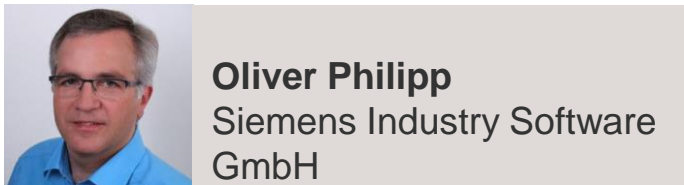
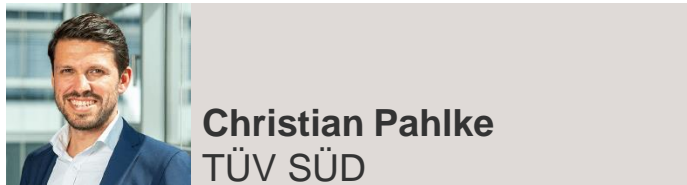
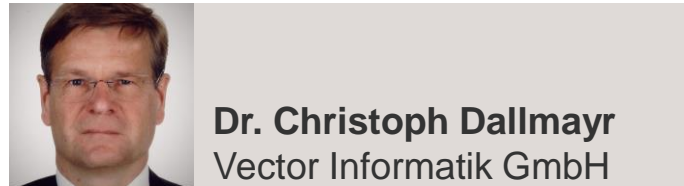
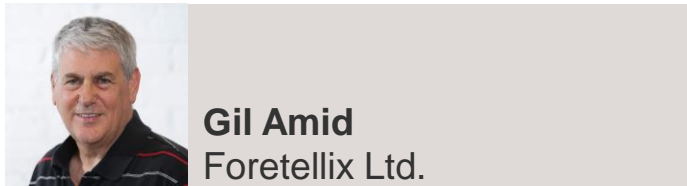


**Armin Rupalla**  
RA Consulting GmbH  
[Profile](#)

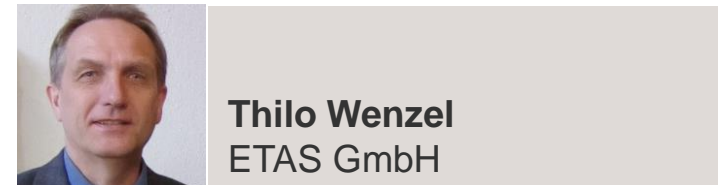
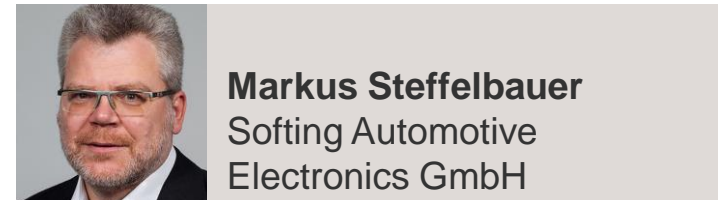
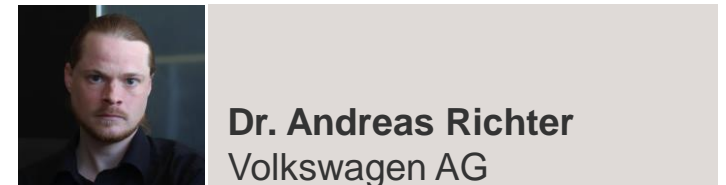
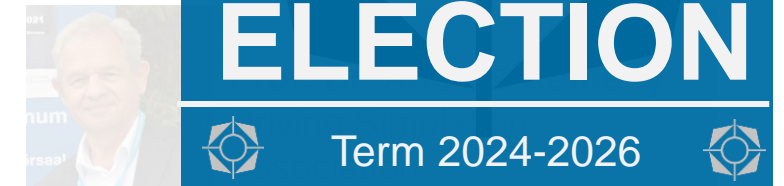
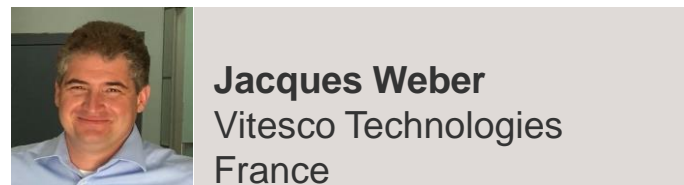
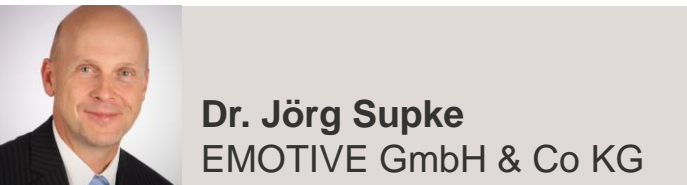
Speaker

# Technical Steering Committee – Term 2022 - 2024

Leading the standardization

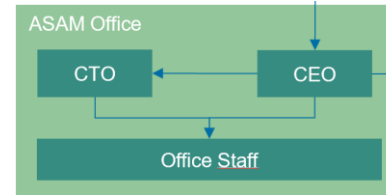


Speaker



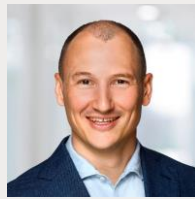
# ASAM Office 2023

The ASAM team “at your disposal” – at any time



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**Dorothee Bassermann**

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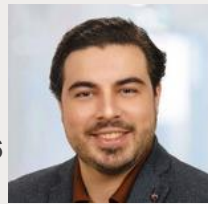
**Thomas Matthes**

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## ASAM Japan G.K.



**Yoshiaki Shoi**

Representative in Japan  
Phone: +81 (0)3-6721-8503  
yoshiaki.shoi@asam.net



**NN 1**

Technology Manager  
(from Nov 1<sup>st</sup>, 2023)



**NN 2**

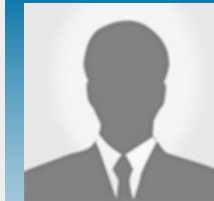
Technology Manager  
(from Nov 1<sup>st</sup>, 2023)



**Mohammed Habib**

Technology Manager  
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mohammed.habib@asam.net

## Extension 2023



**NN**

IT Administrator and  
Software Developer

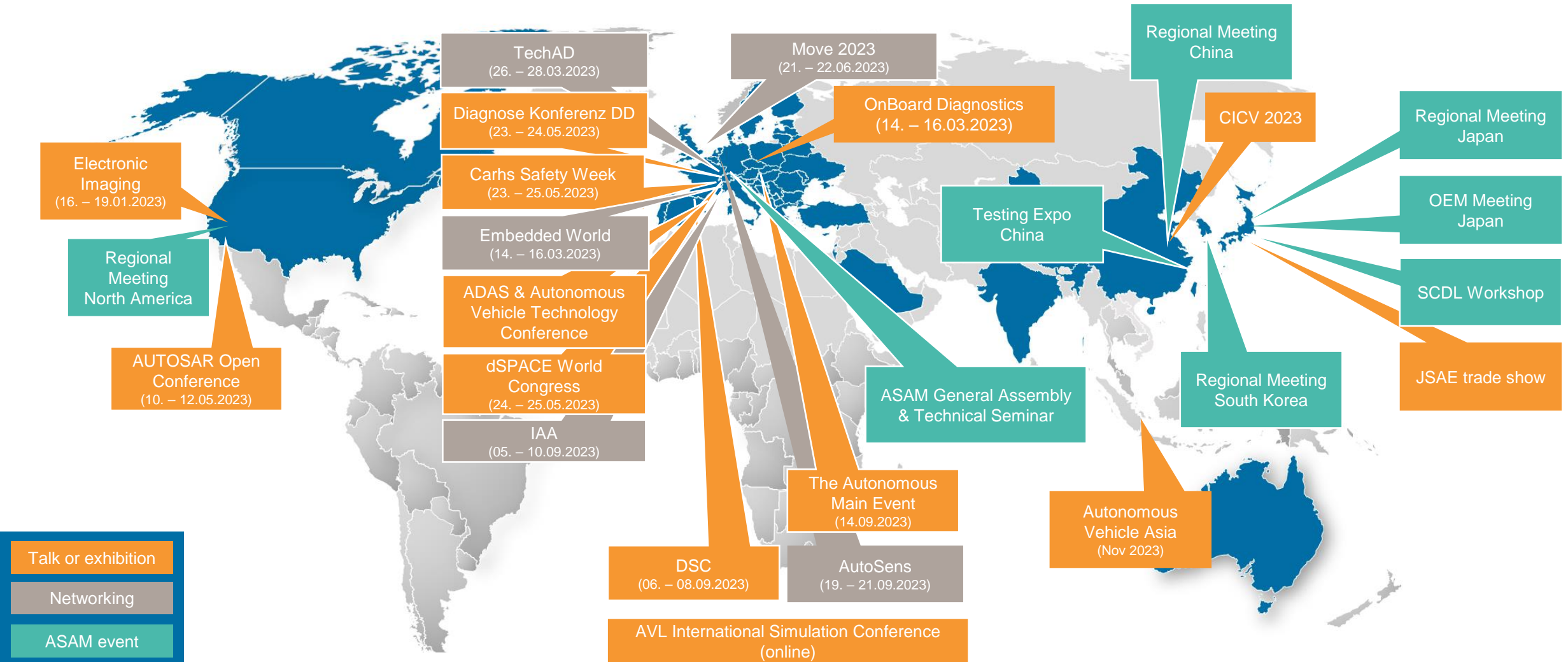


**NN**

Technology Manager

# ASAM – a truly international association

Lobbying for ASAM and its standards worldwide



# Partnerships



# Strategic partnerships



AUTOSAR –  
AUTomotive Open System ARchitecture  
[www.autosar.org](http://www.autosar.org)



Eclipse Foundation  
[www.eclipse.org](http://www.eclipse.org)



IAMTS e.V.  
International Alliance for Mobility Testing and  
Standardization  
[www.iamts.org](http://www.iamts.org)



ISO  
International Organization for Standardization  
[www.iso.org](http://www.iso.org)



MIPI Alliance  
[www.mipi.org](http://www.mipi.org)



Modelica Association / FMI - Functional  
Mock-up Interface  
[www.fmi-standard.org](http://www.fmi-standard.org)



MOST Cooperation  
[www.mostcooperation.com](http://www.mostcooperation.com)



prostep ivip Association  
[www.prostep.org](http://www.prostep.org)



SAE International  
[www.sae.com](http://www.sae.com)



The Autonomous  
[www.the-autonomous.com](http://www.the-autonomous.com)



# Government funded R&D projects



## KisSME

Artificial Intelligence (AI) for the selective near-real-time recording of scenario- and maneuver data during the testing of highly-automated vehicles

- Funded project, Germany
- Duration:
- <http://www.kissme-projekt.de/>



## RDV - Real Driving Validation

Extension of the verifiability of continuous SW Integration in communication with vehicles in the field

- Funded project, Germany
- Duration
- [www.eclipse.org](http://www.eclipse.org)



## Set Level

SET Level creates an environment for simulation-based testing and development of automated driving functions (simulation platform).

- Funded project, Germany
- Duration: 2019 - 2022
- <https://setlevel.de/>



## SIP-adus

(Strategic Innovation Program - Innovation of Automated Driving for Universal Service)  
Implementation of cooperative automated driving.

- Funded project, Japan
- Duration: 2014 - 2023
- <https://en.sip-adus.go.jp/>



## TreuMoDa

(Trust Office for Mobility Data)

Guidelines for the data protection-compliant exchange, processing and storage of data.

- Funded project, Germany
- Duration: 2022 – 2024
- <https://www.treumoda.de/>



## AVEAS

(Absicherungsrelevante Verkehrssituationen Erheben, Analysieren, Simulieren)

Detect critical real-world situations and transfer them into models for scenario generation and simulation.

- Funded project, Germany
- Duration: 2021 – 2024
- <https://www.aveas.open-set.org/>

# Government funded R&D projects

ASAM acting on the advisory board



**Sunrise** - (Safety assurance framework for connected, automated mobility Systems)  
PL: IDIADA (H2020 project)  
The project will define, implement and demonstrate the building blocks of this Safety Assurance Framework: harmonized and scalable safety assessment methodologies, procedures and metrics tailored for use cases, a federated European Scenario Database framework and its necessary data interfaces, a commonly agreed simulation framework including tools and interfaces.  
Duration: 2022-2025  
[SUNRISE - ika \(rwth-aachen.de\)](https://www.safecad-vivid.net/)



**VIVID**  
PL: DLR (BMW/VDI)  
In the framework of VIVID, industrial and academic partners work on the design and implementation of a high-fidelity virtual validation tool chain, connecting software-based traffic and sensor simulations with environmental and signal propagation modelling as well as installed sensor performance testing in virtual environments.  
<https://www.safecad-vivid.net/>



## ArchitectECA2030

PL: Infineon (H2020 project)  
ArchitectECA2030 envisions to cover both safety assurance by design and safety assurance in-operation.

- Manage failure modes, uncertainties, and failure probabilities
- Develop a widely agreed homologation framework
- Propose, align and develop a concept
- Bring together the representative stakeholders from ECS industry

<https://autoc3rt.automotive.oth-aw.de/>

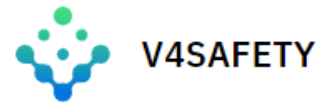


## GAMMS

PL: GEOSAT (H2020 project)  
The overall objective of GAMMS is to develop an autonomous terrestrial mobile mapping system (AMMS), based on the tight integration of

- Autonomous vehicles (AVs)
- Navigation/geodetics
- Artificial Intelligence (AI) technologies.

<https://gamms.eu/index.php/robots-mapping-for-robots/>



## V4Safety

PL: TNO (H2020 project)  
The main objective of V4SAFETY is to provide a comprehensive procedure for conducting computer simulations to determine the long-term performance and impact of road safety solutions, from the identification and collection of the relevant input data to the projection of the results to a region of interest (e.g., the EU) and a prediction of changes in performance and impact that might be expected in the coming years.  
[V4SAFETY \(v4safetyproject.eu\)](https://v4safetyproject.eu/)

# ASAM membership

Great value for a moderate investment

# The value

Why join ASAM?



## Speed

- Ideation at any time
- **12-18 months from idea to standard**
- Committee meetings every 4 months



## Coverage

- **Standards across the entire vehicle lifecycle**
- Standards for real world and digital twin
- Cutting-edge technologies addressed
  - Simulation
  - HPCs in the vehicle
- Unmatched coverage of the simulation domain



## Focus

- **Focus on implementation standards**
- Regular scan of technology landscape



## Assets

- 37 released and regularly updated standards
- 7 domains
- **Free access to all assets for active members**



## Community

- **420+ like-minded companies**
- Regional study groups
- Global project groups
- Annual member meeting
- Annual technical seminar
- Up-to-date information by newsletters
- Online Member directory
- Easy networking between members



## Processes

- **Well-established processes**
- Flexibility where necessary
- Permanent monitoring and optimization



## Leadership

- Committees of industry professionals
  - 5 Board members
  - 12 TSC members



## Activity

- 9 releases in 2022
- **396 participants in technical meetings from 202 companies**
- 7 active standardization projects
- 1 concept project
- 1 ideation topic
- 2 study groups
- 1 alignment project



## Value

- Early access to information
- **Influence on future standards**
- Increased efficiency by standards
- Creation of a competitive market

# Conclusion

Why ASAM?

# Conclusion

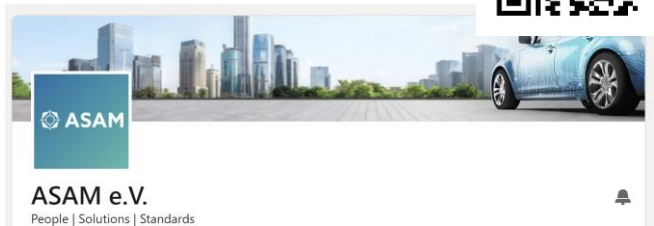


There is no standard answer

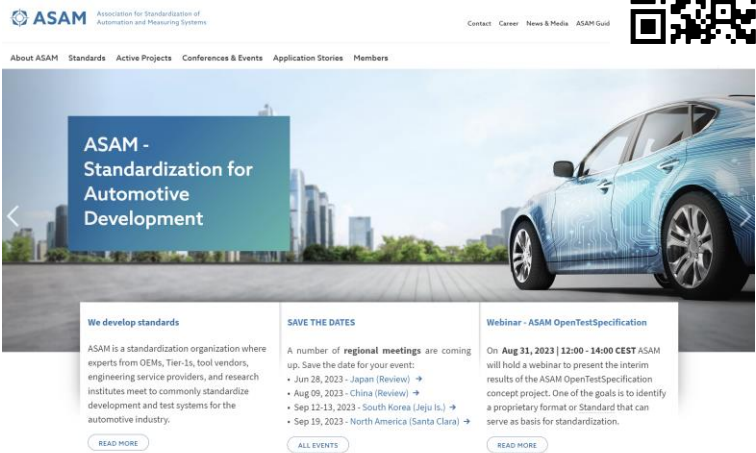
but **standards are key to the answer** – today and tomorrow!

# More information about and from ASAM

## LinkedIn



## Website



## Newsletter



## Publications



## YouTube



ASAM e.V.  
@asame.v.1133 435 Abonnenten 84 Videos  
ASAM e.V. (Association for Standardization of Automa...  
[asam.net](#) und 1 weiterer Link

## WeChat (C-ASAM)



# Thank you for your attention!

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ASAM e.V.

email: [marius.dupuis@asam.net](mailto:marius.dupuis@asam.net)

