ASAM
2019 / 2020+

Dr. Klaus Estenfeld
Managing Director ASAM e.V.

June 25, 2020
Zoom Meeting

ASAM
Association for Standardization of
Automation and Measuring Systems

ASAM - Introduction
Compliance Statement

For more than 20 years, ASAM e.V. (Association for Standardization of Automation and Measuring Systems) is actively promoting standardization within the Automotive Industry. Together with its more than 300 members worldwide, the association develops standards that define interfaces and data models for tools used for the development and testing of electronic control units (ECUs) and for the validation of the whole vehicle.

ASAM standards are recommendations, they do not have an impact on regulatory framework.

From the beginning, ASAM has requested and encouraged an open exchange among all stakeholders: manufacturers, suppliers, tool vendors and research institutes. Following this ASAM policy, technical experts from ASAM member companies worldwide commonly develop new standards in project groups. The developed standards are accessible for all interested companies and serve as basis for the development of tools and ECUs within the respective companies worldwide. Tools and products developed based on ASAM standards allow easy integration into existing value chains and seamless data exchange.

ASAM project groups do not define products or take any business decisions preventing competition.

Prof. Dr. Marcus Rieker   Dr. Klaus Estenfeld
Chairman of the Board of Directors   Managing Director
                                                           https://www.asam.net/home/about-asam/compliance.html
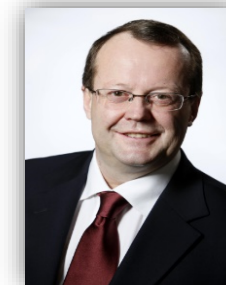
ASAM

ASAM
The Organization

Board of Directors

Voluntary Representatives from International Tier-1s, Tool Vendors and Research Institutes

- Prof. Dr. Frank Köster
  DLR

- Dr. Ralf Nörenberg
  HighQSoft GmbH

- Prof. Dr. Marcus Rieker
  HORIBA Europe GmbH

- Armin Rupalla
  RA Consulting GmbH

- Richard Vreeland
  Cummins Inc.

Technical Steering Committee – Term 2020 - 2022

People Elected for the New ASAM TSC at the ASAM General Assembly 2020

Gil Amid
Foretellix Ltd.

Prof. Dr. Andras Kemeny
Driving Simulation
Association

Kilian Schnellbacher
ETAS GmbH

Nicola Croce
Deepen AI

Oliver Philipp
Siemens Industry Software
GmbH

Michael Schwarzbach
BMW Group

Dr. Christoph Dallmayr
Vector Informatik GmbH

Stefan Romainczyk
National Instruments

Markus Steffelbauer
Softing Automotive
Electronics GmbH

Armin Graf
Vitesco Technologies
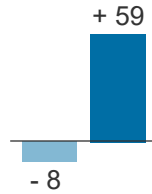GmbH

Dr. Gerald Sammer
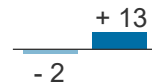AVL List GmbH

Dr. Jörg Supke
EMOTIVE GmbH & Co KG

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New ASAM Members

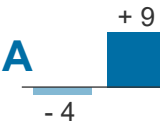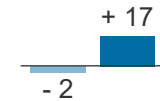109 new ASAM Members since January 2019, thereof 75 New Members in 2019!

EUROPE

+ 59
- 8

AAI AUTOMOTIVE ARTIFICIAL INTELLIGENCE · AB dynamics · ACONEXT · ALIARO · AIMOTIVE · AMIQ · ANNECY ELECTRONIQUE · ARRIVAL · auto.com · BTC embedded systems

CTU · cruden · CVC⁹ Computer Vision Center · DSA · DLR · e.GO · esi get it right® · FDTech · FIVE AI · Fraunhofer IESE

Fraunhofer IVI · Fraunhofer LBF · GEMS · CLIWA · GOD IT SOURCING · GRYFTEC Embedded Systems · kontrol · K-S · IFR · itemis

INCHRON THINK REAL-TIME · IP Camp · innofash · karakun · LATENT LOGIC · LiangDao · luxoft A DXC Technology Company · MARQUARDT · MP COOLING

Mindmotiv · NTT DATA · Parkopedia · parson we create knowledge · PROBTEP · PTB Physikalisch-Technische Bundesanstalt · Quint Safety

SMART TESTSOLUTIONS · speedgoat · STRONG⁺ · thyssenkrupp · TÜV SÜD Auto Service · TRUCKHELP · uman Time Sensitive Networks

unity · UNIQUE SEC UniqueSec · vti · WMG THE UNIVERSITY OF WARWICK · vicomtech · zuragon

Rest of ASIA

+ 9
- 4

HYUNDAI AUTRON · cognata · GIT Global Information Technology · JOONGBU UNIVERSITY

· SMART DESIGN CORP. ·

TENERGY · Vayavya Labs

CHINA

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51 WORLD · 数据资源中心 · ·

中国汽研 CAERI · DJI · HUAWEI · LANDTOP

NAVINFO · SAIMO · Tencent 腾讯 · sapa

· · VETC ·

JAPAN

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ADVICS · Communication Arts Technology Systems · ChangeVision · e-SYNC

HITACHI Inspire the Next Hitachi Automotive Systems · MAZDA · MITSUBISHI PRECISION CO.,LTD. · Symphony

Ubiquitous AI Corporation · YOKOGAWA Yokogawa Test & Measurement · KANAGAWA INSTITUTE OF TECHNOLOGY

NORTH AMERICA

+ 13
- 2

ALPHA DRIVE · Applied Intuition · deepen · EDGE CASE RESEARCH · Mechanical Simulation carsim trucksim bikesim

NVIDIA · sibros · M STATE · TRC Transportation Research Center Inc. ·

Uber ATG · · MECALC
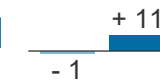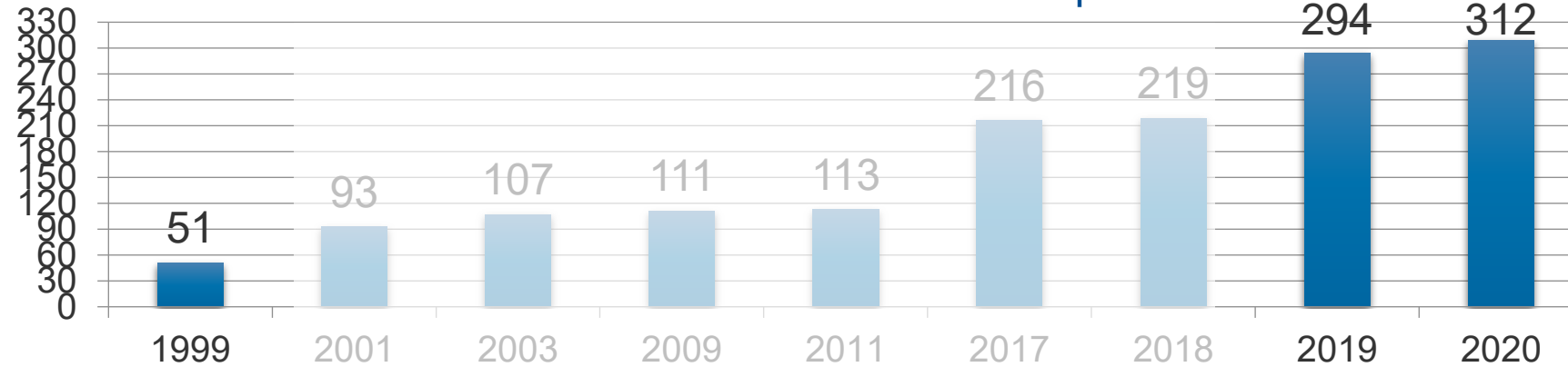
Status: as of June 24, 2020

ASAM

Membership Development

New Members: 220% Growth Rate in 2019!

Total Number of Members per Year

Entries vs. Resignations/Write-Offs

Entries ■ Resignations & Consolidations

Status: as of June 24, 2020

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ASAM Membership

More Than 300 Member Organizations Develop and Apply ASAM Standards

OEMs

Tier-1 Suppliers

Tool Vendors / Service Providers

Universities / Research Institutes

Japanese ASAM Members

Currently 42 Members – 6 more since Regional Meeting Japan 2019

- **OEMs**

- **Tier-1 Suppliers**

- **Tool Vendors**

- **Academics**

Status June 24, 2020

Some Highlights

ASAM actively drives its evolution – inside and outside

- New Standards Related Activities
  - New domain "Simulation" established, high interest worldwide
  - Five ASAM OpenX projects identified in Jan. 2019, first releases in March 2020
  - First successful local Concept Project outside Europe finished
  - First standard development outside Europe, released in May 2020

- Next Steps towards Internationalization
  - Local entry in China (C-ASAM)
  - Re-vitalization of North American Activities
  - Requests from Korea to set up a local ASAM community
  - First ASAM members in Canada, Croatia, Israel, Romania, Slovenia, Spain, Ukraine….

- Services for ASAM members worldwide (members in 28 countries)
  ASAM International Conference 2019, ASAM General Assembly 2020, …

- A Recognized Partner in the Standardization Community
  Liaison Agreements with ISO, MoU with SAE, AUTOSAR Attendee Agreement, …

ASAM International Conference 2019 – Dresden, Dec. 10-11, 2019

„Standardized Virtual Development as a Key to Future Mobility"

Attendees (n=296)

71 %

29 %

Germany   International

RoW

3

7

9

17

21

EUR

27

Number of Attendees
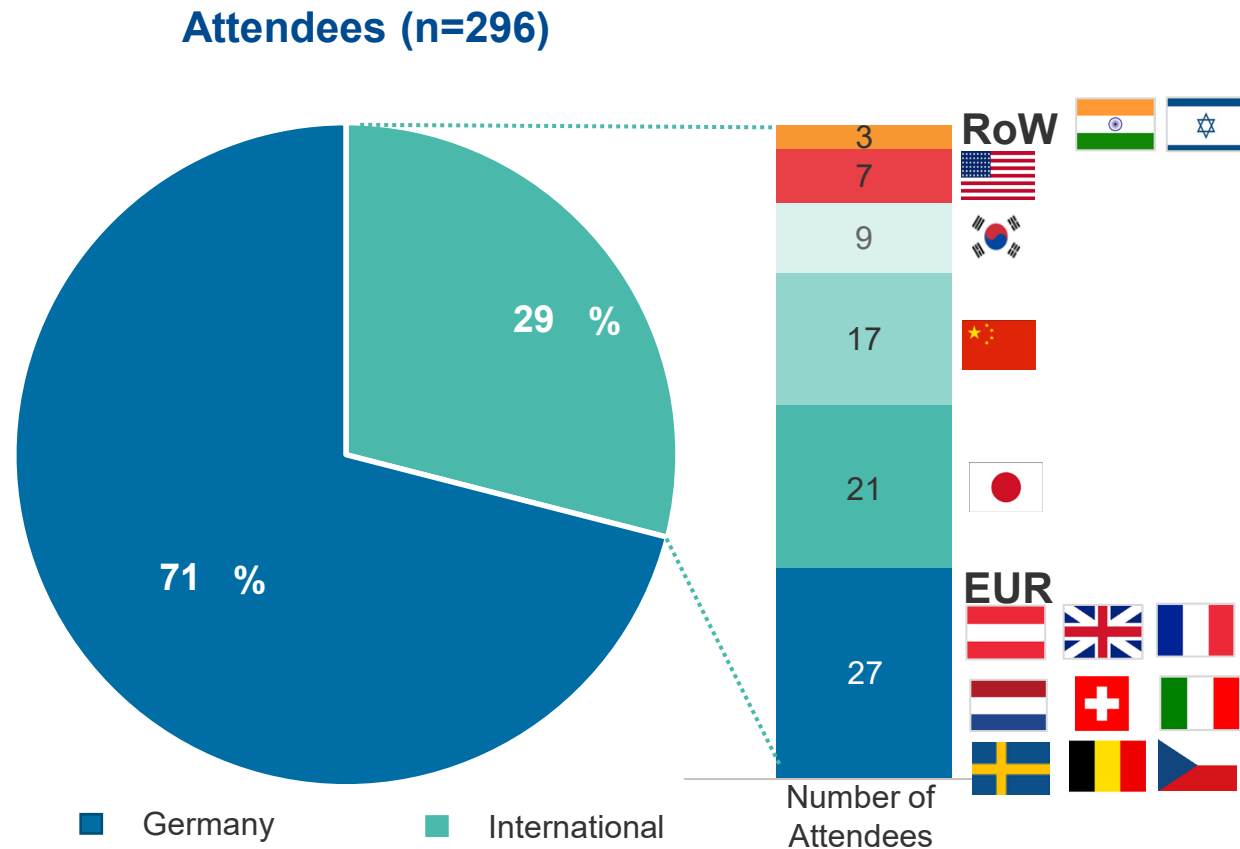
Interntationalization of ASAM
Japan, USA, China

ASAM in Japan

In the Driver Seat for International Standard Development Activities

ASAM Hex File Management 1.0.0
- First ASAM Standard completely developed outside of Europe (project lead: Honda)

ASAM SCDL 1.0.0 (Safety Concept Description Language)
- Proposal Workshop end of January
- Proposal was approved at the TSC meeting in May

Discussions of ASAM MCD-2 MC 1.7.1 extensions

ASAM ODS and ASAM XIL **Study Groups**

Regular meetings of **Motorcycle OEM** group

Regional Meeting Japan 2019 in Tokyo
with more than 120 participants!

ASAM OpenDRIVE **Concept WP4** (International Traffic Signs)
- Driven by a dedicated workgroup in Japan (project lead: Mitsubishi Precision)

ASAM in North America
High Interest in ASAM OpenX Standardization

New members from North America, mainly with **interest in ASAM OpenX** standard development

ASAM OpenX Workshop at Carnegie Mellon University, Pittsburgh (organized by ANSYS)

Two ASAM OpenX related workshops, both in the Detroit area
- August – organized together with Center of Automotive Research (Ohio State University)
- October – parallel to "Automotive Testing Expo"

Regional Meeting North America 2019 in Detroit
- Information on ASAM activities
- Start of strategic discussion on how to proceed in North America

Discussion how to intensify the **Collaboration with SAE**
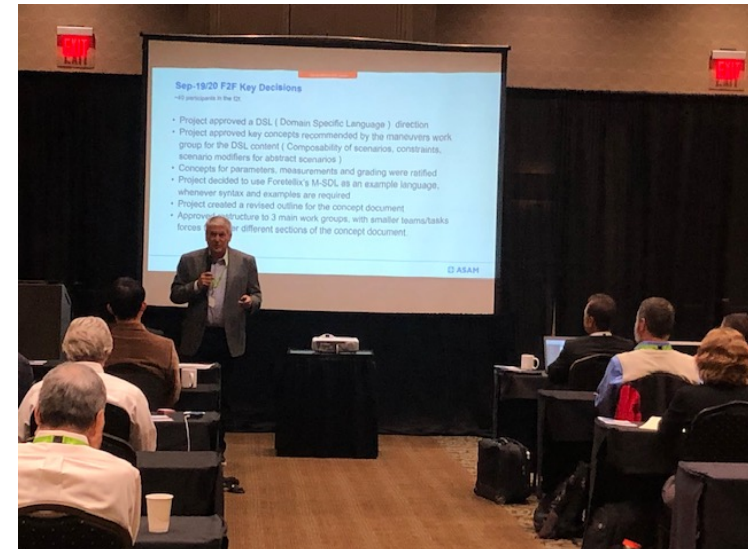
C-ASAM

A Common Initiative between Automotive Data of China (Tianjin) Co., Ltd. and ASAM e.V.

Tasks of the C-ASAM Working Group:

- Promote interest in ASAM and its standards within the local automotive industry
- Accompany local companies in the use of ASAM standards
- Hold trainings on ASAM standards
- Drive the acquisition and integration of Chinese ASAM members
- Start local and international development of ASAM standards in China

Welcome to join ASAM in China via C-ASAM!

Inaugural Ceremony, Chengdu, Sept. 27, 2019

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Standardization at ASAM
Portfolio, Roadmap

ASAM

ASAM Standards Portfolio

Currently seven Domains (Status May 2020)

Simulation

| OpenDRIVE | OpenSCENARIO |

Data Management & Analysis

| CEA | ODS |

Test Automation

| ACI | ASAP 3 | ATX | GDI | iLinkRT |
| MCD-3 MC | XIL | OTX Extensions |

Measurement & Calibration

MCD-1 POD	MCD-1 CCP / XCP
MCD-2 MC	MCD-2 CERP	MDF
ARTI	CDF	CPX	HMS

Diagnostics

| MCD-2 D | MCD-3 D |

ECU Networks

| MCD-2 NET |

Software Development

| CC | FSX | ISSUE | LXF | MBFS | MDX |

ASAM

Release and Project Roadmap for 2019

A First OpenX Standards under Development

2019

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Releases

- ASAM ASAP-3 3.0.0
- ASAM iLinkRT 2.0.0

- ASAM MDF 4.2.0

Project Starts

- OpenDRIVE Transfer
- OpenDRIVE Concept
- OpenSCENARIO Transfer

- ASAM SOVD

- ASAM OpenCRG

- ASAM OTX Extension/ Core Rework

- OpenSCENARIO Concept

- ASAM Runtime Interface (ARTI)

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Release and Project Roadmap for 2020

First ASAM OpenX Standards Released, New Standard Development Methods, Possibly a New Domain

2020

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Releases

- ASAM ODS 6.1.0
- ASAM XIL 2.2.0
- ASAM OTX Extensions 3.0.0
- ASAM OpenDRIVE 1.6.0
- ASAM OpenSCENARIO 1.0.0
- ASAM Run-Time Interface 1.0.0 (ARTI)

Concept Project
- ASAM OpenSCENARIO Concept

Concept Project
- ASAM OpenDRIVE Concept

- ASAM OpenCRG 1.0.0

Further Release in 2021
- ASAM SOVD 1.0.0

- ASAM iLinkRT 3.0.0

- ASAM HMS 1.0.0

Project Starts*)

- ASAM OpenSCENARIO 1.1.0
- ASAM OpenSCENARIO 2.0.0
- ASAM OpenLABEL
- ASAM OSI
- ASAM OpenDRIVE 1.7.0
- ASAM OpenXOntology
- ASAM OpenODD
- ASAM ODS 6.1.0 Maintenance
- ASAM XIL 3.0.0
- ASAM OTX 3.1.0
- ASAM SCDL

*) Status May 28, 2020, not all projects finally approved

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New Domain at ASAM: Simulation

Simulation

- Standards for simulation model data exchange.

- High demand for standards for new type of simulation: Driving and Traffic Simulation.

- Public specs driven by tool vendors have emerged in recent years.

- **Specs have been transferred to ASAM to:**
  - **Become official standards for the industry**
  - **Be hosted by a neutral professional organization**
  - **Guarantee long-term and professional further development**

- Current projects have been transferred to ASAM:
  - OpenDRIVE
  - OpenCRG
  - OpenSCENARIO
  - Open Simulation Interface (OSI)

- Next standards in development and in ideation …
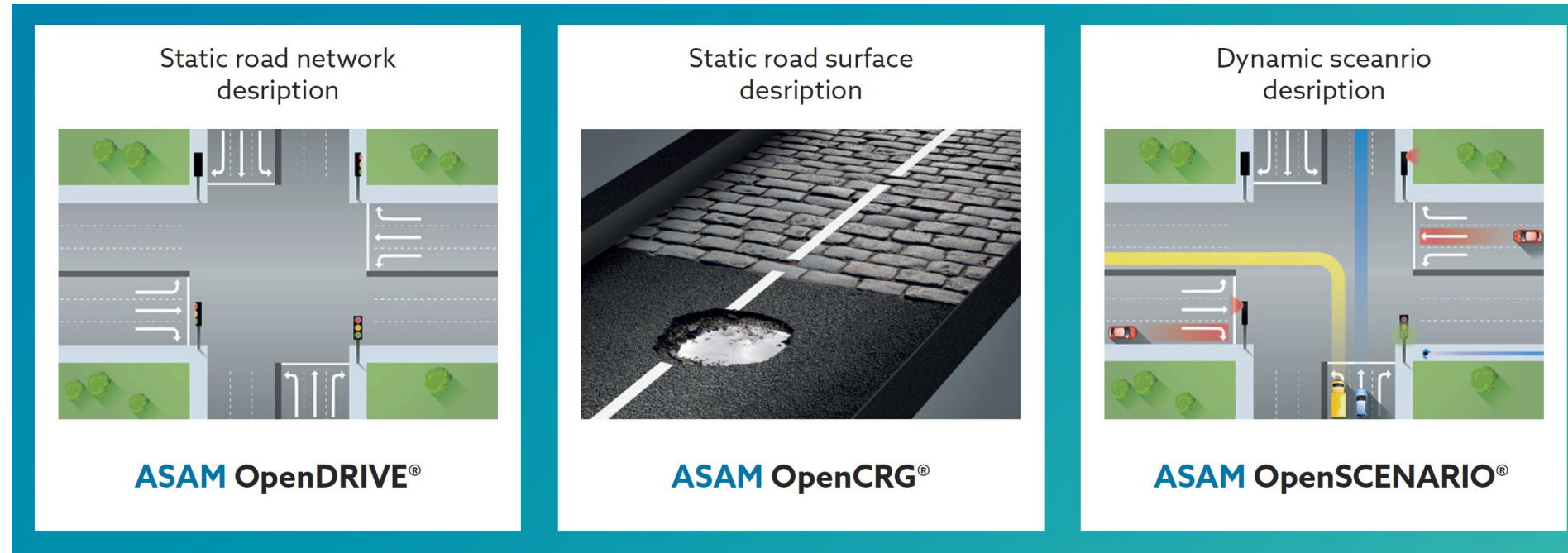
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Transfer of OpenDRIVE® to ASAM

Contract Signed at Driving Simulation Conference 2018, Antibes

Open
Dynamic
Road
Information for
Vehicle
Environment

ASAM

Positioning of ASAM OpenX Standards

The First Three Transferred Standards

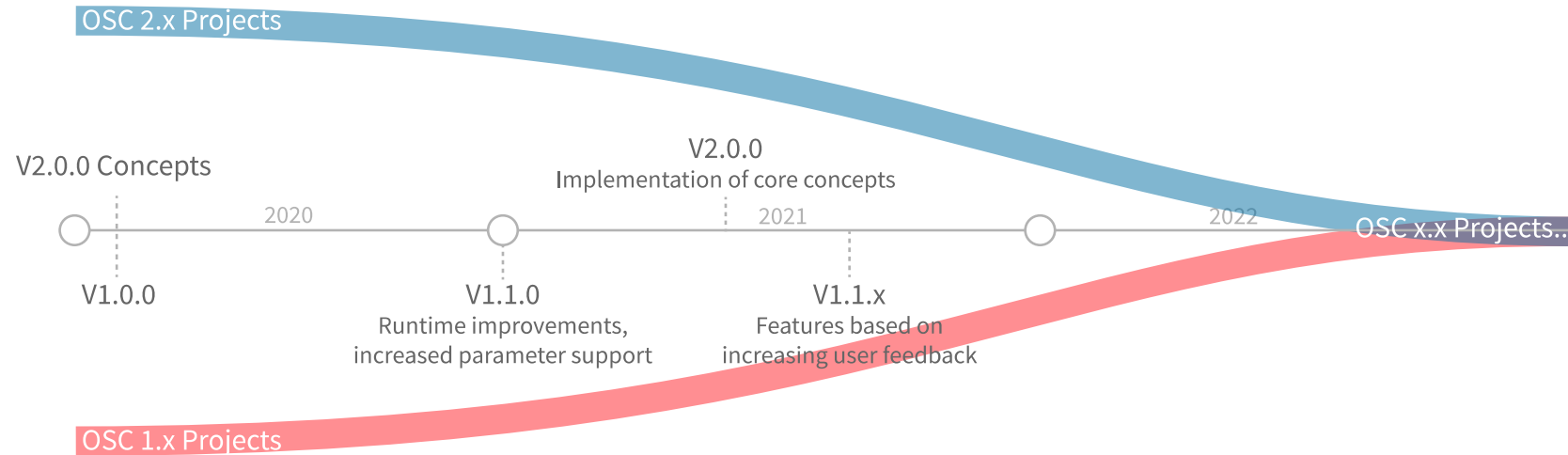| Static road network desription	Static road surface desription	Dynamic sceanrio desription
ASAM OpenDRIVE®	**ASAM OpenCRG**®	**ASAM OpenSCENARIO**®

- **Motivation**
- Exchange of data between creation tools (e.g. road network editors) and simulators.
- Use of the data in simulators from different vendors.
- Use with other public standards.

ASAM

ASAM OpenSCENARIO

Next Steps

OSC 2.x Projects

V2.0.0 Concepts

V2.0.0
Implementation of core concepts

2020   2021   2022

OSC x.x Projects...

V1.0.0

V1.1.0
Runtime improvements,
increased parameter support

V1.1.x
Features based on
increasing user feedback
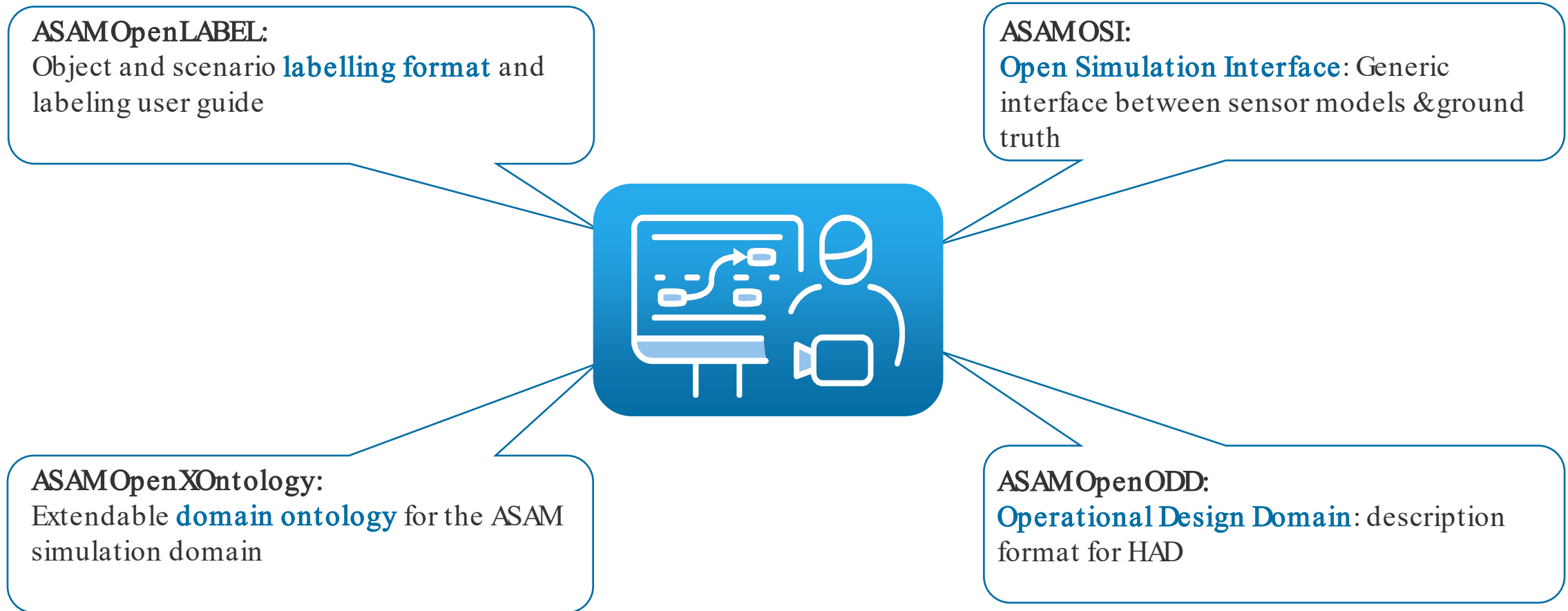
OSC 1.x Projects

Both Projects approved, start June 2020

ASAM OpenSCENARIO 1.x
- Further develop V1.0.0
- More features
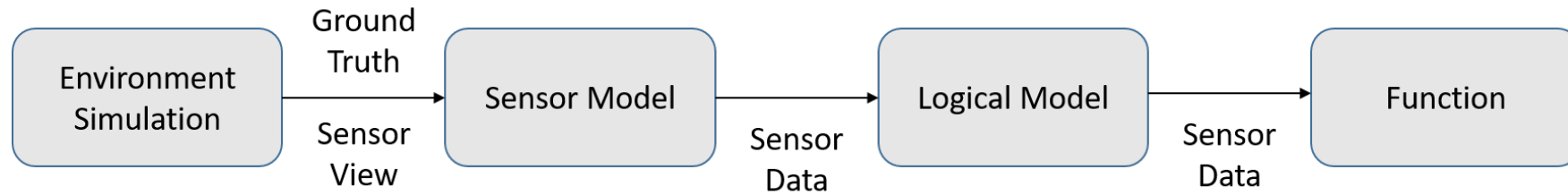- Usability improvements
- More documentation
- Proposal Link

ASAM OpenSCENARIO 2.0
- Develop the concepts from the concept project
- Domain Specific Language (DSL)
- Framework for measurement and success criteria
- Domain Model (UML or Ontology)
- Proposal Link

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New Standardization Initiatives in the Simulation Domain

ASAM OpenLABEL:
Object and scenario labelling format and labeling user guide

ASAM OSI:
Open Simulation Interface: Generic interface between sensor models & ground truth

ASAM OpenXOntology:
Extendable domain ontology for the ASAM simulation domain

ASAM OpenODD:
Operational Design Domain: description format for HAD

ASAM OSI

```
┌──────────────┐  Ground  ┌──────────────┐          ┌──────────────┐          ┌──────────────┐
│              │  Truth   │              │          │              │          │              │
│ Environment  │─────────▶│ Sensor Model │─────────▶│ Logical Model│─────────▶│   Function   │
│ Simulation   │  Sensor  │              │  Sensor  │              │  Sensor  │              │
│              │  View    │              │  Data    │              │  Data    │              │
└──────────────┘          └──────────────┘          └──────────────┘          └──────────────┘
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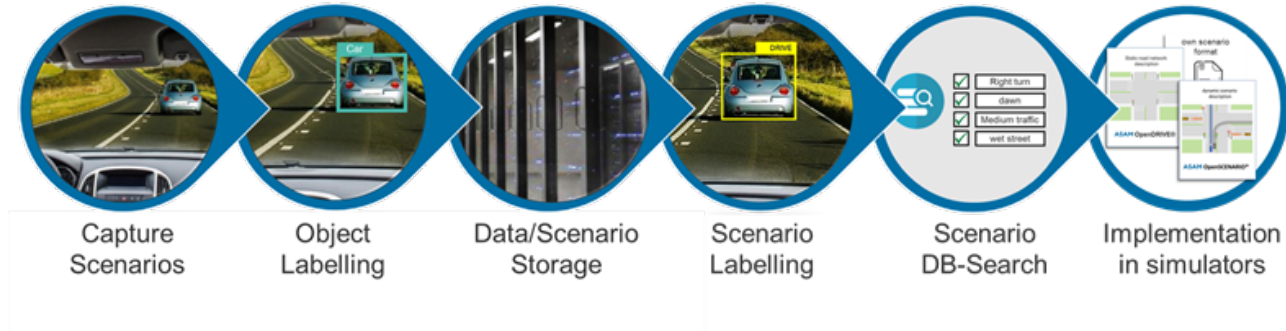
- Proposal approved, start June 2020

- Open source development (contributions from non-members allowed)

- 4 Working Groups:
  1. Physical sensor modeling
  2. Representation of traffic participants & infrastructure
  3. Harmonization with ASAM OpenX standards
  4. Performance & packaging

- Proposal Link

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ASAM OpenLABEL

Life of the recorded data

| Capture Scenarios | Object Labelling | Data/Scenario Storage | Scenario Labelling | Scenario DB-Search | Implementation in simulators |

- Concept Project started April 2020 (6 months duration)

- > 40 companies participating

- Focus on the HOW to label
  → Provide labeling formats that can be linked to e.g. an ontology for the WHAT

- Allow for labels of objects of interest & scenarios

- 2 deliverables:
  - Concept paper for OpenLABEL
  - List of requirements for the ASAM OpenXOntology project
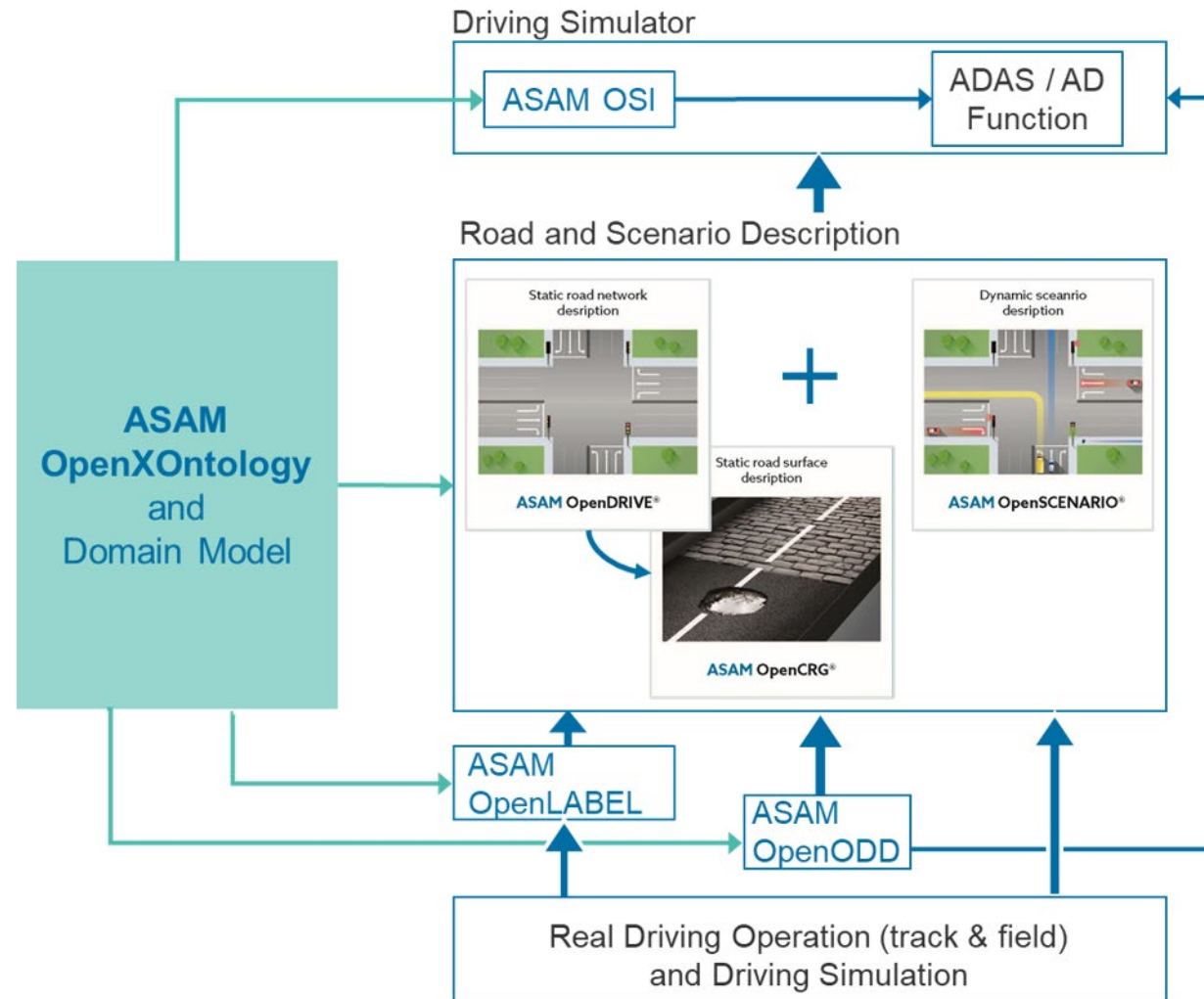
ASAM OpenXOntology

- Proposal approved, start June 2020

- Domain Ontology: Definition of domain relevant terms and the possible relationships between them

- Goal: Link OpenX standards through a common ontology
  → increased inter-compatibility

- Deliverables:
  1. Core ontology for ASAM OpenX (Domain Simulation)
  2. Guidelines on integration into current and existing standards
  3. Migration/phasing examples for each OpenX standard
  4. Document containing guidelines on extension of the ontology
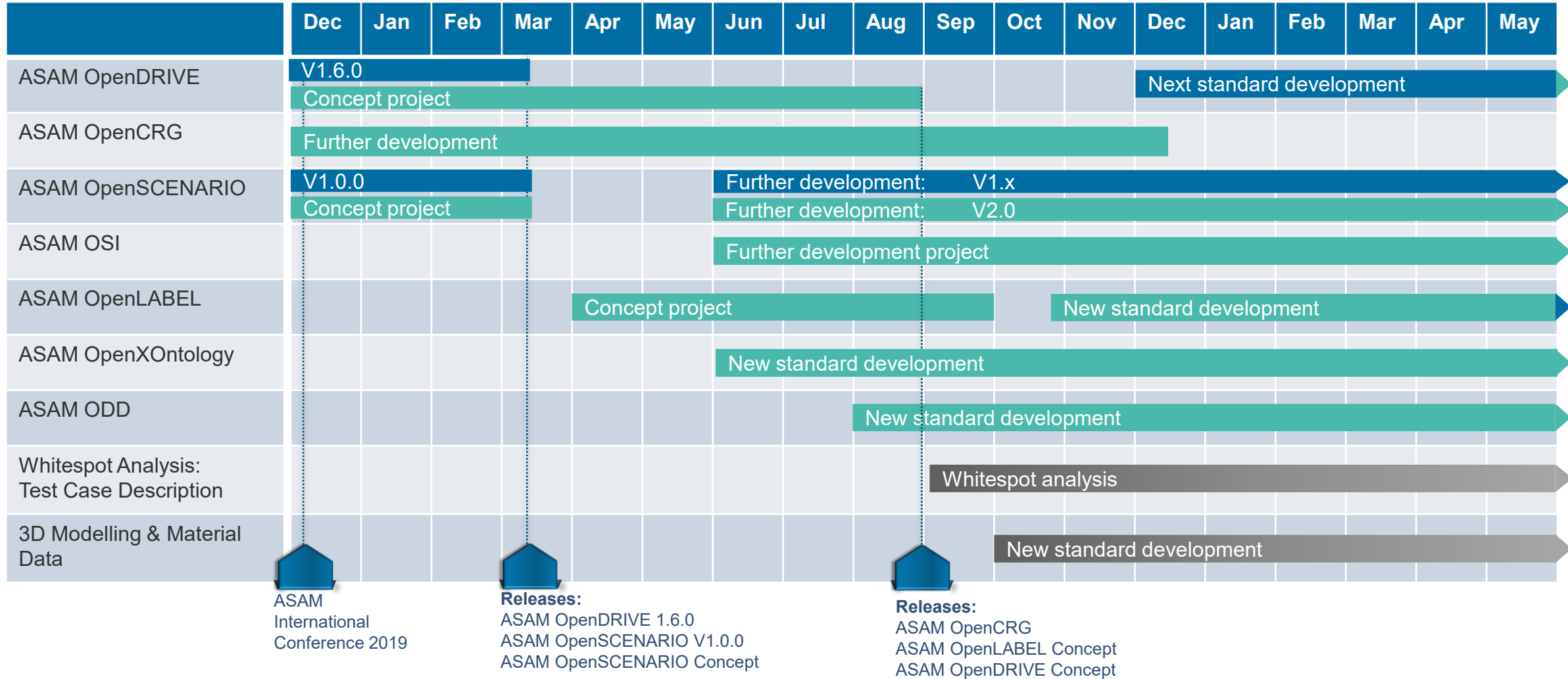
- Proposal link

ASAM OpenODD

- Proposal development phase (estimated start August)

- Ideation Workshop end of April 2020

- Proposal Workshop end of June 2020

- High interest: 100+ Participants!

- Standardized format for definition of Operational Design Domains (ODDs)

ASAM OpenX: Overview

Timeline 2020 / 2021

|	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
ASAM OpenDRIVE	V1.6.0													Next standard development				
	Concept project																	
ASAM OpenCRG	Further development																	
ASAM OpenSCENARIO	V1.0.0						Further development: V1.x											
	Concept project						Further development: V2.0											
ASAM OSI							Further development project											
ASAM OpenLABEL					Concept project					New standard development								
ASAM OpenXOntology							New standard development											
ASAM ODD							New standard development											
Whitespot Analysis: Test Case Description										Whitespot analysis								
3D Modelling & Material Data													New standard development					

ASAM International Conference 2019

Releases:
ASAM OpenDRIVE 1.6.0
ASAM OpenSCENARIO V1.0.0
ASAM OpenSCENARIO Concept

Releases:
ASAM OpenCRG
ASAM OpenLABEL Concept
ASAM OpenDRIVE Concept

ASAM

Coordination Group: Simulation

What is it about?

ASAM

Coordination Group: Simulation (CG:Sim) vs. TSC

CG:Sim	TSC
Develop/maintain the ASAM Simulation roadmap	**Financial decisions**
Strategic analysis • Identify/initiate further ASAM activities in Simulation • Ensure no overlap of standards • Ensure alignment with external activities	**Project approval**
	Sweeping changes to core scope of standards
Accelerate the ASAM decision making process • Pre-approval, final approval stays with TSC	**Next escalation level above CG:Sim**
	Control mechanism
Review and refine relevant processes • e.g. development and release process, collaborative software development, etc.	**Managerial authority**

ASAM

Coordination Group: Simulation

Setup
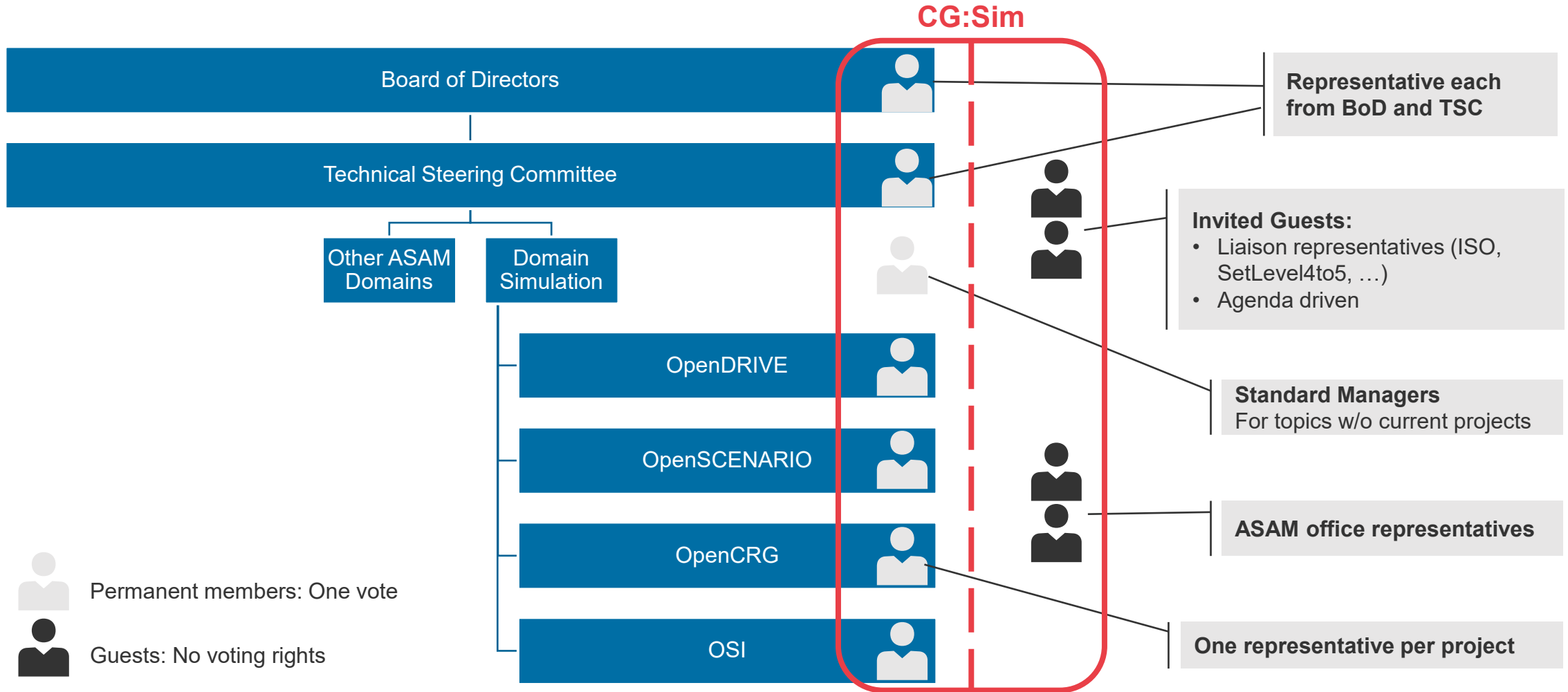
ASAM Office

A New Active Team "At Your Disposal" – At Any Time

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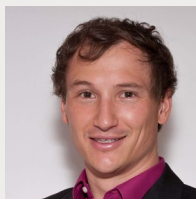Management Assistant
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Thank you!

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www.asam.net

ASAM