OPEN
AUTO DRIVE
FORUM

OADF activities

Report for the SIP-adus Workshop 2020 on 10-12 November

Matthias Unbehaun | Speaker of the Open Auto Drive Forum & TISA Executive Director

Brief introduction of the OADF

- founded by **NDS** and **ADASIS** in November 2015
  - first meeting in December 2015
- **SENSORIS, SIP-adus, TISA** and **TN-ITS** joined shortly after
- Close collaboration with ASAM on **OpenDRIVE** and **OpenSCENARIO**

Automated/autonomous driving requires international standards for maps and global cooperation between all stakeholders.

OADF Terms (excerpt)

Objectives

- Platform to present the latest developments
- Discussion forum for cross-domain topics in automated/autonomous driving
- Generate input for standardization
- Connect authorities and industry

Mission

- Develop solutions for automated/autonomous driving, which work in the reference ecosystem

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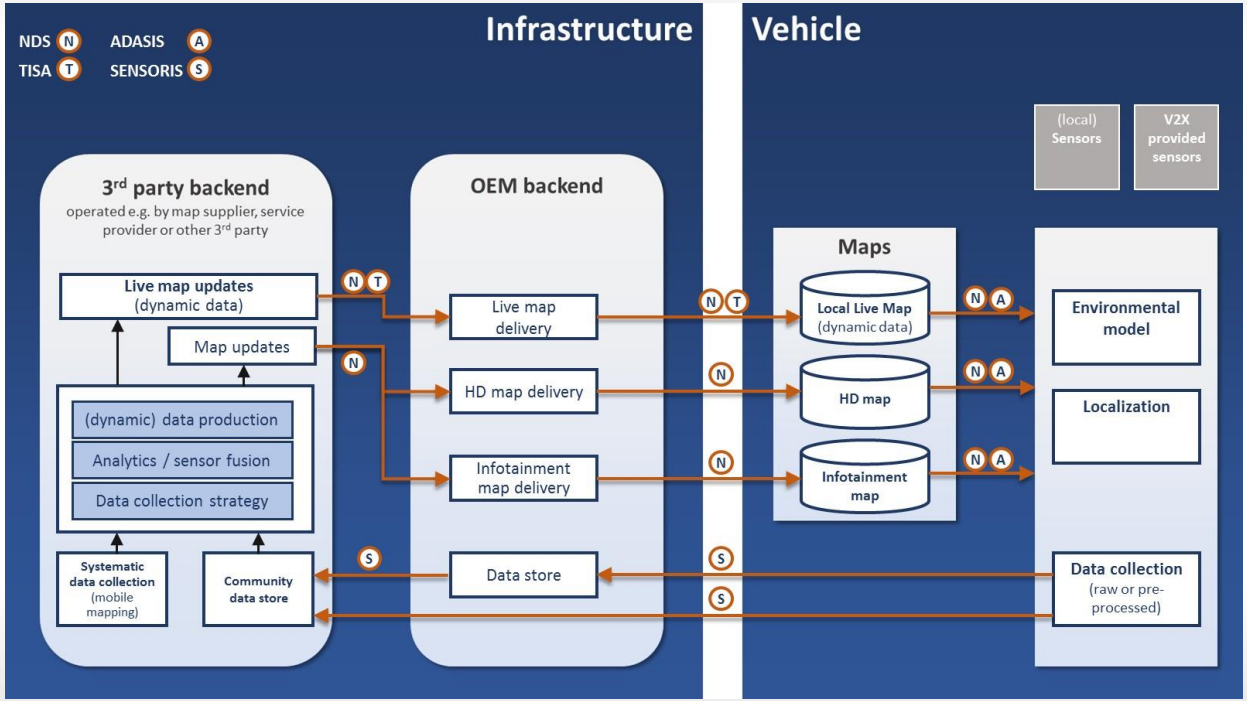
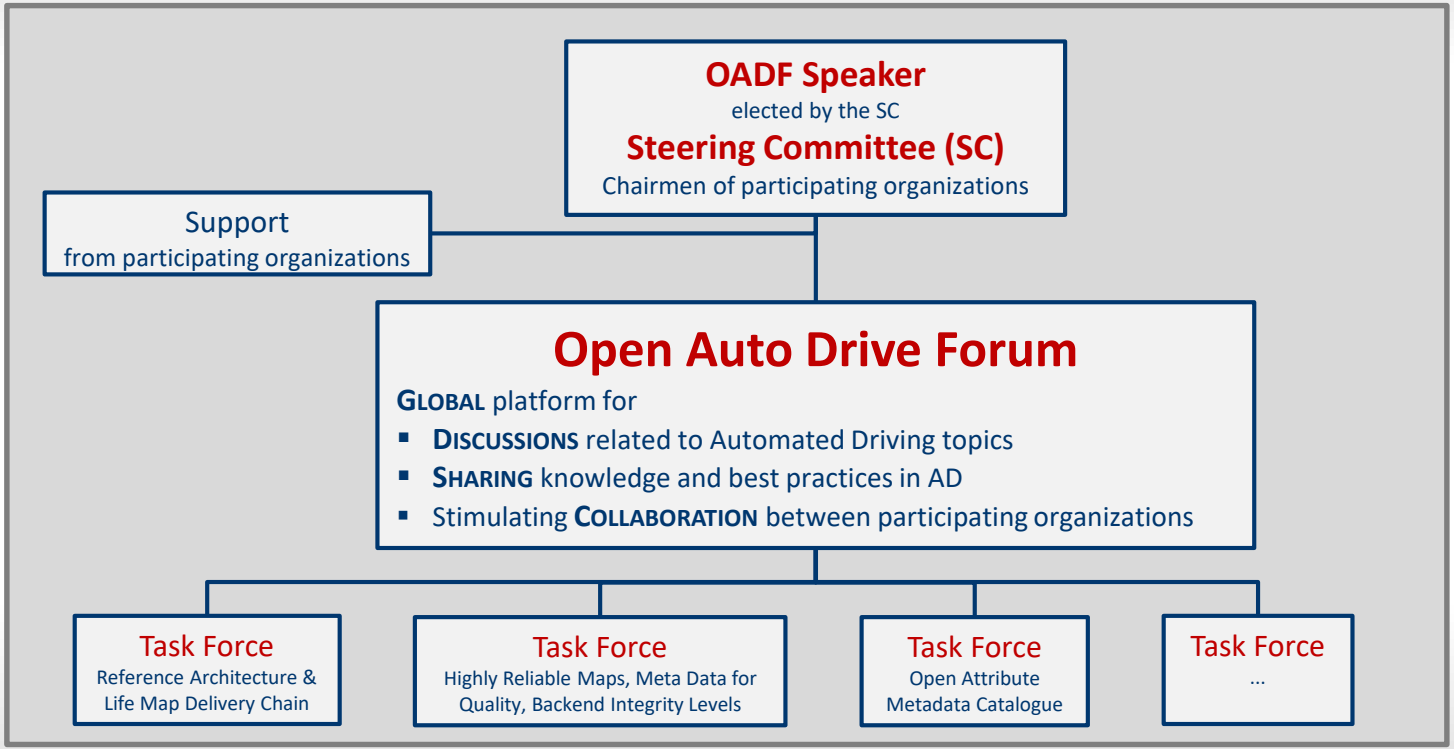
OADF Ecosystem



OADF Structure



OADF steering committee

Chairmen/directors of the participating organizations

ADASIS	**Michael Klingsöhr** (Bosch)
NDS	**Martin Schleicher** (Elektrobit)
SENSORIS	**András Csepinszky** (NNG) and **Christian Heyn** (HERE)
SIP-adus	**Satoru Nakajo** (University of Tokyo)
TISA	**Matthias Unbehaun** (TISA Executive Office)
TN-ITS	**Christian Kleine** (HERE)

Current OADF speaker

Matthias Unbehaun, TISA

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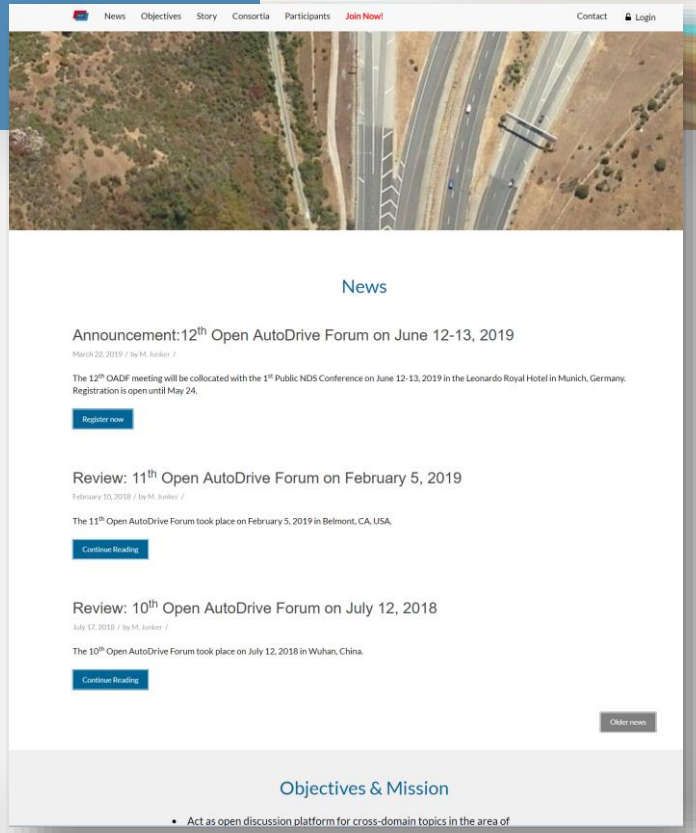
http://openautodrive.org/

Public dissemination platform

- OADF materials
  - Meeting minutes
  - Presentations
  - Reference documents

  accessible to registered OADF members

Simply register for obtaining access.



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Working mode and meetings

The OADF members agreed on the following

- The forum meets 2-3 times per year on different continents (rotating)
- The forum consists of a plenum and interactive/breakout sessions
- The forum initiates Task Forces (TFs) where needed
- TFs operate between the forum meetings

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Activities of ADASIS

ADAS Horizon provides upcoming road information for the driver and assistance systems

Map database

Layers

e. g. hazard spots

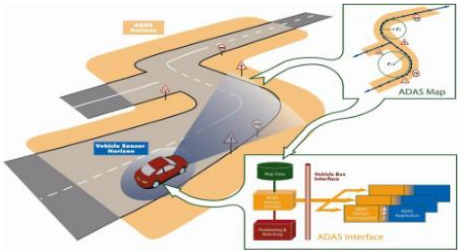
e. g. traffic information

e. g. speed limits

30

Digital map (static)

Map data (e.g. NDS Format)



- location and most probable path (MPP)
- Enrichment of MPP with e.g. topography, speed limits, etc.
- Conversion into ADASIS format

ADASIS

Relevant information for road ahead (ADASIS Format)

In-vehicle systems

HMI

ADAS, Energy Management

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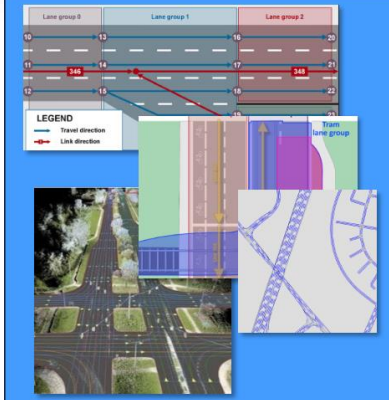
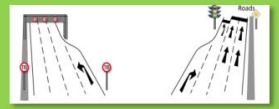
Activities of NDS

NDS HD Map Features

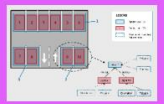


HD Lanes

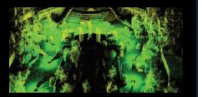


Localization Landmarks

Obstacles



Parking



Occupancy Grid (Extension)

Road Topology & Geometry

NDS.Classic

NDS 2.5.x (embeded)

NDS.Live

Streamable

Common Core

Embedded

NDS Roadmap

Focus	2020	2021	2022 (subject to change)	2023 (subject to change)	2024 (subject to change)
Future Mobility	Automated Driving (L4) • Highways • Automated Valet Parking (PoC level)	Automated Driving (L4) • Trucks Hub to Hub • Urban Roads • Automated Valet Parking	Automated Driving (L4) • Rural Roads	• Driverless Cars (L5) • Smart Cities (Active Traffic Management)	
NDS as a Service	• Living Map Architecture • Electronic Horizon Map Services	• Use of multiple map services and service types • Basic Navigation Services (online and hybrid) • e-Mobility map related Services (e.g. Range Calculation)			
Connected Map Data Platform	• Cloud Platform: validated • Functional Safety Concept documented	• Cloud Platform: series ready • Functional Safety Concept implemented	Car to X Extension	Car to Car Extension	Decentralized Map Provision (5G-Technology)

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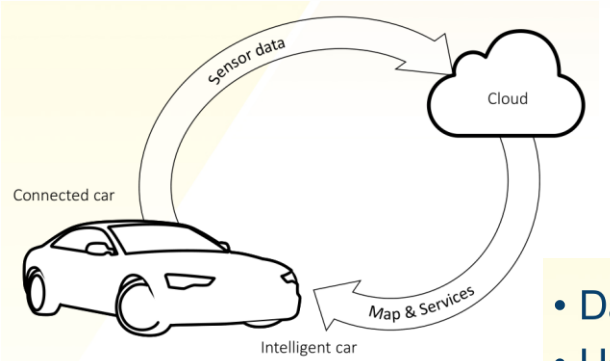
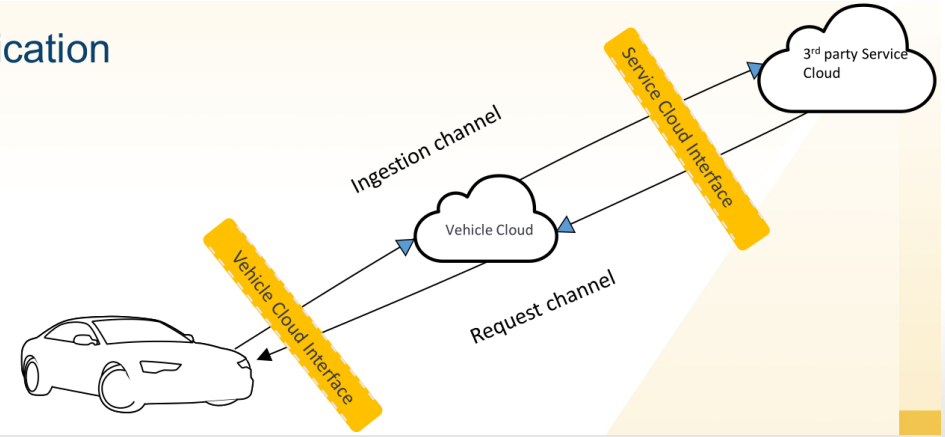
Activities of SENSORIS



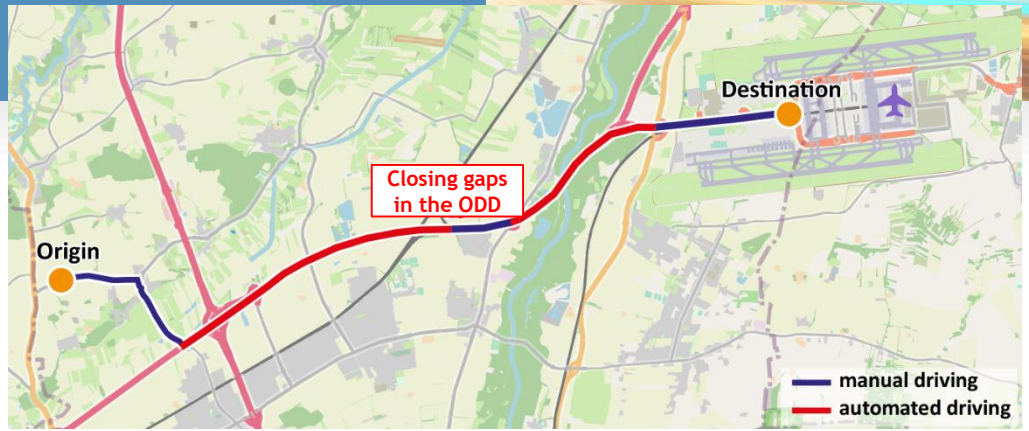
- New Release
  - V1.2.0 released internally (June 2020) – including 9 change requests
- Public Release
  - V1.1.1 released externally (July 2020) – including 4 change requests with relevant bug fixes
  - License CC BY-ND 4.0

- Data Format Specification
- Use Cases
- Content
- Updates
- Compatibility



Activities of TISA

- Limited range of on-board sensors
- Limited capabilities and operation environments of AD sensors
- Possibly conflicting information from different sources
- Driving comfort



- Safe driving
- AD clearance
- Alignment with applicable legislation

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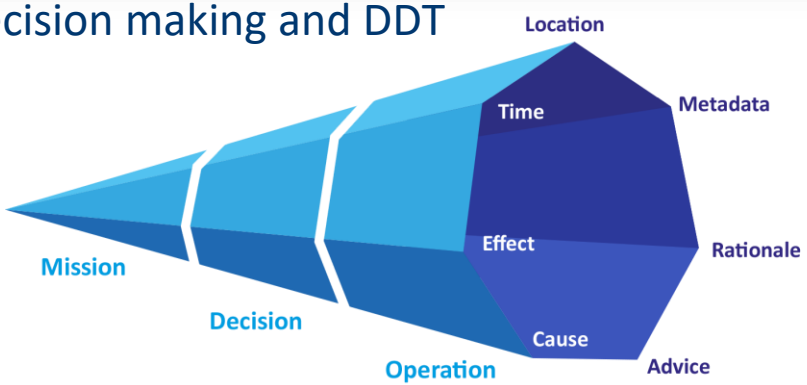
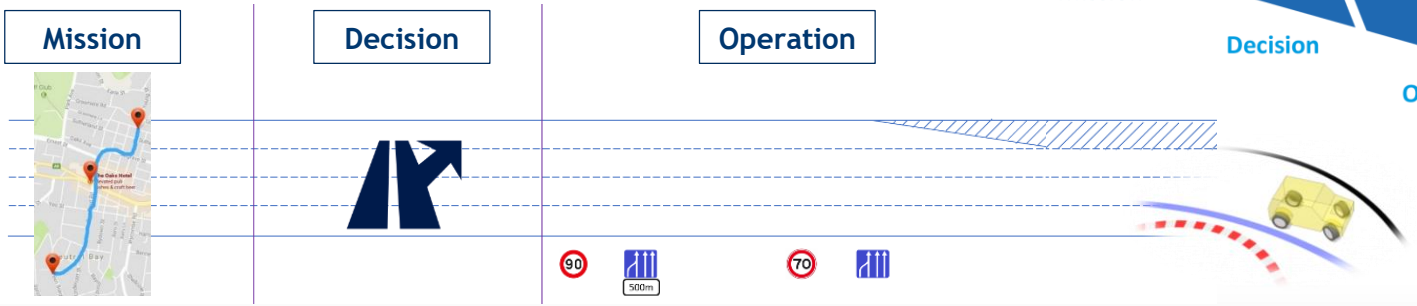
Activities of TISA

- M-D-O paradigm mirrors phases of AD decision making and DDT
- Same information structure for all phases
- Increasing refinement/granularity



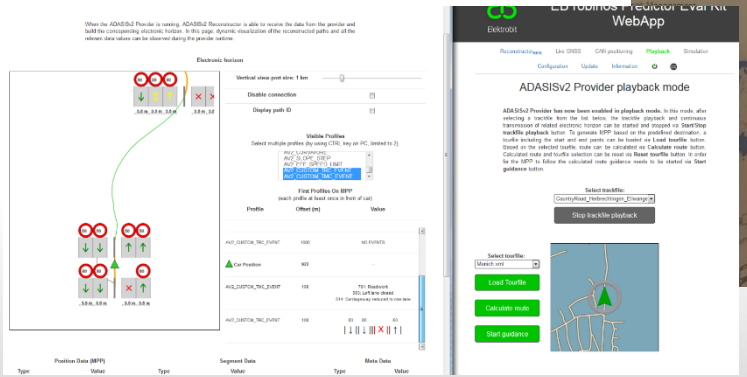


Whitepaper summarizing the technical aspects and concepts of TPEG3
http://tisa.org/wp-content/uploads/TISA19015_I4AD_Technical-Whitepaper_approved-1.pdf
Whitepaper addressing the business requirements and stakeholders of TPEG3
http://tisa.org/wp-content/uploads/TISA19016_I4AD_Business-Whitepaper_approved.pdf

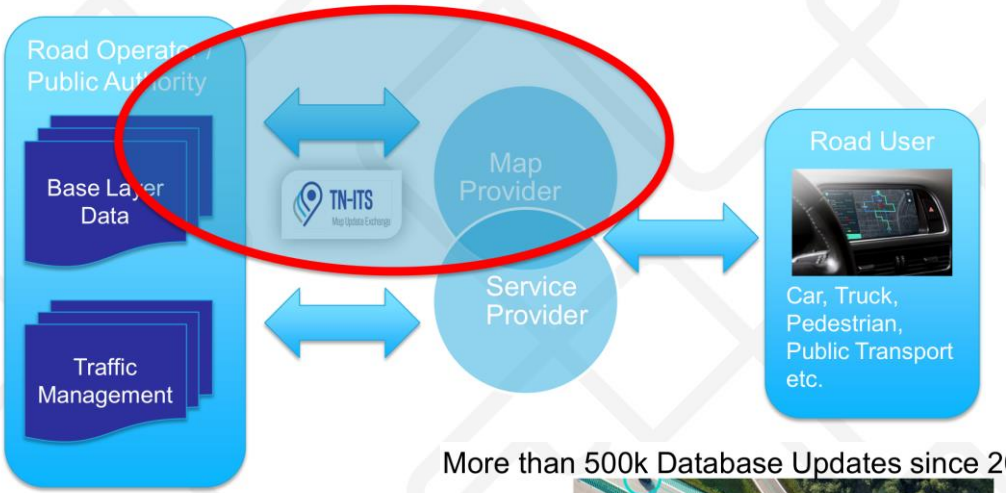
Collaboration TISA – ADASIS

Demonstrator at the ITS World Congress Singapore Oct 2019

- Pre-TPEG3 traffic data for AD mapped onto ADASIS electronic horizon
- Initiated by TISA and developed by the TISA members Elektrobit and GEWI



Activities of TN-ITS



Exchange information on changes in road attributes

- Base Layer Data used in digital maps
- Road attributes based on regulations
  - Speed limits
  - Other restrictions and warning signs

More than 500k Database Updates since 2017

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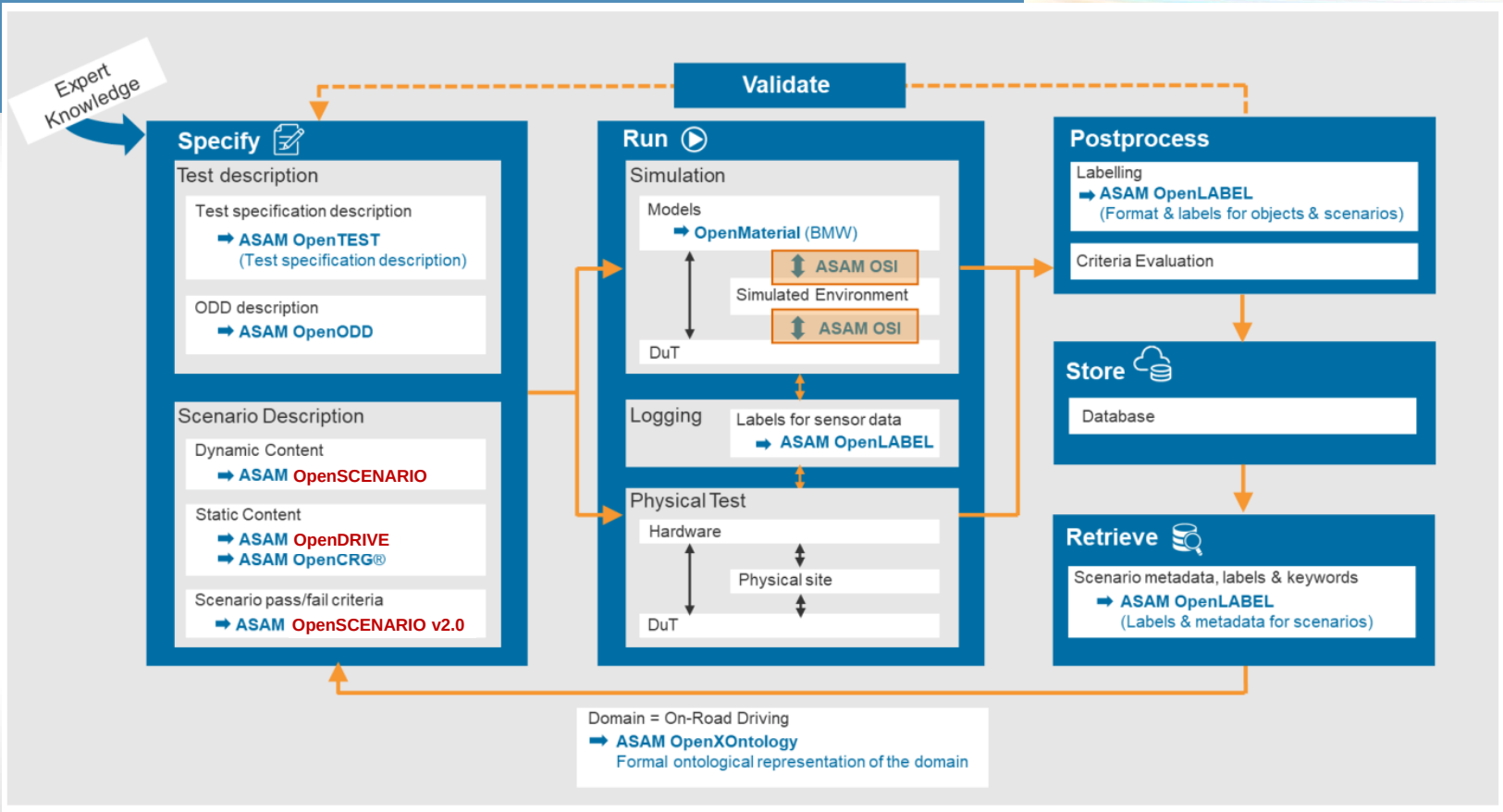
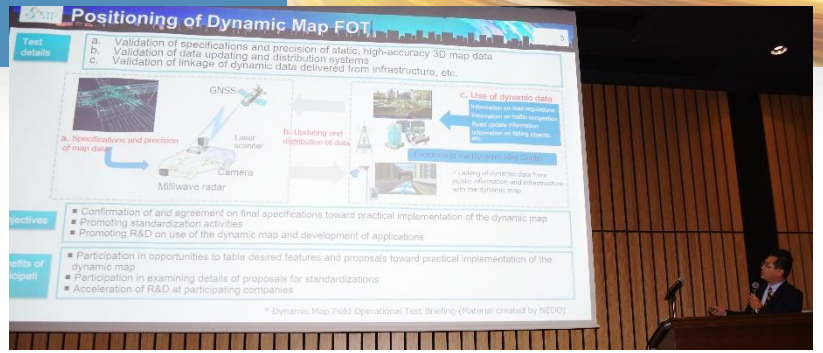
Activities of OpenDrive & OpenScenario



Collaboration with SIP-adus

SIP-adus is following OADF activities since the Feb 2017 meeting in Brussels, where Prof. Satoru Nakajo participated

- Intensifying discussions at the OADF meeting in Nov 2017, where Prof. Nakajo was instrumental in facilitating the hosting of the event in Tokyo
- In **Feb 2019, SIP-adus was officially included in the group of OADF founding members**, including the seat in the Steering Committee



Prof. Nakajo presenting SIP-adus at the 8th OADF meeting in Tokyo


Congratulations to Mr. Hiroki Sakai, who participated on behalf of SIP-adus at the 11th OADF meeting in Belmont, CA

Collaboration with SIP-adus

- **Sharing of experiences from FOT regarding**
  - technical concepts
  - ongoing development work
  - deployment and testing

  is a very valuable input to the discussions and conceptual work of the OADF and it member standardization organizations

Example: Collaboration with ADASIS

- Cooperation letter & exchange of ADASIS v3.1.0 specification
- Possibility of using ADASIS as standard for delivering signal info in SIP-adus

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OADF Contact

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http://openautodrive.org/