



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)

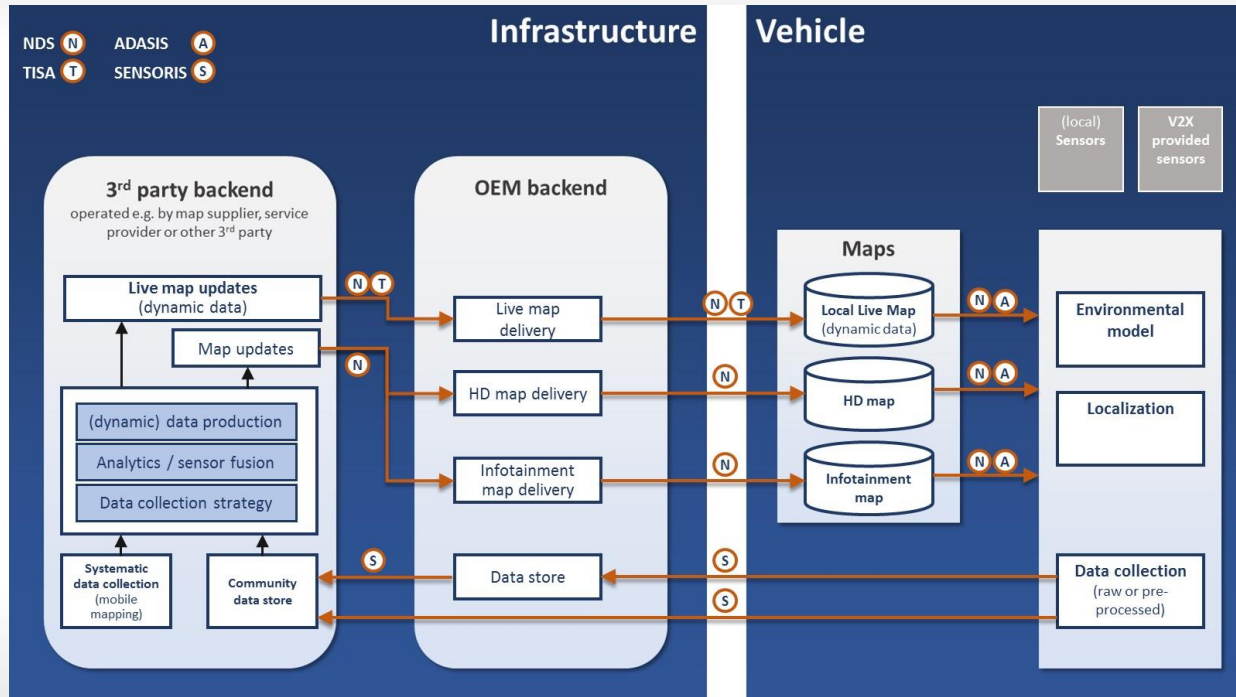
Objectives

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

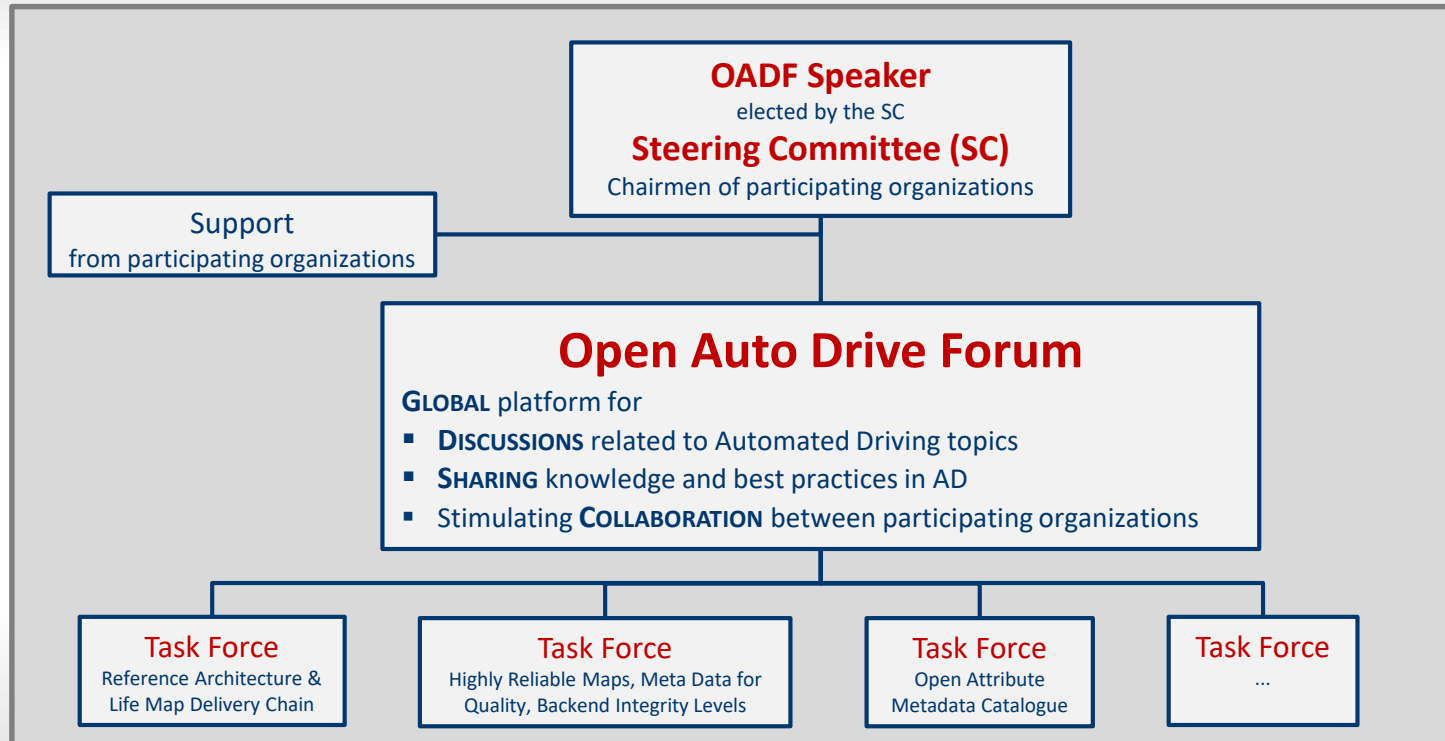
Mission

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

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

<http://openautodrive.org/>

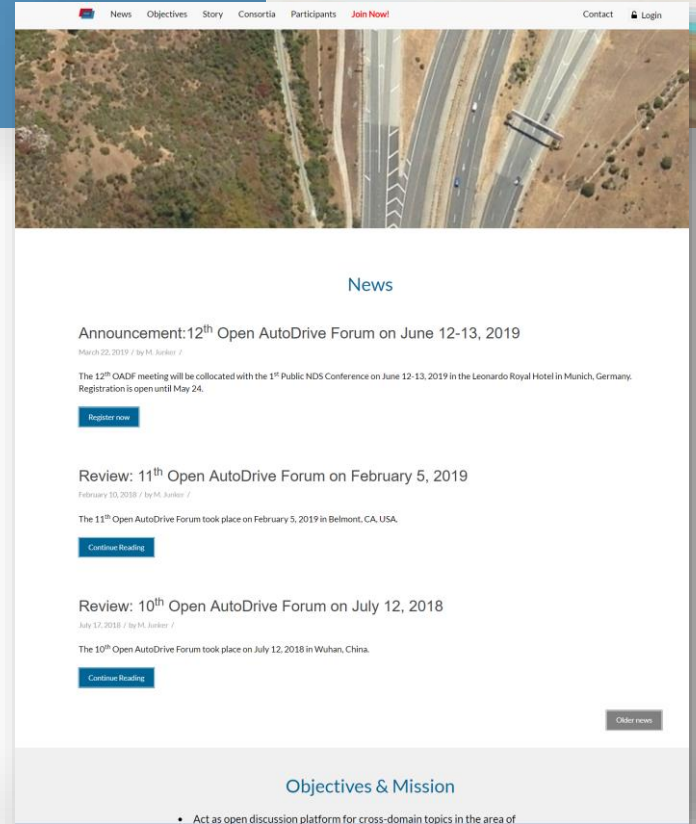
Public dissemination platform

■ OADF materials

- Meeting minutes
- Presentations
- Reference documents

accessible to registered OADF members

Simply register for obtaining access.



The screenshot shows the website's navigation bar with links for News, Objectives, Story, Consortia, Participants, and Join Now!, along with Contact and Login options. The main content area features a 'News' section with three articles:

- Announcement: 12th Open AutoDrive Forum on June 12-13, 2019**
March 22, 2019 / by M. Junker /
The 12th OADF meeting will be collocated with the 1st Public NDS Conference on June 12-13, 2019 in the Leonardo Royal Hotel in Munich, Germany. Registration is open until May 24.
[Register now](#)
- Review: 11th Open AutoDrive Forum on February 5, 2019**
February 10, 2019 / by M. Junker /
The 11th Open AutoDrive Forum took place on February 5, 2019 in Belmont, CA, USA.
[Continue Reading](#)
- Review: 10th Open AutoDrive Forum on July 12, 2018**
July 17, 2018 / by M. Junker /
The 10th Open AutoDrive Forum took place on July 12, 2018 in Wuhan, China.
[Continue Reading](#)

At the bottom right of the news section is a [Order news](#) button. Below the news section is the 'Objectives & Mission' section, which includes the bullet point: 'Act as open discussion platform for cross-domain topics in the area of'.

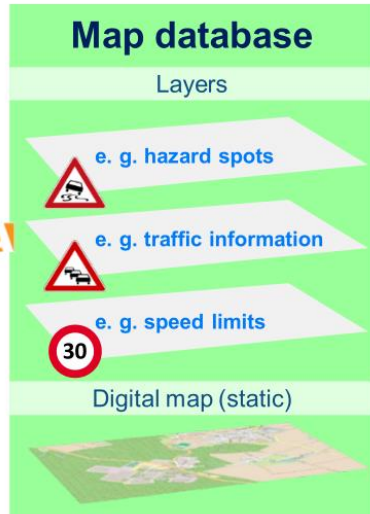
Working mode and meetings

The OADF members agreed on the following

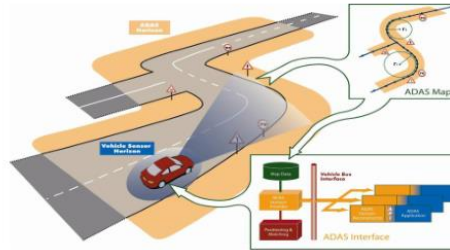
- The forum meets 2-3 times per year on different continents (rotating)
- The forum consists of a plenum and interactive/breakout sessions
- The forum initiates Task Forces (TFs) where needed
- TFs operate between the forum meetings

Activities of ADASIS

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



Map data (e.g. NDS Format)

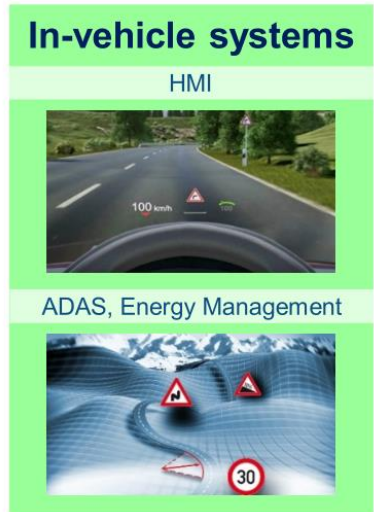


- ▶ location and most probable path (MPP)
- ▶ Enrichment of MPP with e.g. topography, speed limits, etc.
- ▶ Conversion into ADASIS format

ADASIS



Relevant information for road ahead (ADASIS Format)

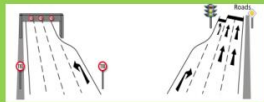


Activities of NDS

NDS HD Map Features



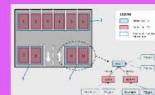
HD Lanes



Localization Landmarks



Obstacles



Parking



Occupancy Grid (Extension)

Road Topology & Geometry

NDS.Classic

NDS 2.5.x
(embedded)

NDS.Live

Streamable

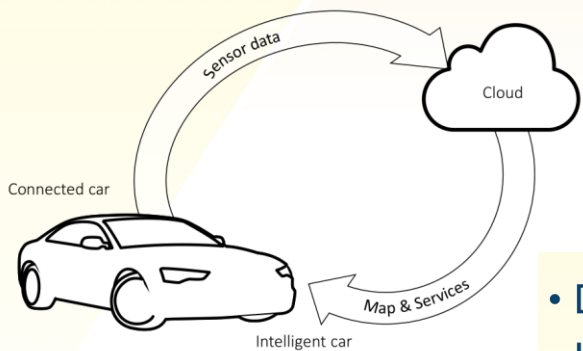
Common Core

Embedded

NDS Roadmap

Focus	2020	2021	2022 (subject to change)	2023 (subject to change)	2024 (subject to change)
Future Mobility	Automated Driving (L4) <ul style="list-style-type: none"> Highways Automated Valet Parking (PoC level) 	Automated Driving (L4) <ul style="list-style-type: none"> Trucks Hub to Hub Urban Roads Automated Valet Parking 	Automated Driving (L4) <ul style="list-style-type: none"> Rural Roads 	<ul style="list-style-type: none"> Driverless Cars (L5) Smart Cities (Active Traffic Management) 	
NDS as a Service	<ul style="list-style-type: none"> Living Map Architecture Electronic Horizon Map Services 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Cloud Platform: validated Functional Safety Concept documented 	<ul style="list-style-type: none"> Cloud Platform: series ready Functional Safety Concept implemented 	Car to X Extension	Car to Car Extension	Decentralized Map Provision (5G-Technology)

Activities of SENSORIS



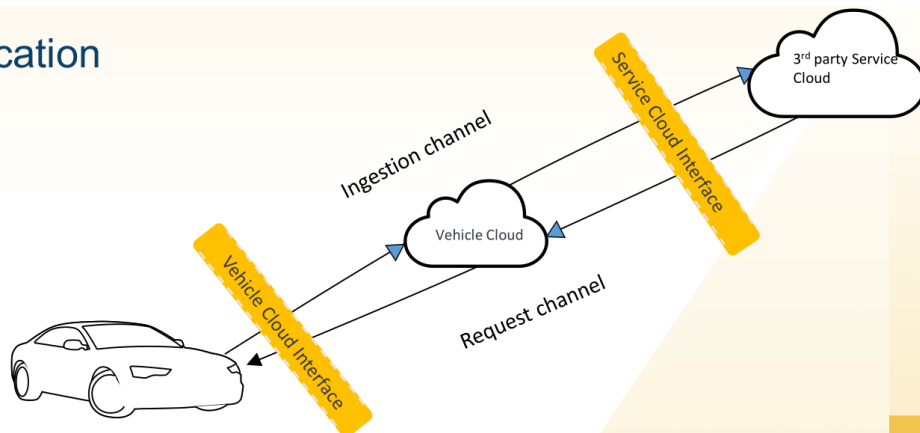
- Data Format Specification
- Use Cases
- Content
- Updates
- Compatibility

• New Release

- V1.2.0 released internally (June 2020) – including 9 change requests

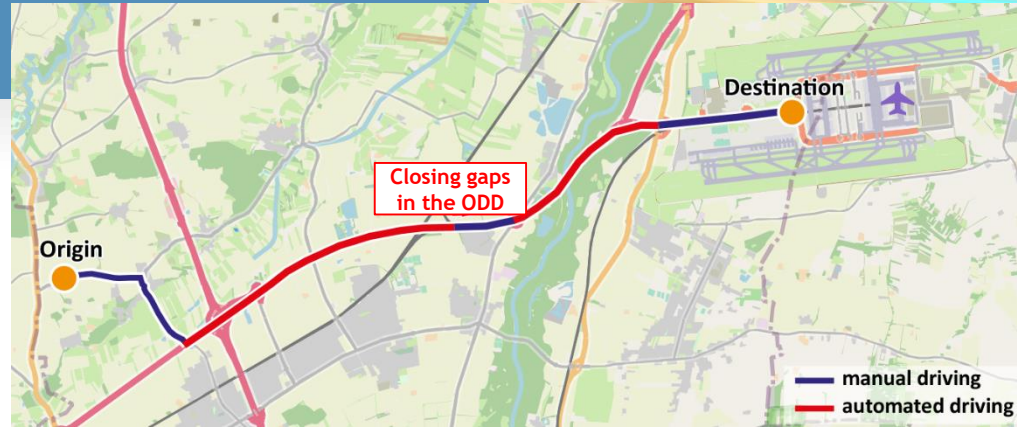
• Public Release

- V1.1.1 released externally (July 2020) – including 4 change requests with relevant bug fixes
- License CC BY-ND 4.0



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

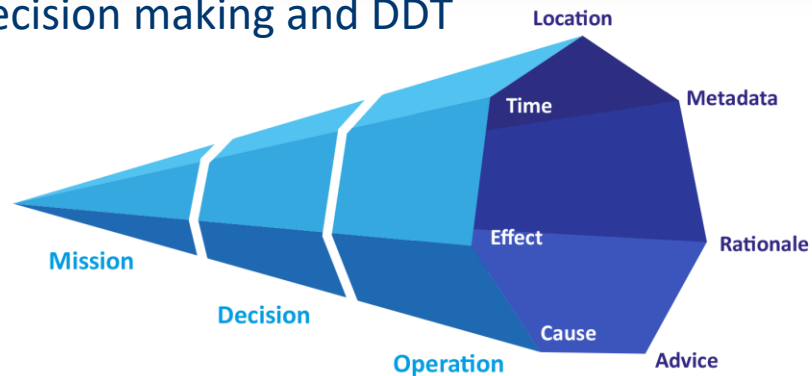
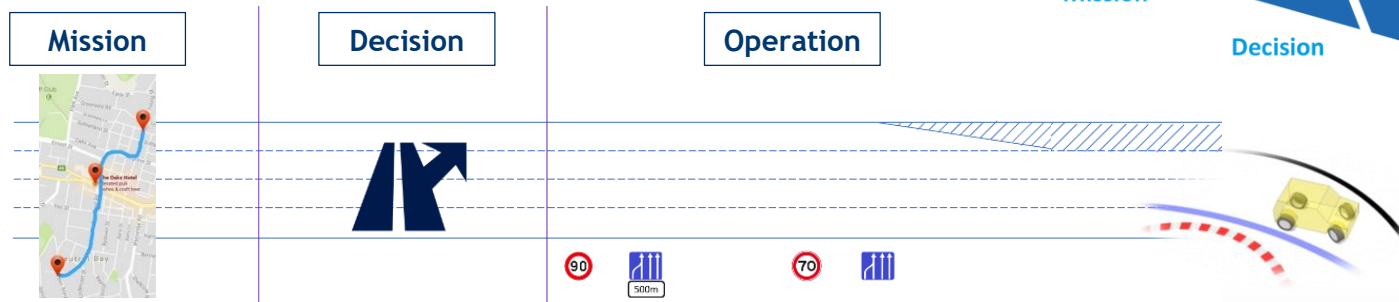


- Safe driving
- AD clearance
- Alignment with applicable legislation



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

When the ADASIS2 Provider is running, ADASIS2 Reconstructor is able to receive the data from the provider and build the corresponding electronic horizon. In this step, specific trajectories of the reconstructed paths and all the relevant data values can be observed during the provider session.

Electronic Horizon

Vertical view: post view: 1 km

Display path ID: 3436.3436.3436

Visible Profiles

Select multiple profiles (by using CTRL key on PC, limited to 3):

- ADASIS2_PROVIDER
- ADASIS2_PROVIDER
- ADASIS2_PROVIDER

Stop Profiles On 8000 (each path at least once in front of car)

Profile	Offset (m)	Value
ADASIS2_PROVIDER	100	8000
ADASIS2_PROVIDER	400	8000
ADASIS2_PROVIDER	100	8000

Position Data (BMP)

Type	Value	Type	Value	Type	Value

Segment Data

Type	Value	Type	Value	Type	Value

Meta Data

Type	Value	Type	Value	Type	Value

EB Robins Predictor Eval Kit WebApp

ADASIS2 Provider playback mode

Select profile:

Stop track playback

Select profile:

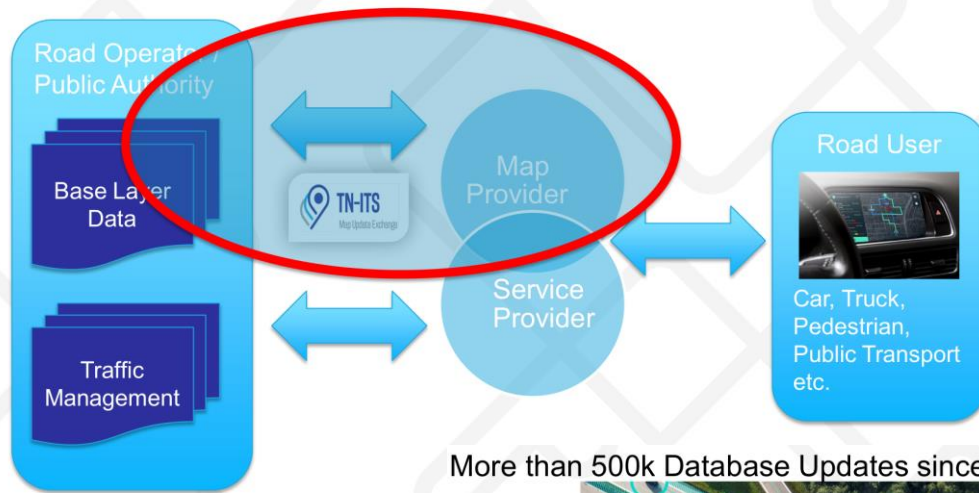
Load Profile

Calculate route

Start guidance



Activities of TN-ITS



More than 500k Database Updates since 2017

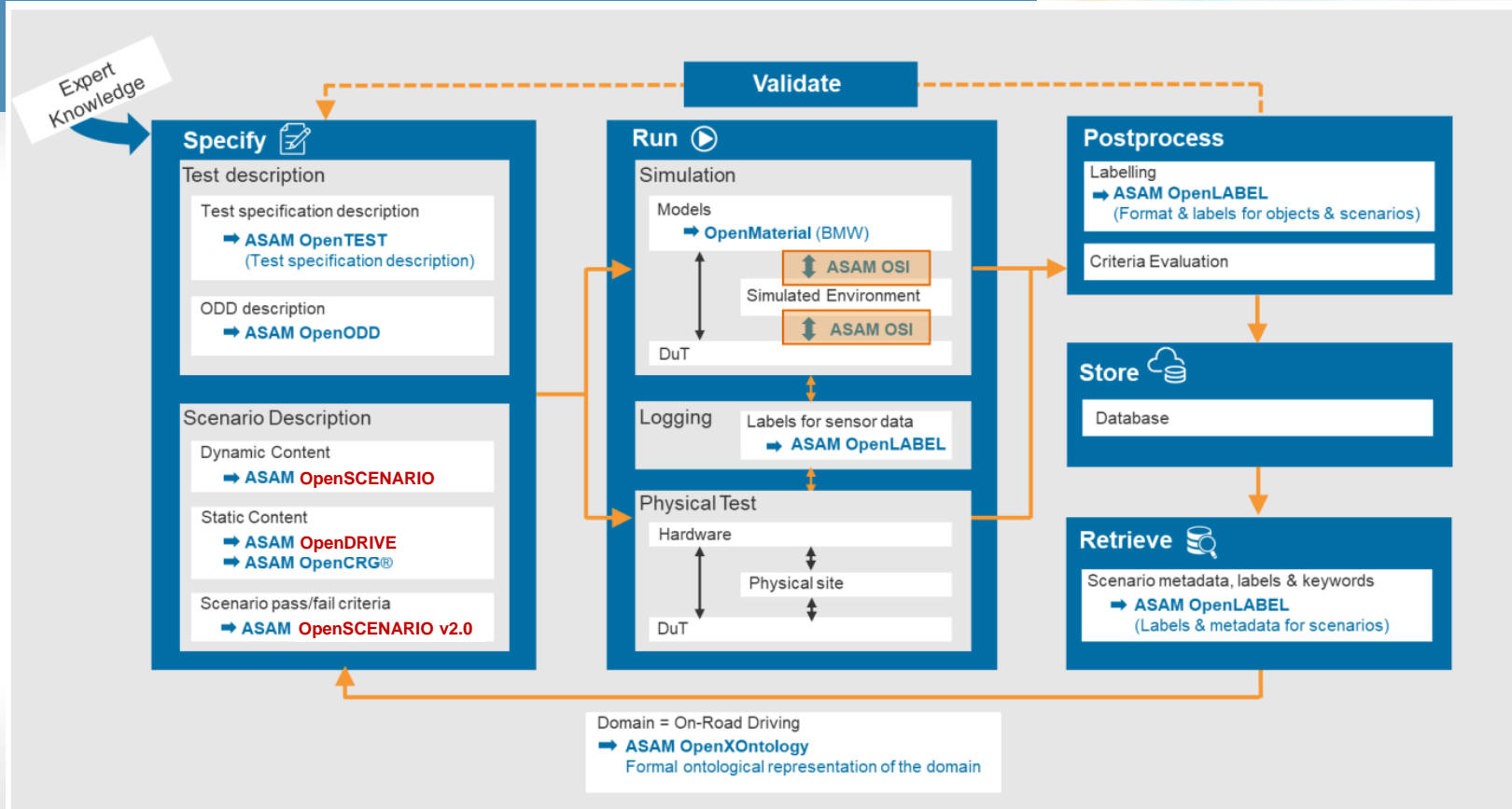


Exchange information on changes in road attributes

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



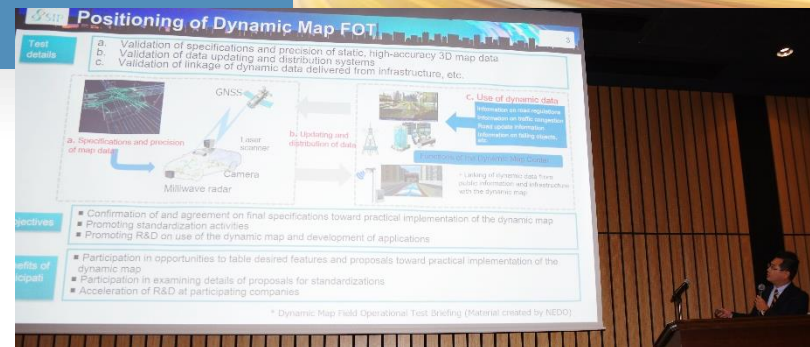
Activities of OpenDrive & OpenScenario



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 its 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

OADF Contact

c/o Navigation Data Standard (NDS) e.V.

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<http://openautodrive.org/>