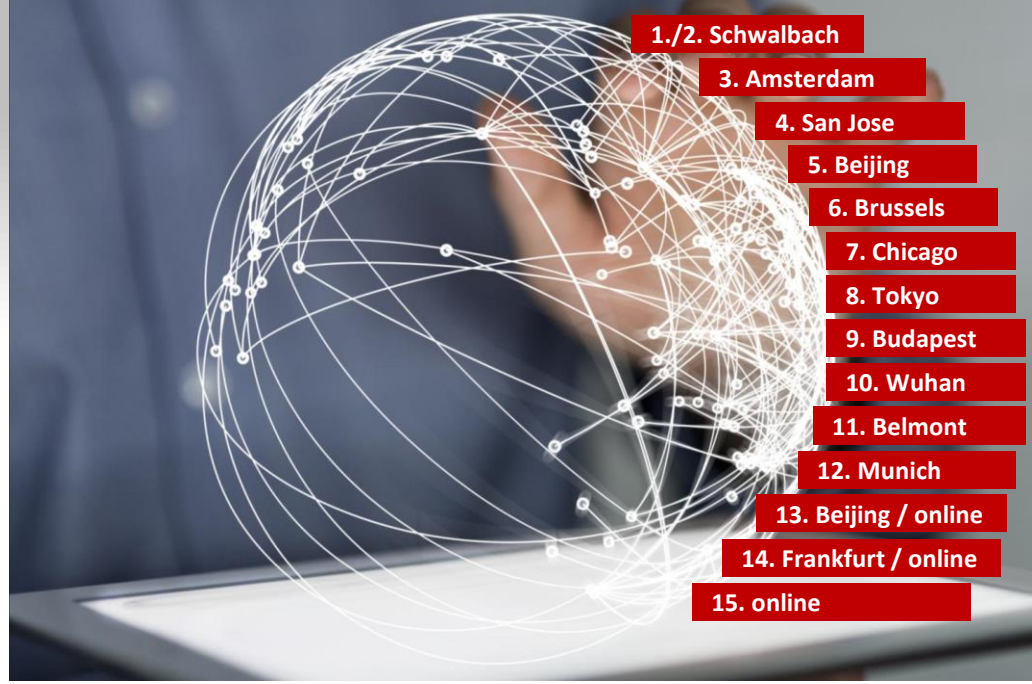
OPEN
AUTO DRIVE
FORUM



OADF – status update

Andras CSEPINSZKY| Speaker of the Open Auto Drive Forum & SENSORIS co-chair

SIP-adus Workshop 2021 Plenary Session

The initiative

A brief introduction of the **OPEN AUTO DRIVE FORUM**

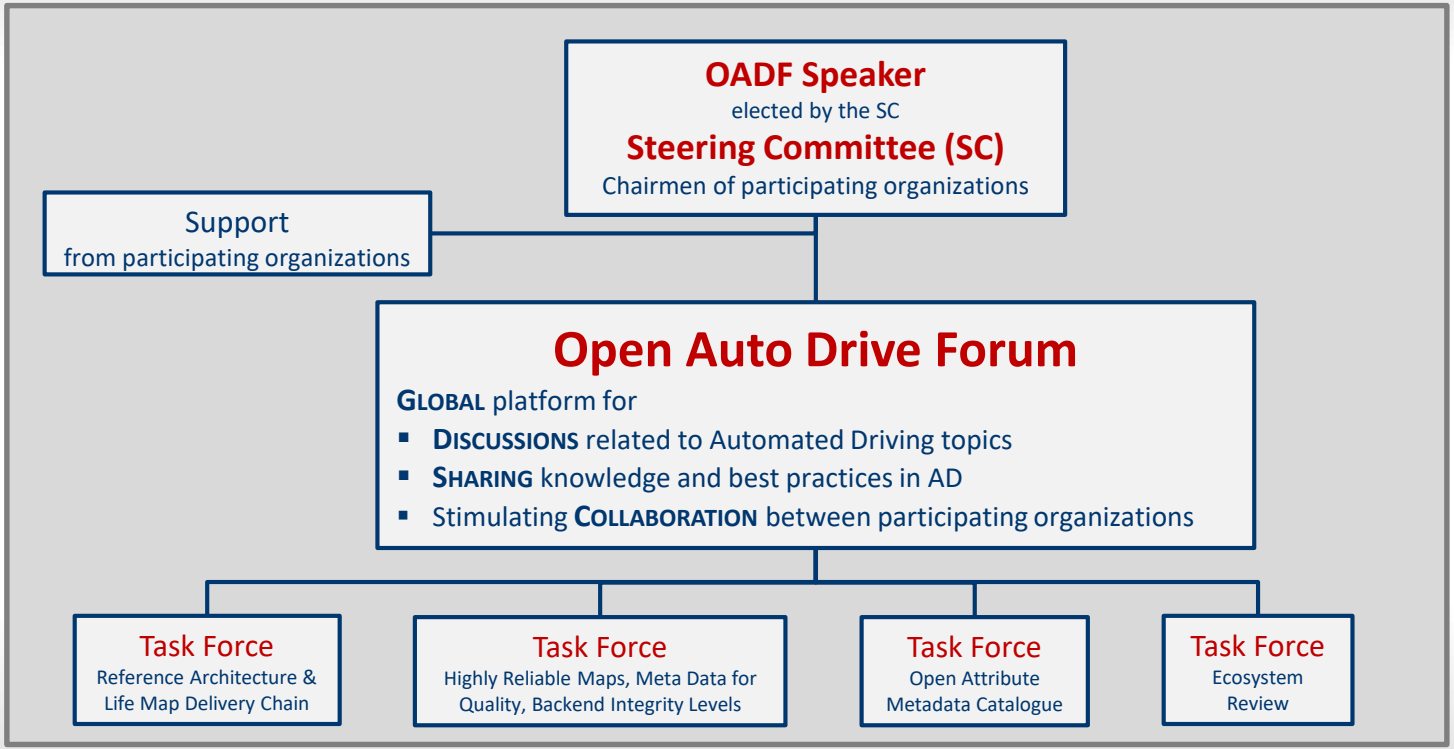
- founded by **NDS** and **ADASIS** in November 2015
  - first meeting in December 2015
- **SENSORIS, SIP-adus, TISA** and **TN-ITS** joined shortly after
- Close collaboration with ASAM on OpenDRIVE and OpenSCENARIO
- Discussions with ISO Technical Committees on collaboration modalities are ongoing

Historics of OADF

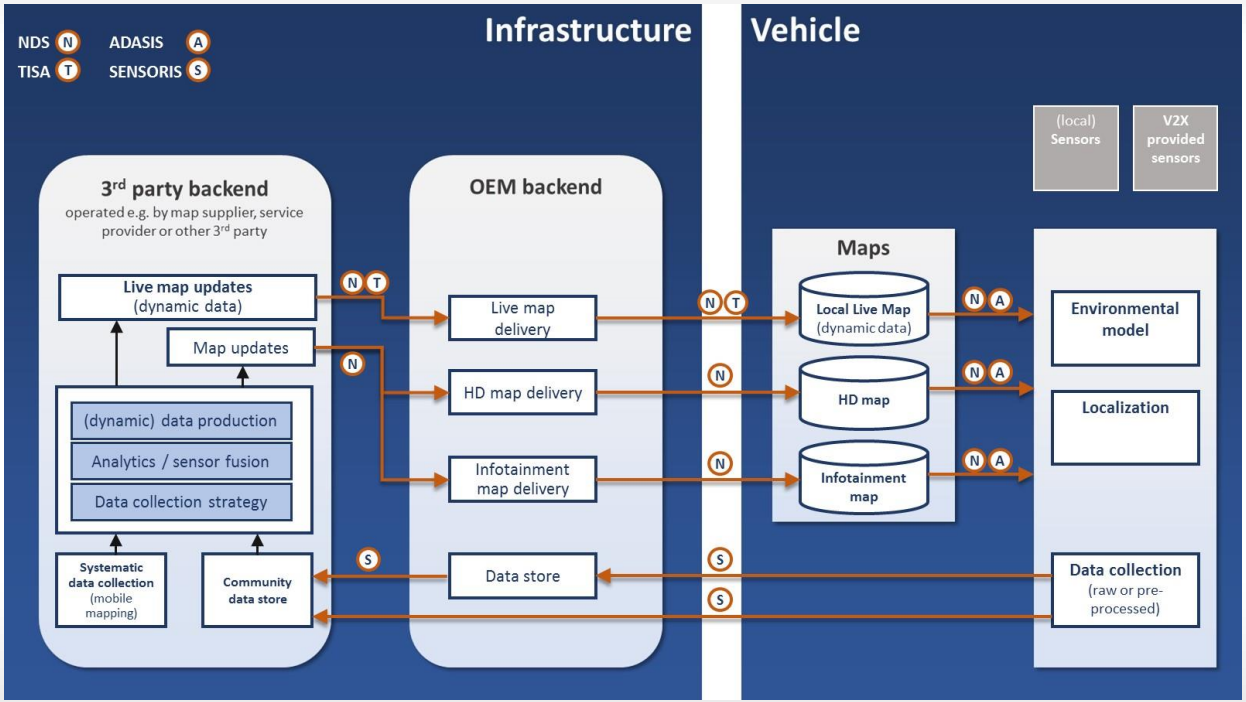
- **Volker Sasse** (NDS) was influential and leading in the initiating of the OADF.
- The Steering Committee agreed on a rotating Speaker role to chair the meetings
- Volker led the first 9 forum meetings as Speaker
- **András Csepinszky** (SENSORIS) took over at the OADF 15th meeting on the 6th May 2021 from **Matthias Unbehaun** (TISA), who have led the forum as Speaker for almost 3 years since the Wuhan meeting

1./2. Schwalbach
3. Amsterdam
4. San Jose
5. Beijing
6. Brussels
7. Chicago
8. Tokyo
9. Budapest
10. Wuhan
11. Belmont
12. Munich
13. Beijing / online
14. Frankfurt / online
15. online
16. online

OADF Structure

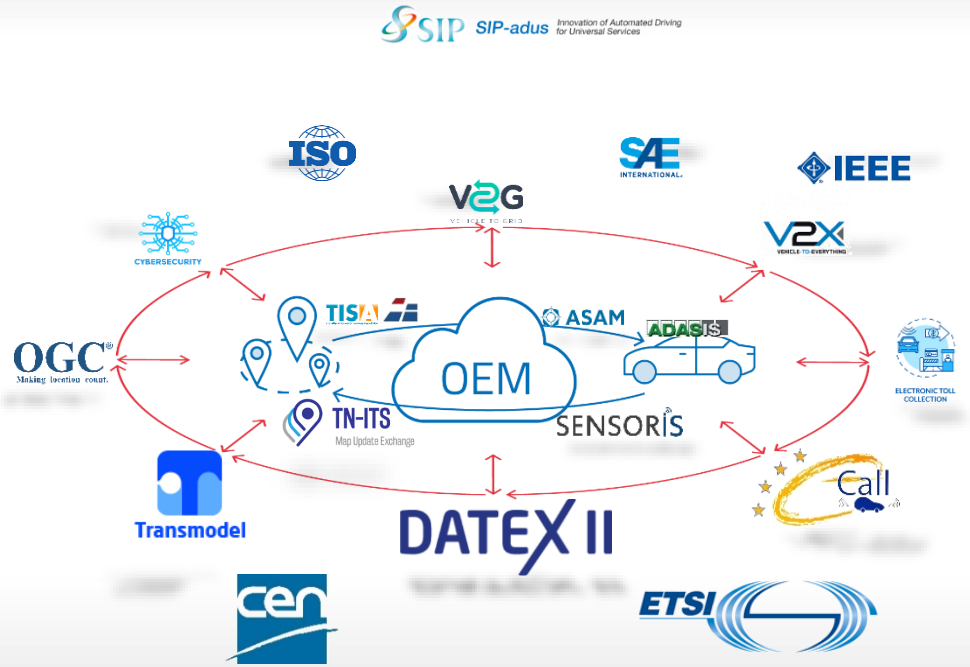


OADF ecosystem – under revision



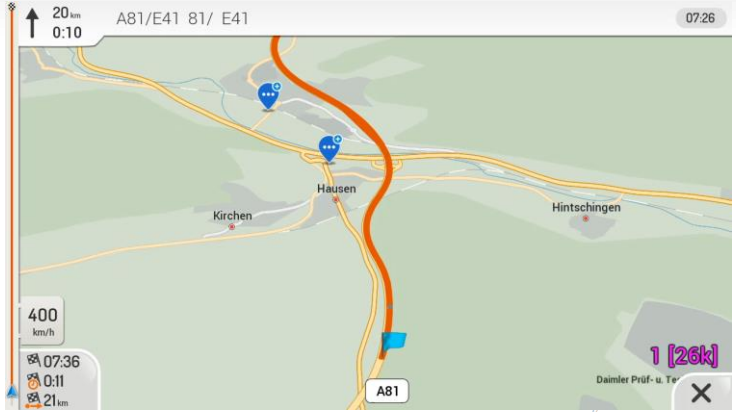
OADF ecosystem – under revision

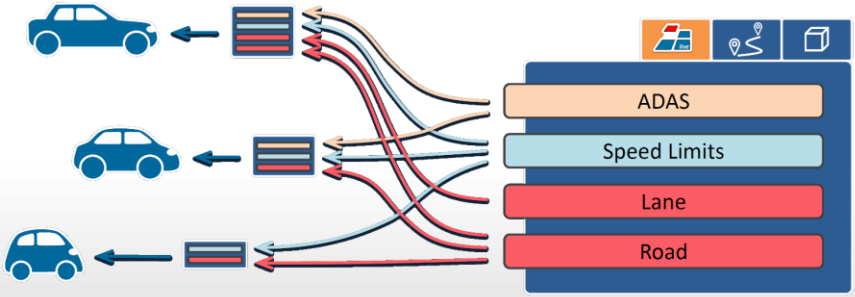
- Inner data loop consists of the well known OADF ecosystem elements (NDS, TISA, ADASIS, SENSORIS, TN-ITS, SIP-adus) with the collaboration of ASAM
- Outer loop consists of all other technologies supporting Automated Driving Systems
  - Cooperative Systems (eg. ETC 2.0 in Japan and 700 MHz intersection safety system)
  - Elements of ISAD (Infrastructure Supporting Automated Driving)
  - Other standards (infrastructure, public transport, cybersecurity, simulation, AD functions, etc.)
- Questions about the inner and the outer loops and their interaction need to be discussed



NDS – latest achievements

- NDS.Live got specified and implementation was demonstrated during the NDS webinar
- NDS.Live has a new licencing agreement in order to provide access to non commercial implementation and evaluation
- NDS.Live provides up-to-date data, on a transport agnostic way with very flexible configurability





TISA – latest achievements

- **TISA is working on both generation 2 and generation 3 specifications**
  - Generation 2 is intended to be used by human drivers
  - Generation 2 is being extended by Emergency Alerts and Warnings
  - Generation 3 is intended to be used by machines in AD
  - Generation 3 is being demonstrated using simulated automated vehicle
- **TISA is a Category A liaison of ISO TC204**
  - Generation 2 specifications are known as ISO 21219 series standards
  - Generation 3 are not yet in the ISO pipeline

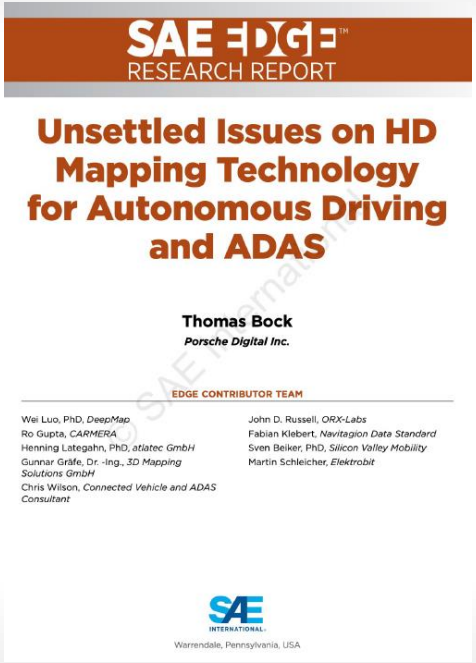
TN-ITS – latest achievements

- **TN-ITS has its specification developped by CEN TC278**
  - CEN/TS 17268 Intelligent transport systems – ITS spatial data – Data exchange on changes in road attributes soon under periodical review
- **TN-ITS GO project – EU funded**
  - TN-ITS got implemented in several EU member states
  - Implementation provided feedback to standardisation
- **EU co-funded project NAPCORE is starting**
- **TN-ITS and SENSORIS joint cooperation workshop**

Country	Data Provider	Service status		Coverage of updates		Map Attributes/Features		Location	Update	Service URL	NAP available	Data License (under revision)
		Launch	Level	Geography	Road network	Key attr.	Feat. types	Reference	Availability			
Finland	FTIA	Q3/2016	Operational	Full country	All roads	Speed Limits / Restrictions	Linear	OpenLR, GML	Daily	Link	Yes	Creative Commons BY 4.0
Flanders	MOW	Q4/2016	Operational	Full region	All roads	Speed Limits / Traf. Restrictions	Linear & Point	OpenLR, GML	Pilot (batch)	Link	Yes	Open Government License
UK	DfT	Q2/2017	Pilot	Regional	All roads + TenT	Restrictions (limited speed limits)	Linear & Point	GML	Monthly (restrictions)	Link	No	TBD (PSI: Open Gov. License 3.0)
Cyprus	PWD		Pilot							?		Creative Commons BY 4.0
Greece	Egnatia A.S.	Q1/2020	Pilot	Regional	part of TenT	Speed limits (toll stations, traffic signs)	Linear & Point	GML	Pilot (TBD)	Link	Yes	Creative Commons BY 4.0
Hungary	MAGYAR_KOZUT		Operational	Full country	All roads + TenT	Speed limits / Restrictions/Parking sites / Road signs	Linear & Point	GML	Daily	Link	Yes	TBD
Portugal	IP		Pilot	Full country	TEN-T	Speed Limits & Road Info	Linear	GML	Weekly	Codelist	No	TBD (PSI: Creative Commons BY 4.0)
Slovenia	AVP	2018	Pilot	Primary road network	TEN-T network, most of EU roads	Speed Limits/Warning/Stop/ Restrictions/RoadInfo	Linear & Point	OpenLR, GML, INSPIRE compatible	Pilot (batch)	Link	Yes	TBD
Sweden	STA	2014	Operational	Full country	All roads	Speed Limits/Restrictions/RoadInfo	Linear & Point	OpenLR, GML	Daily	On demand	Yes	Creative Commons BY 4.0
Ireland	DTTaS/NIUM	Q1/2017	Pilot	County(ies)	All roads + TenT	Speed Limits & Lane Info	Linear	OpenLR, GML		Q1 2021		Irish Governments Open Data License
France	IGN	Q1/2017	Pilot	Regional	All roads	FRC/FOW/LaneInfo /DrTF/AccessInfo	Linear			Q1 2021		Bespoke license (not Open Data)
Spain	DGT		Pilot							Q1 2021		TBD
The NL	RWS	2021	Pilot	Full country	TenT network	Speed limits/ Road info/Laneinfo	Linear & Point	OpenLR, GML	Monthly	Q1 2021	Yes	Creative Commons 0 1.0
Lithuania			Pilot							Q3 2021		TBD
Norway	NPRA	2015	Out	Full country	All roads	Speed Limits/Warning/Stop/ Restrictions/RoadInfo	Linear & Point	OpenLR, GML		-	Yes	Norwegian License for Open Gov. data

Challenges ahead of us I.

- **Unsettled issues in**
  - HD Map Creation
  - HD Map Change Detection & Update
  - Making HD Maps safe



Challenges ahead of us II.

- **Unsettled issues in**
  - **HD Map Creation**
  - HD Map Change Detection & Update
  - Making HD Maps safe

Data Collection suffers from

- Differences in sensor/setup
- Data collection & recording software
- In vehicle edge processing
- Upload to cloud
- Cloud processing
- Map specification/format
- Validation of the map

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Challenges ahead of us III.

- **Unsettled issues in**
  - HD Map Creation
  - **HD Map Change Detection & Update**
  - Making HD Maps safe

Change Detection and updates come with challenges

- First one to encounter problem/change
- Base map and localization
- Sensors and multi-sensor recognition
- What needs to be detected and reported
- Privacy concerns
- Data sharing
- Centralized Server
- The protocols used for data transmission
- Authorities support

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Challenges ahead of us IV.

- **Unsettled issues in**
  - HD Map Creation
  - HD Map Change Detection & Update
  - **Making HD Maps safe**

Issues to be considered

- Humans in the loop
- Tool certification
- Certified Ground Truth
- Quality vs. Speed of updates

OADF Contact

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

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http://openautodrive.org/