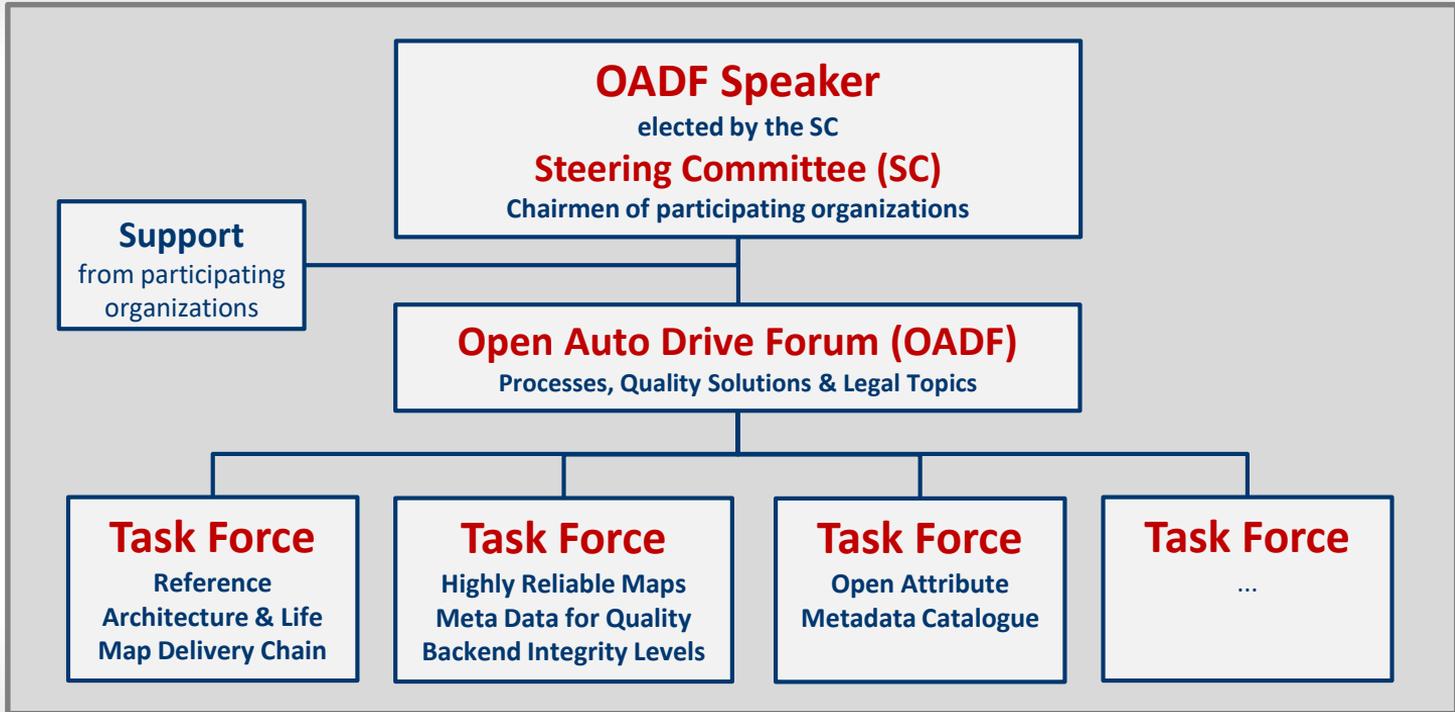




# OADF – work in progress

Andras Csepinszky | TISA BAWG chair & OADF LMDC TF leader  
13 November 2018, Tokyo, Japan



# Architecture TF

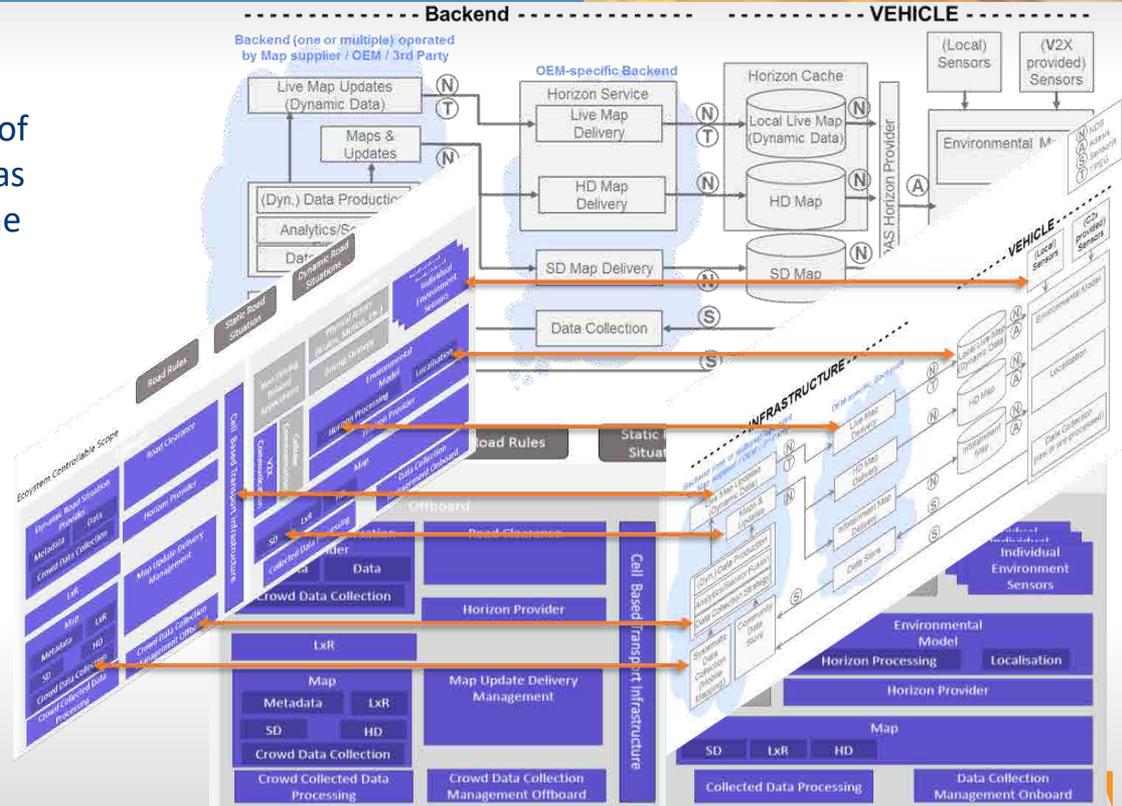
## Reference ecosystem

### Problem statement

- Towards Automated Driving, the roles of different components of a car, as well as the dependencies and interaction of the vehicle with the environment, are changing

### Proposed solution

- A commonly agreed ecosystem was developed, maintained and updated
- Harmonization of the different views based on different requirements



# Live Map Delivery Chain TF

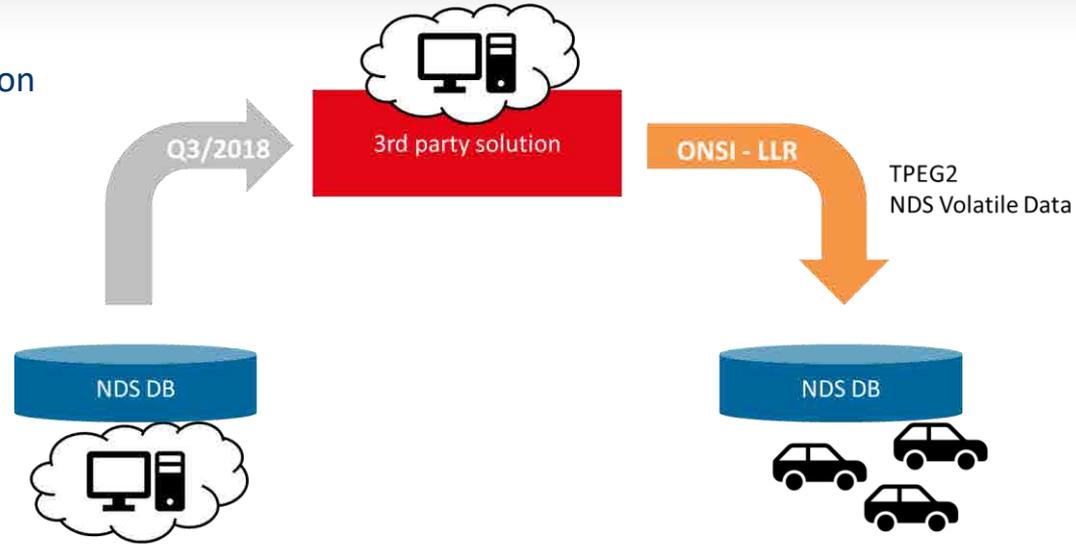
## Location Referencing

### Problem statement

- Used LR methods too resource- demanding on the vehicle side (bandwidth and/or CPU)

### Proposed solution

- NDS link, road classes and decision-points based method
- It is a Path-Referencing mechanism
- It is called now Open NDS Service Interface (ONSI)
- Officially donated by Harman and BMW



# Live Map Delivery Chain TF

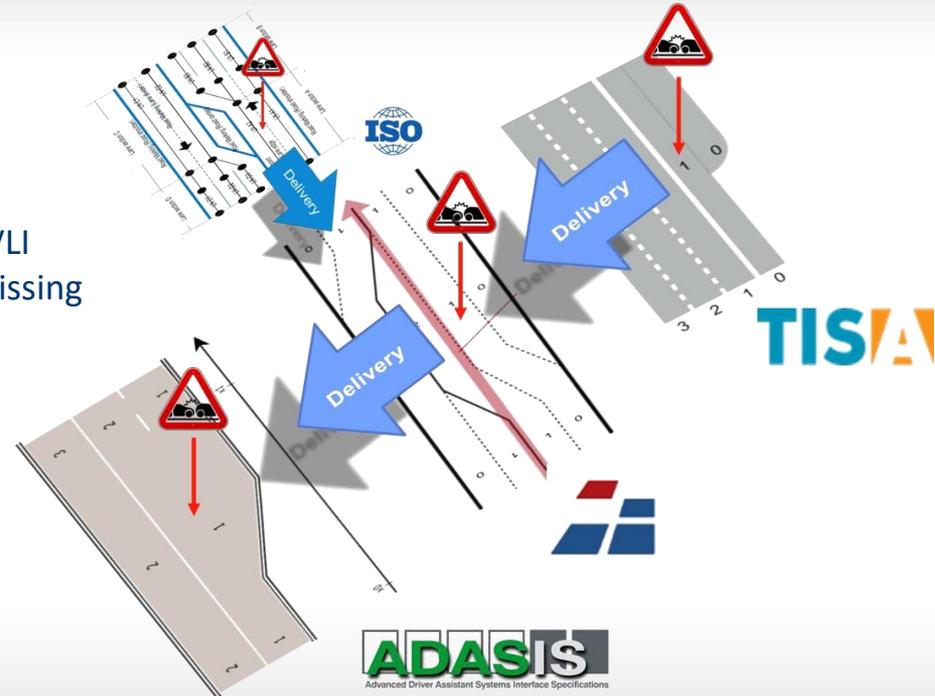
## Lane ID harmonization & compatibility

### Problem statement

- Lane definition, numbering and models are not consistent between standards

### Proposed solution

- TISA eliminates inconsistencies between TEC, TFP & VLI  
→ will use VLI pattern, model for intersections still missing
- TISA and NDS aligned on lane definition and numbering – mapping to NDS map is possible without any known restrictions
- ADASIS is aligned with NDS – lane group concept
- GDF 5.1 model being developed within ISO TC204 – lane belt concept
- Model of SPaT-MAP of SAE J2735 is to be considered  
→ SAE support needed



# Highly Reliable Maps TF

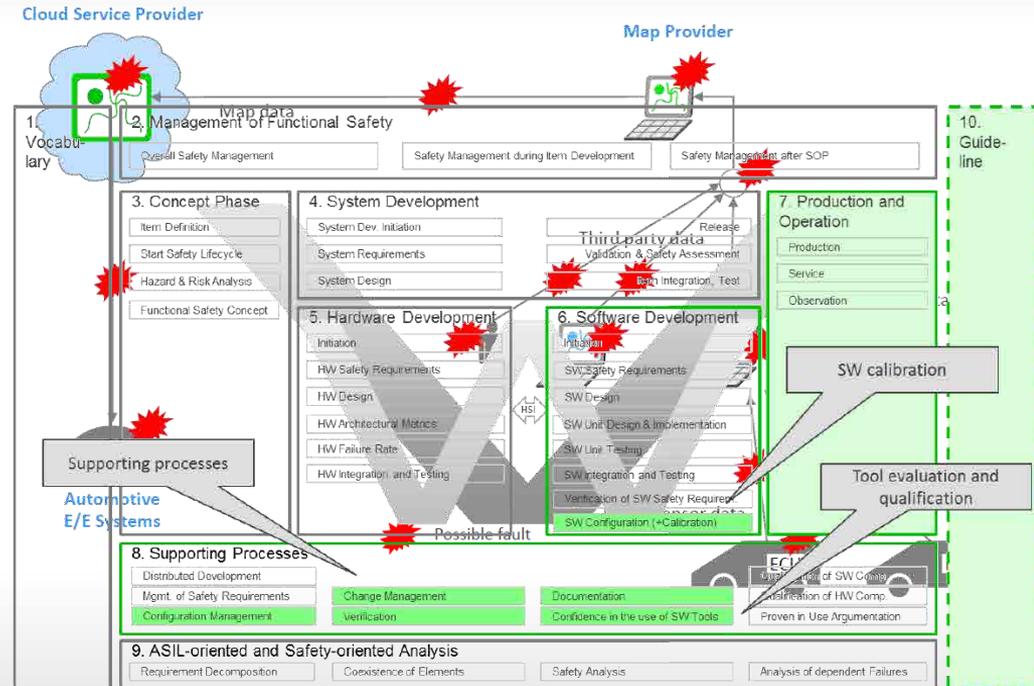
## Map Backend Integrity

### Problem statement

- Reliable maps are essential for highly automated driving

### Proposed solution

- ISO 26262 may be fulfilled by seeing the map backend as a tool
- Map data download by vehicle can be seen as „continuous calibration“ (during drive cycle)
- Differs from ISO 26262, which assumes infrequent calibration data update (production/maintenance)
- Applicable FS requirements for the map backend:
  - Tool evaluation and qualification – confidence in the use of SW tools (ISO 26262-8 Chapter 11)
  - SW calibration – specification and verification (ISO 26262-6 Annex C)
  - Supporting processes – standard QM processes (ISO 26262-8 Chapter 7..10)



# Highly Reliable Maps TF

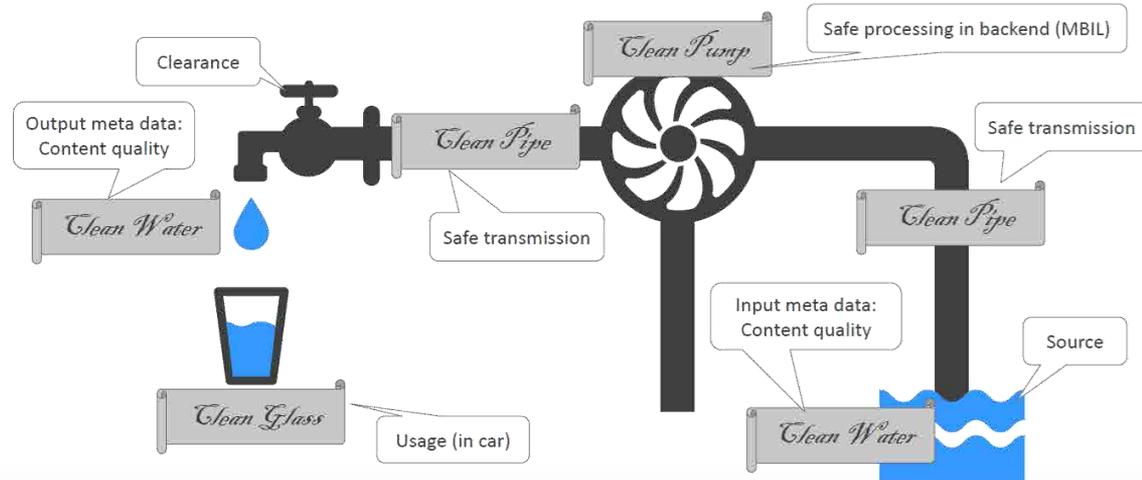
## Map Quality Attributes

### Problem statement

- Reliable Maps are essential for Highly Automated Driving

### Proposed solution

- ISO 19157 can be used to define metadata
- ISO 19157:2013 Geographic information – Data quality
- Data Quality aspects
  - Completeness
  - Logical consistency
  - Positional accuracy
  - Temporal accuracy
  - Thematic accuracy
  - Aggregation measures
- TomTom and HERE Technologies provided information to OEMs about their concepts



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# TISA AD related activities

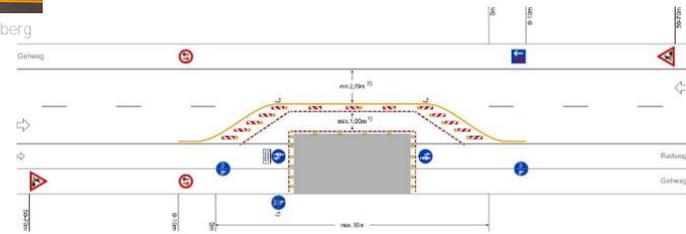
## ■ Restrictions

- AD clearance
- Country-specific driving restrictions



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## ■ Precise Road Work Zones



## ■ Complex geometries

- Toll plaza



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# OADF Contact

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

Irion & Junker Projektmanagement GmbH  
Am Rechentel 17, D-66903 Gries, Germany

Matthias Unbehaun, OADF Speaker, <m.unbehaun@tisa.org>

Marcus Junker, OADF Project Office, <markus.junker@irion-management.com>

<http://openautodrive.org/>