

# Reliable and safe HD maps for automated driving

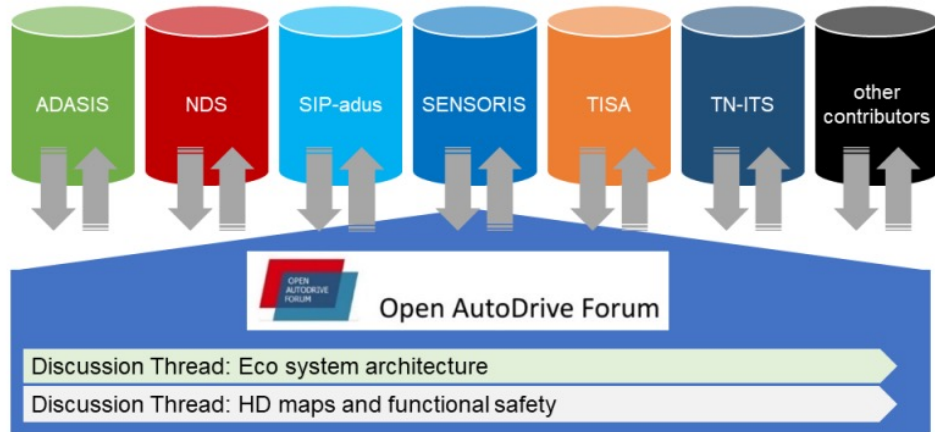


Elektrobit

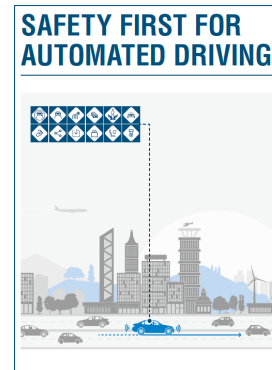
Steffen Kuhn  
Geospatial World Forum 2023  
May 4<sup>th</sup>, 2023

# From OADF workshops to ISO standardization

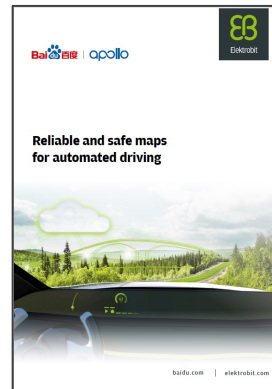
## Workshops



## Publications

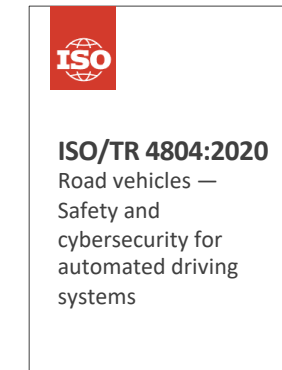


Safety first for automated driving

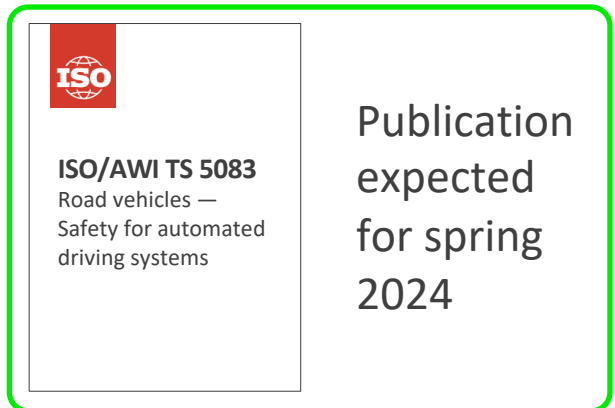


Reliable and safe maps for automated driving

## Standardization



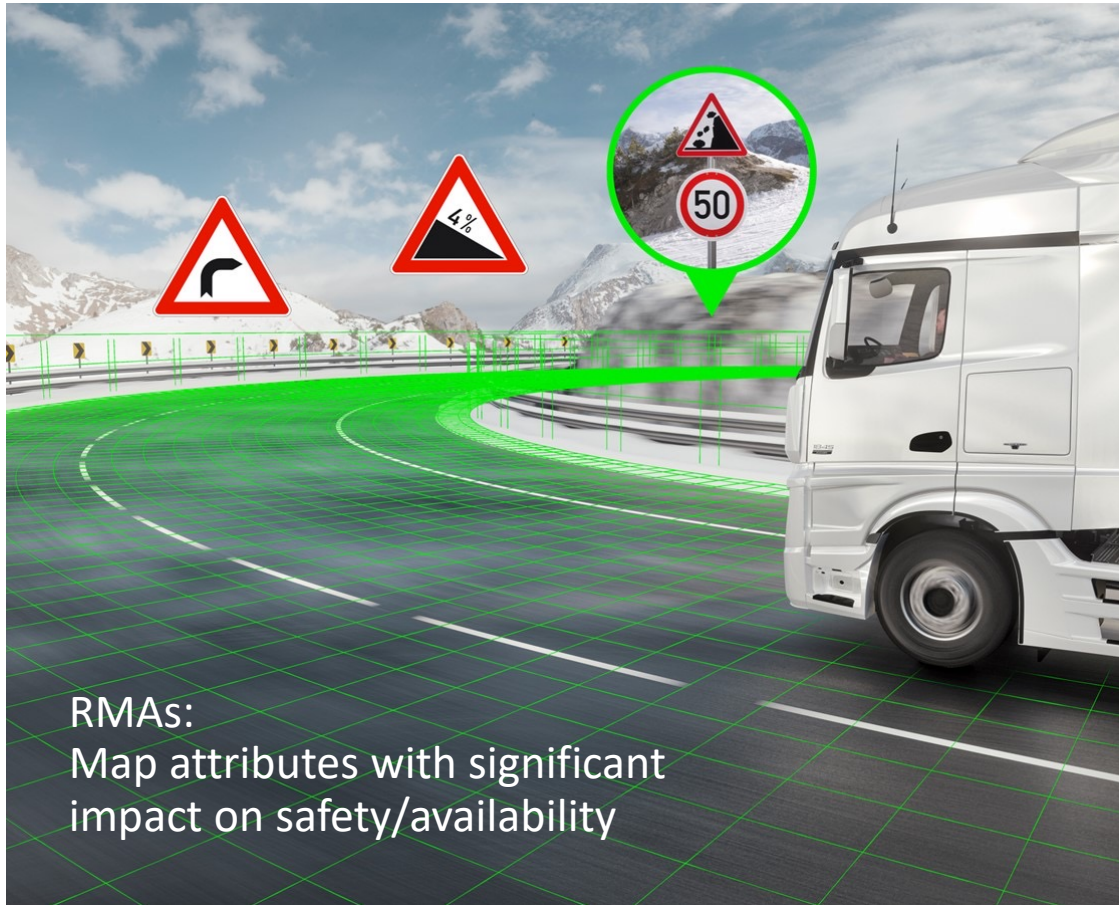
Published



Publication expected for spring 2024



# Structure of the ISO/AWI TS 5083 HD map chapter



## Using HD maps in driving automation systems

- Differences of SD and HD maps
- How HD map data can support safety
- Impact of poor HD map reliability on availability and safety
- Definition of Reliable Map Attributes (RMAs)
- Detectable vs non-detectable attributes
- Selection of RMA sets
- RMA deviation types
- Mitigation of risks from RMA deviations

# Map data can be used to improve ADAS and AD safety

Operational design domain (ODD) limitation



Takeover request in time before end of automated driving area

Support for insufficient sensor performance



Bad weather (snow, ice, fog), country specific signs, physical hacking

Location based information that can not be derived from sensors



Road clearance for automated driving by car manufacturer, country specific rules

Localization



GNSS map matching, landmarks

# Multiple aspects must be considered



Functional Safety  
(ISO 26262)

*Hardware or software  
not working according  
to the specification*



Nominal Performance  
(ISO 21448)

*Insufficient  
performance of  
sensors / algorithms /  
actuators*



Cyber Security  
(ISO/SAE 21434)

*Unauthorized access or  
attack*



Safety in Use  
(ISO 21448)

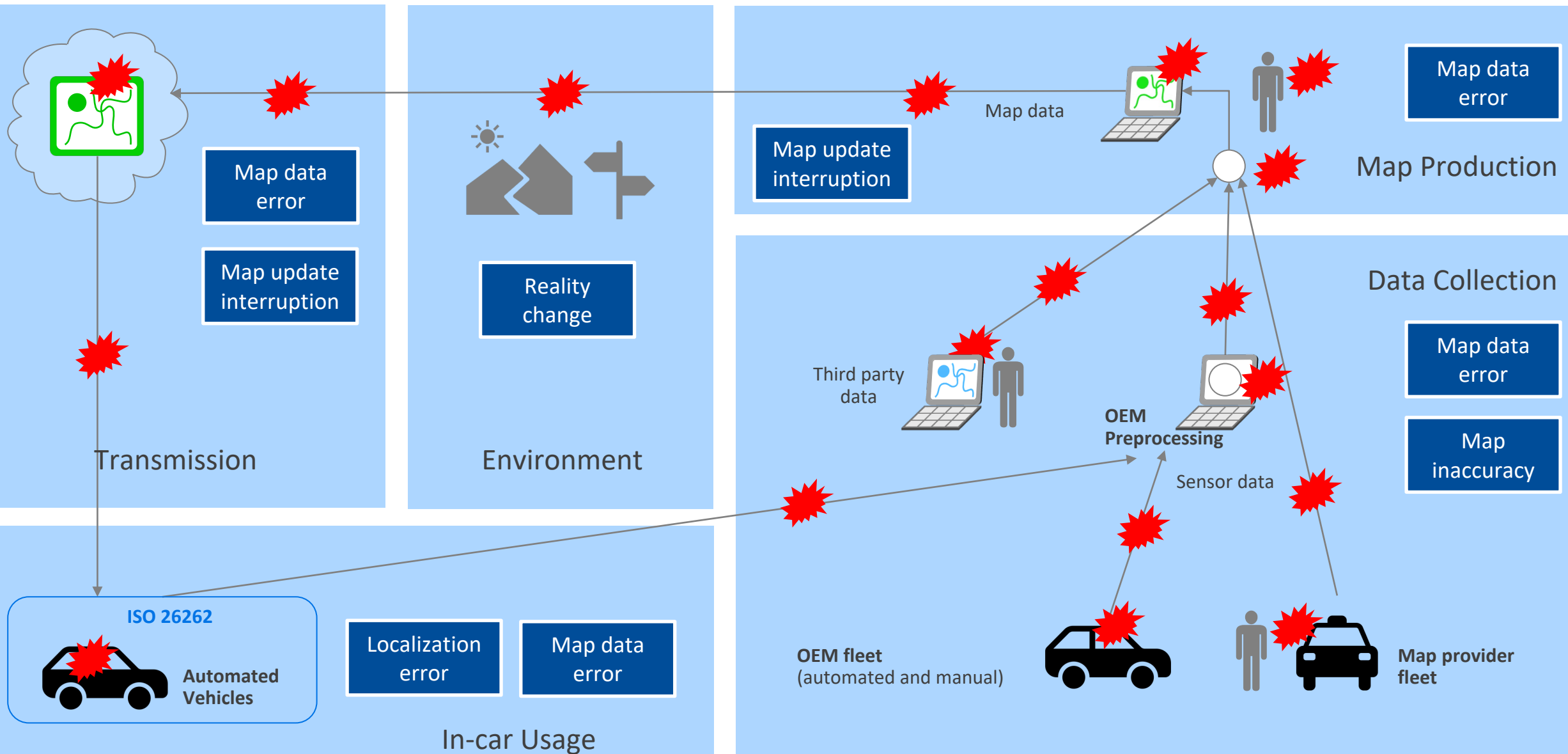
*Hazardous misuse /  
misunderstanding,  
mental overload*



Active/Passive Safety

*Accidents not caused  
by the ego-vehicle  
systems*

# Potential origins of map-reality deviations





# RMA deviation types





Contact us



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