# **ASAM OpenODD Concept Release**

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Association for Standardization of Automation and Measuring Systems

#### Agenda

OpenODD Concept Release Notes

1	Motivation
2	About OpenODD: scope and objectives
3	Deliverables
4	Reference to other Standards
5	Next steps



## **ASAM OpenODD Motivation**



**Some Challenges for CAVs** 

# **11 Billion** miles<sup>1</sup>

To demonstrate with 95% confidence that AVs are 20% better than human drivers



## **Some Challenges for CAVs**

#### **11 Billion miles<sup>1</sup>**

To demonstrate with 95% confidence that AVs are 20% better than human drivers

# 100,000 lives<sup>2</sup>

Saved (in the next 30 years) if AVs which are 10% better than human drivers are introduced



## Why is ODD important?

Number of miles driven?

Types of scenarios experienced?







### Why is ODD important?







## **Scenario mapping to ODD**





## ASAM OpenODD Scope and Objectives



### **ASAM OpenODD: Scope and Objectives**

The aim is to provide a format that is capable of representing a defined Operational Design Domain for connected automated vehicles (CAV) for *simulation based testing*.



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#### **ASAM OpenODD: Scope and Objectives**





## **ASAM OpenODD work packages**

Four work packages

- Work Package 1: Attributes:
  - Ensure alignment with BSI PAS 1883, ISO 34503, and the ongoing ASAM OpenXOntology Project

#### ■ Work Package 2: Specification/format

- Describe the semantic and syntactic description of the ODD description for format for simulation execution
- Work Package 3: Metrics / Measurement
  - Define and describes Metrics associated with ODD
- Work Package 4: Uncertainty
  - Define and describes uncertainty attributes associated with ODD



## **ASAM OpenODD: workflow**





## **ASAM OpenODD: Requirement & Syntax illustration**

#### **REQUIREMENT: Human and machine readability**

#### **Example Use case:**

An example ODD states that motorway is only suitable when there is no rain, up slope is not suitable as the vertical geometry.

#### Syntax 1

keep(road\_type == motorway => odd\_5.weather.rain == none)
keep(geometry.vertical != up\_slope)

#### Syntax 2

SUITABLE Motorway EXCEPT WHEN Rain UNSUITABLE Up\_slope



#### **Deliverables OpenODD Concept project.**

What Is Being Released

#### **Concept Paper**

- Documentation
- Illustration in 2 example syntaxes



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#### 1. Foreword

Association for Standardization of Automation and Measuring Systems (ASAM) is a non-profit organization that promotes standardization for tool chains in automotive development and testing. Our members are international car manufacturers, suppliers, tool vendors, engineering service providers and research institutes. ASAM standards are developed in work groups, composed of experts from our member companies. Our standards enable easy exchange of data or tools within a tool chain. ASAM is the legal owner of these standards and responsible for their development, maintenance, distribution and marketing.

ASAM standards focus on defining data models, file formats, communication APIs, software component APIs, and communication protocols for the data exchange between research, development, and validation systems. ASAM standardization seeks to incorporate requirements from many different global viewpoints and produce an efficient interface.



#### **Other standardization activities**

- Need for common understanding
- Need for collaboration
- Crowded landscape

#### **Major activities**

- BSI (UK): PAS 1883: ODD Taxonomy
- SAE: ORAD, AVSC: ODD Lexicon
- ISO: ISO 34503: ODD Taxonomy and definition format
- ASAM: OpenODD: simulation level ODD definition

bsi.





## ASAM OpenODD Next steps



## **ASAM OpenODD: Next steps**

ASAM OpenX Harmonization planning

■ ASAM OpenODD Standardisation project – March 2022



#### Thank you for your attention!

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