

# Welcome to **SUNRISE Webinar**



## Requirements for CCAM safety assessment data framework content

7<sup>th</sup> March 2024  
13:00-14:00 CET



Funded by  
the European Union

## Agenda

- SUNRISE project introduction
- Content harmonisation of scenario data framework
- Requirements for CCAM safety assessment data framework content
- Q&A



Sjef van Montfort  
TNO



Fadi Alakkad  
University of Warwick



SAFETY ASSURANCE FRAMEWORK FOR CONNECTED, AUTOMATED MOBILITY SYSTEMS

# SUNRISE project introduction

7<sup>th</sup> March 2024

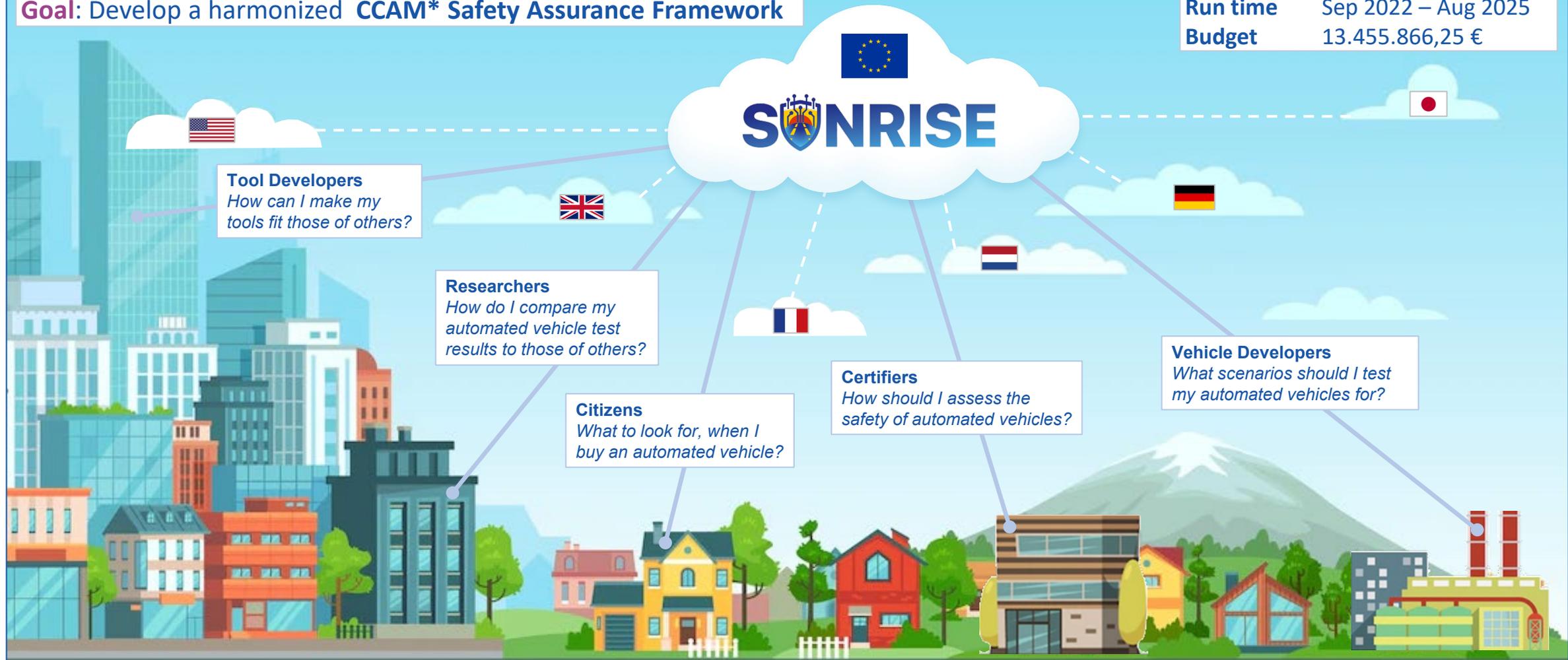
Sjef van Montfort – TNO



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**Goal:** Develop a harmonized **CCAM\*** Safety Assurance Framework

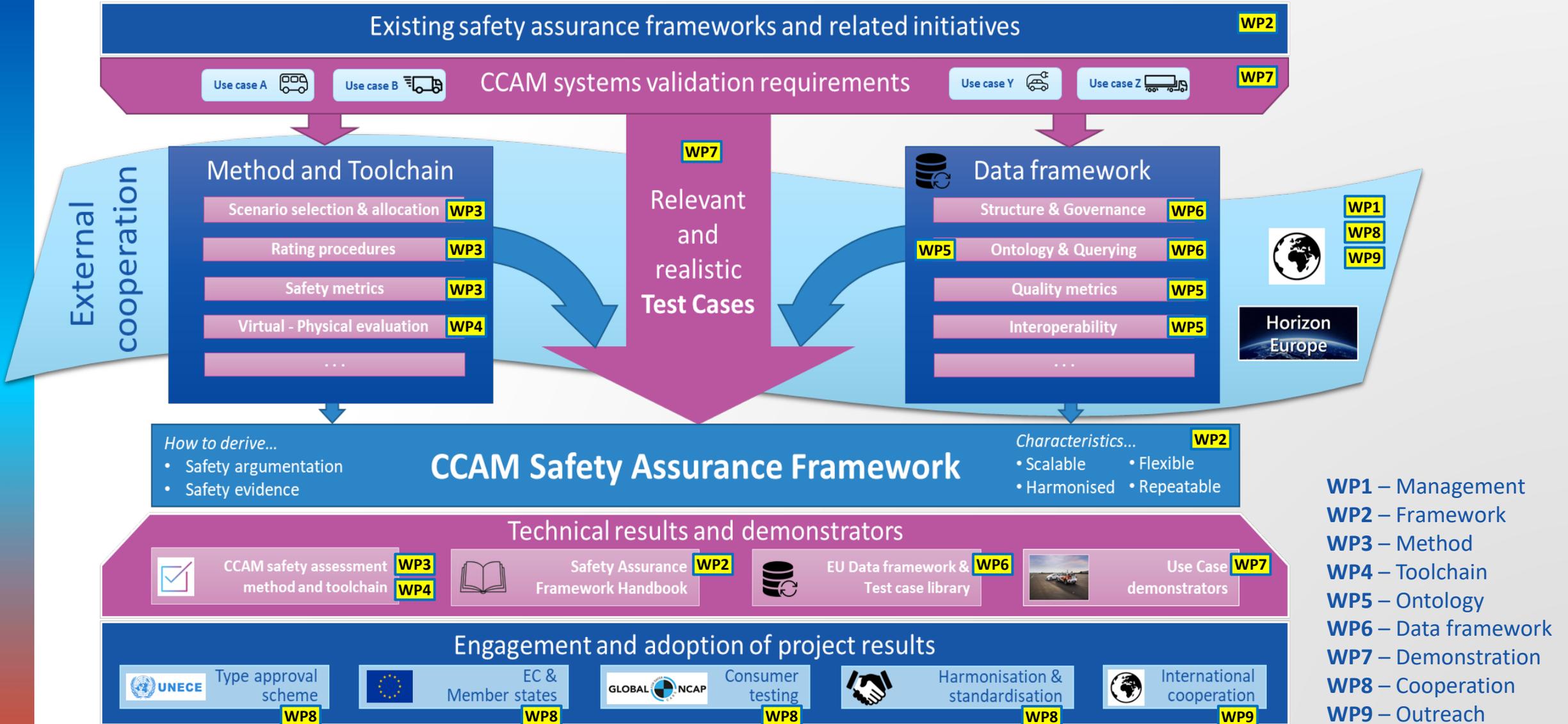
**Run time** Sep 2022 – Aug 2025  
**Budget** 13.455.866,25 €



Safety Assurance Framework for Connected and Automated Mobility Systems



\* CCAM = Connected, Cooperative and Automated Mobility



# Partners

**TNO** innovation  
for life

**SIEMENS**

**WMG**  
THE UNIVERSITY OF WARWICK

**ERTICO**  
ITS EUROPE

**TOYOTA**

TOYOTA MOTOR EUROPE

INSTITUT  
**VEDECOM**  
DU VÉHICULE DÉCARBONÉ ET  
COMMUNICANT ET DE SA MOBILITÉ

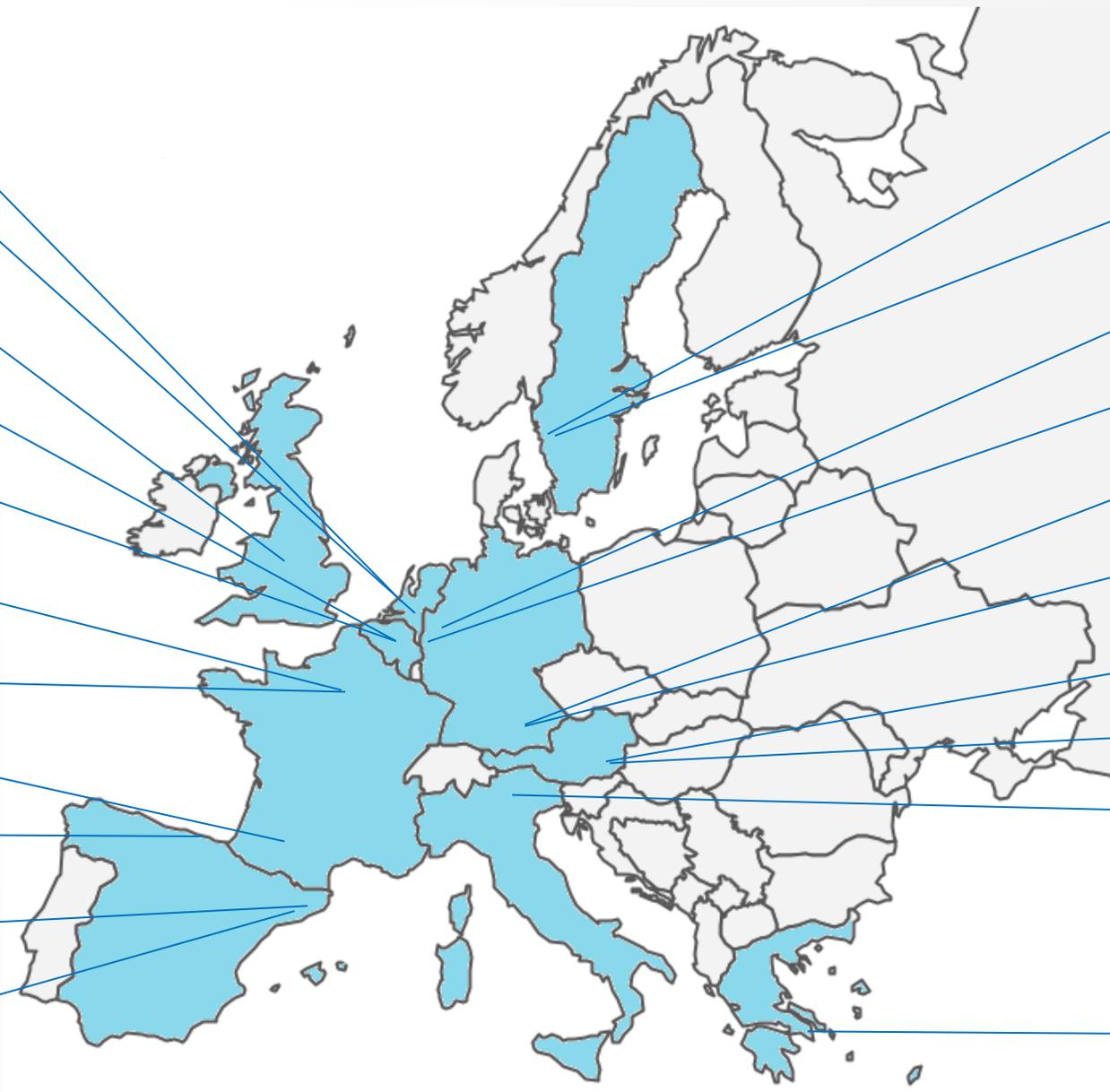
**GROUPE  
RENAULT**

**Continental**

**vicomtech**  
your R&D partner for smart digital solutions

**CVC**  
Centre de Visió per Computador

**Applus<sup>+</sup>  
IDIADA**



**SUNRISE**

**CHALMERS**  
UNIVERSITY OF TECHNOLOGY

**RISE**

**bast**

**ika** | **RWTH AACHEN  
UNIVERSITY**

**deapen**

**infineon**

**AVL**

**virtual vehicle**

**UNIVERSITÀ  
DI TRENTO**

**ETIEX  
IGCS**



*SUNRISE team members  
General Assembly Athens Sep 2023*

# Content harmonisation of scenario data framework

**Work Package 5**

7<sup>th</sup> March 2024

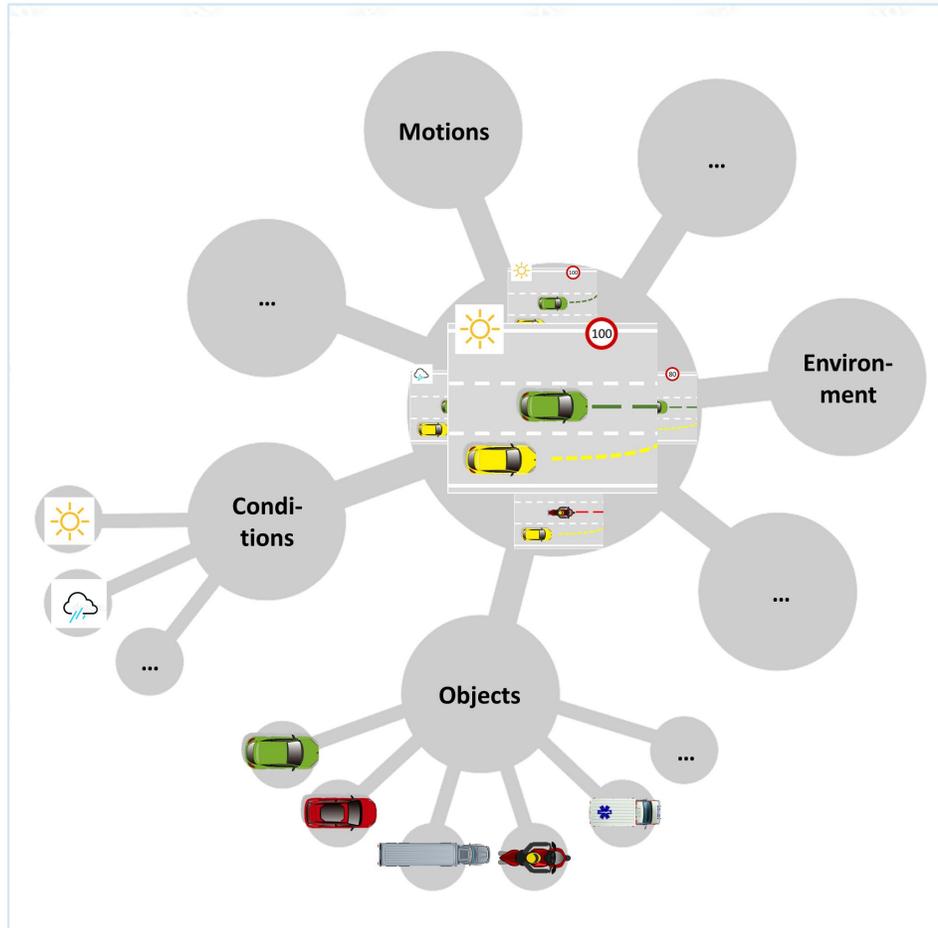
Sjef van Montfort – TNO



# Work Package descriptions

## WP5 – Ontology

Full title: Content harmonisation of scenario data framework



## Objectives

1. **Describe** harmonised **properties** and **features** of SCenario DataBases (**SCDBs**), including scenario description (**ontology**)
2. **Ensure SCDB interoperability** and maximize completeness and accessibility
3. **Develop quality metrics** for SCDB contents
4. **Ensure handling future scenarios** and parameters

# Objectives and achievements

## WP5 – Ontology

### Objectives

1. **Describe** harmonised **properties** and **features** of SCenario DataBases (**SCDBs**), including scenario description (**ontology**)
2. **Ensure** SCDB **interoperability** and maximize completeness and accessibility
3. **Develop** **quality metrics** for SCDB contents
4. **Ensure** **handling future scenarios** and parameters

### Achievements

1. Requirements for Data Framework and SCDB content defined and reported in deliverable D5.1
2. Relevant ontologies identified and overview created. Clusters defined of similar Data Framework components, and contents that need format harmonization.
3. List created with different types of quality metrics for SCDB contents, distinguishing metrics for which definitions already exist, from those for which *new* definitions will be developed.

## WP5 – Ontology

Next steps:

- Harmonisation of data framework and SCDB content (T5.2)
  - Completion literature review on SCDB ontologies
  - Format alignment with WP6 and WP7, incl.:
    - ODD format
    - Test requirement format
    - SCDB Input/Output
    - Scenario format
- Develop quality metrics for SCDB (T5.3)
  - Applicability of existing metrics for SCDB → update of existing metrics
  - Possible new metrics to be defined

Close cooperation with *WP6 Data framework design and usage definition.*

# Collect requirements for data framework and SCDB content

## Task 5.1

7<sup>th</sup> March 2024

Fadi Alakkad – University of Warwick



# SUNRISE Data Framework

*The **SUNRISE Data Framework** is a comprehensive platform designed to enable user access to a wide variety of external scenario databases that are connected to it. Its primary function involves facilitating the **retrieving** and **searching** for scenarios, **validating** scenarios, and **connecting to the testing execution** components of the SAF.*

## D5.1

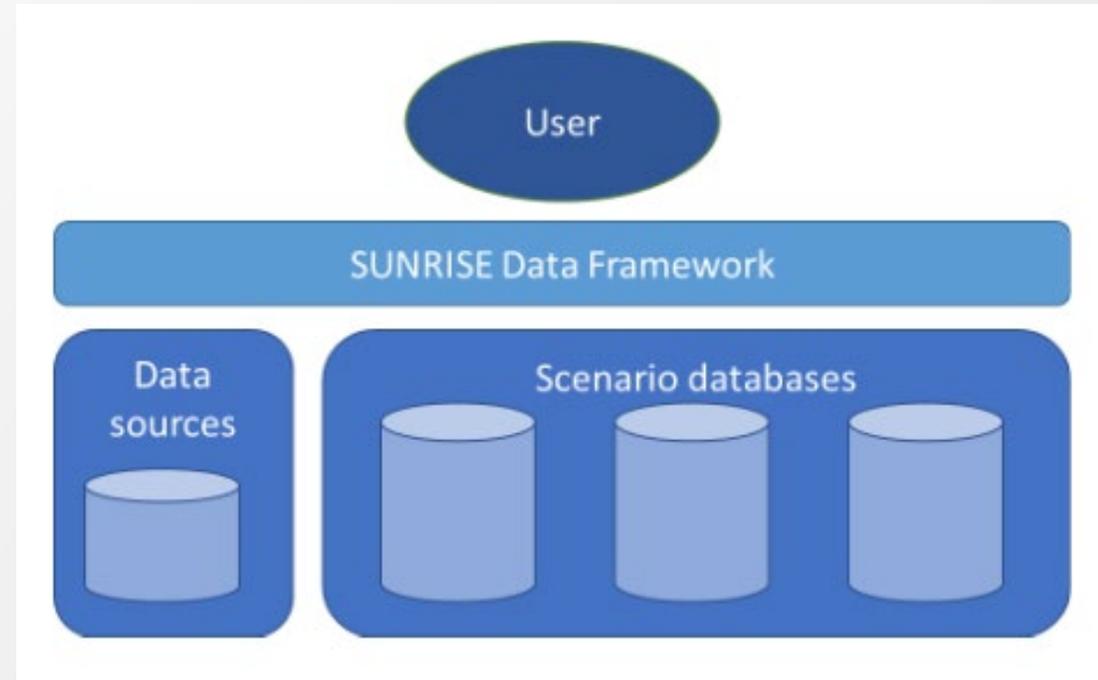
*The deliverable 5.1 aims to present and describe stakeholder-identified requirements for the SUNRISE Data Framework, encompassing federated scenario databases. The document outlines user-friendly functionalities within the data framework, emphasizing activities like scenario retrieving, searching, formatting and test result storage.*

# Approach

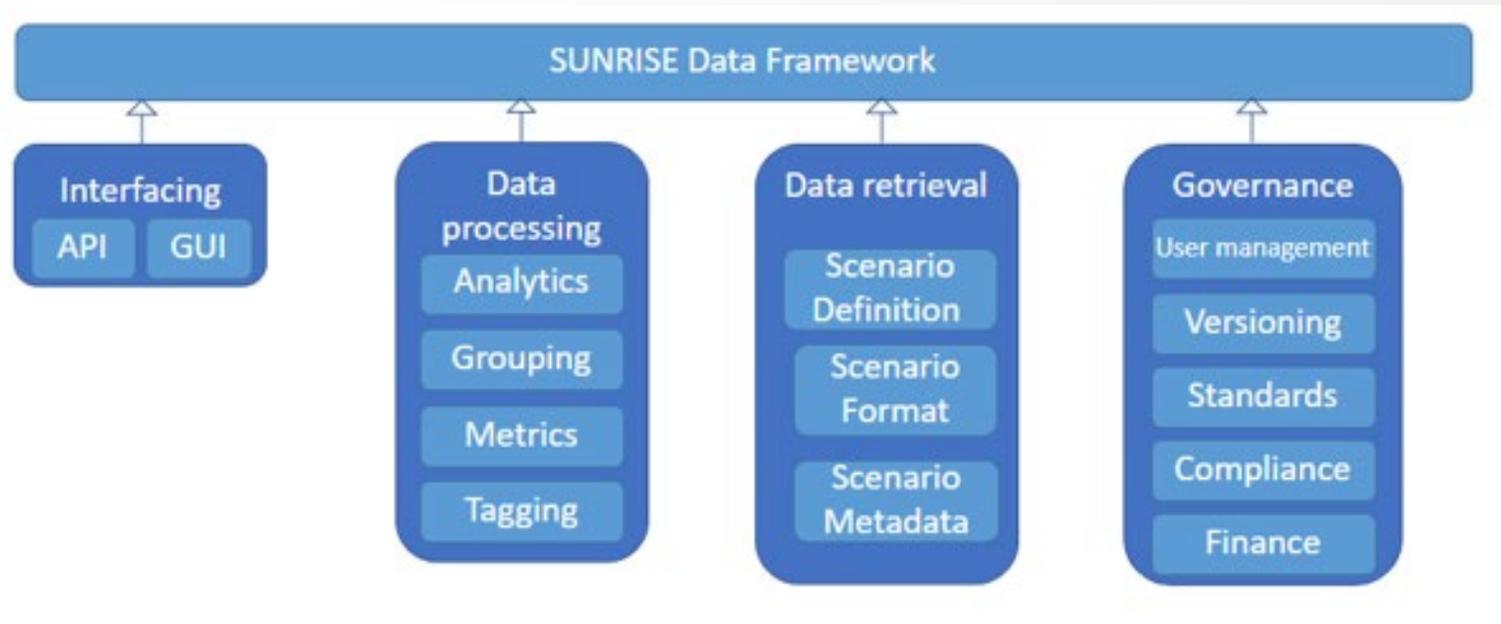


# SUNRISE Data Framework

1. Users **access** scenario databases through the data framework, catering to diverse **roles** within **user organizations**.
2. The data framework **enable** the users to **retrieve scenarios** from **external databases** in the SUNRISE project.
3. Prior to retrieval, **processing** steps are essential to **harmonize scenario data**, performed by individual databases.
4. Various **data sources** may be utilized to **enhance the retrieved results**, contributing to a more **comprehensive dataset**



# Concept of SUNRISE Data Framework Components



**Interfacing** : enables users to request scenarios via the GUI, serving as the interaction point between the data framework and external Scenario Databases (SCDBs) through the API

**Data Processing:** manages scenario grouping and tags based on an agreed taxonomy within the data framework

**Scenario Retrieval:** query the framework for scenario data retrieval, and the system outputs relevant scenarios based on metadata information or scenario labels

**Governance** : defines the maintenance and improvement process for the data framework.

# Clusters

- To help identify and group requirements that share similar characteristics or attributes, the requirements have been grouped into clusters.
- This enables a better understanding of the requirements by highlighting the relationships and patterns among them. The requirements are being collected in the following clusters.

Nr.	Cluster	Description
CL1	User Management	This cluster covers handling user access, managing user accounts, defining roles, and identifying the main users.
CL2	Interfacing	Refers to requirements related to the interaction and exchange of data between the data framework and external scenario databases.
CL3	UI/GUI	Involves requirements related to the visual representation of data and user interaction with the data framework
CL4	Database Data Processing/Analytics	Involves requirements related to functionalities to process, analyse, and manipulate data within the data framework.
CL5	Version Control	Involves requirements related to tracking and managing the versions of scenarios within the data framework.
CL6	File Attachment	Involves requirements related to associate and attach different types of files to scenarios within data framework.
CL7	Structure of Scenario Representation	Involves requirements related to organising and categorising scenarios data framework
CL8	Standards Alignment	Involves requirements related to align the input and output formats with relevant standards.
CL9	Scenario Filtering/Searching	Refers to a set of requirements or functionalities related to searching and filtering scenarios.
CL10	Legal and Compliance	Refers to requirements related to the compliance with legal requirements, and the protection of legal rights and obligations.
CL11	Scenario Metadata Association	Involves requirements that focuses on capturing and associating essential metadata elements with scenarios.
CL12	Scenario Metrics	Involves requirements related to measuring the quality of scenarios within the data framework.
CL13	Scenario Definition and Format	Involves requirements related to the format and structure of scenarios within the data framework.
CL14	Scenario Data Source Categorisation	Involves requirements of the data sources that the data framework.
CL15	Scenario Tagging/Labelling	Involves requirements related to tagging and labelling scenarios within the data framework.
CL16	Test Results	involves requirements related to test results in the data framework.

# Requirements

Cluster	Requirement
Structure of Scenario Representation	The result of a query with the Data Framework shall be reproducible
Scenario Filtering/Searching	The Data Framework shall enable querying similar scenarios from different databases using the same query
Scenario Metadata Association	The data framework shall contain scenario meta information, based on agreed taxonomy (meta data)
Scenario Definition and Format	Scenarios shall contain a human-readable description
Scenario Definition and Format	The input format shall include dynamic objects, map data and weather information and represent changing road network information
Legal and Compliance	The Data Framework shall respect the usage of raw personal information according to national and international privacy laws.

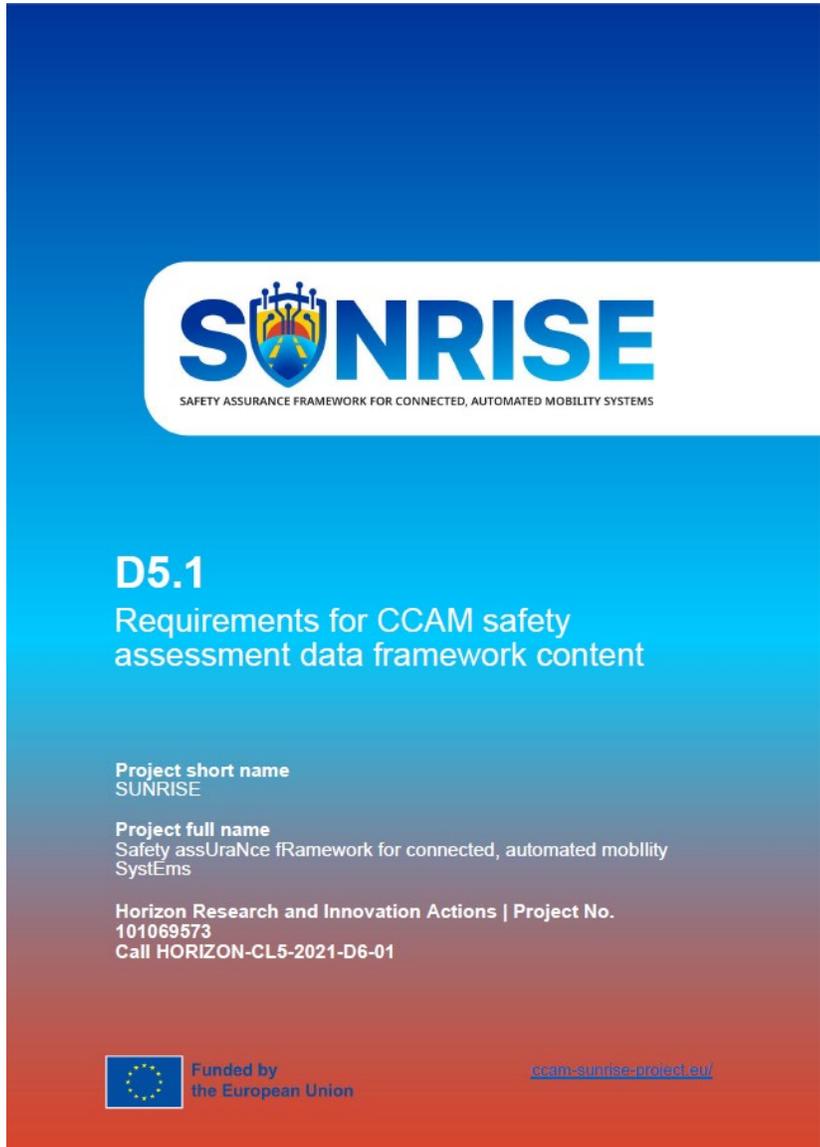
# Conclusion

- The deliverable outlines comprehensive requirements for SUNRISE data framework and federated scenario databases, covering interfacing, searching, presentation, and storing/retrieving of test results.
- Requirements are clustered into 17 themes with unique tags, totalling 74 distinct requirements.
- Requirements gathered through collaborative efforts involving partners from diverse backgrounds, ensuring a comprehensive set for CCAM system safety.

The deliverable is crucial for WP5 and WP6, focusing on data framework harmonization, quality metrics, interface synchronization, and architecture development.

# D5.1

## Requirements for CCAM safety assessment data framework content



The cover page features the SUNRISE logo at the top, followed by the title 'D5.1 Requirements for CCAM safety assessment data framework content'. Below the title, it lists project details: 'Project short name: SUNRISE', 'Project full name: Safety assurance framework for connected, automated mobility systems', and 'Horizon Research and Innovation Actions | Project No. 101069573 | Call HORIZON-CL5-2021-D6-01'. At the bottom, it includes the European Union logo and the text 'Funded by the European Union' along with the URL 'ccam-sunrise-project.eu/'.

- Draft version available on (Pending approval):
- <https://ccam-sunrise-project.eu/deliverable/d5-1-requirements-for-ccam-safety-assessment-data-framework-content/>







**Thank you for your attention!**

**Next webinar:**

28 March 2024

13:00-14:00 CET

*CCAM Use Cases Validation Requirements*