Harmonized CCAM[1] Methodologies

Presented by: Stefan de Vries – Applus IDIADA

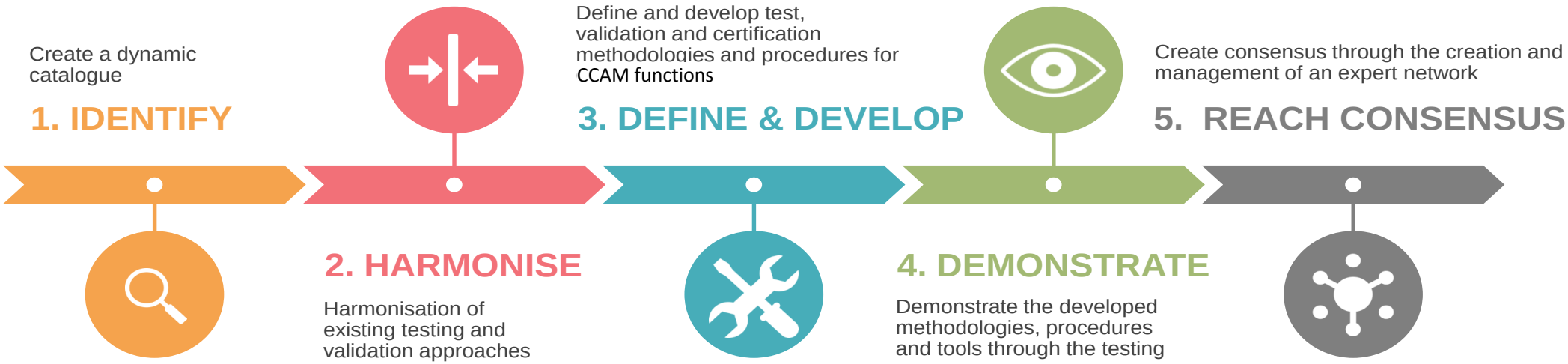
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824309.

1. CCAM = Cooperative Connected Automated Mobility

Project's Objectives

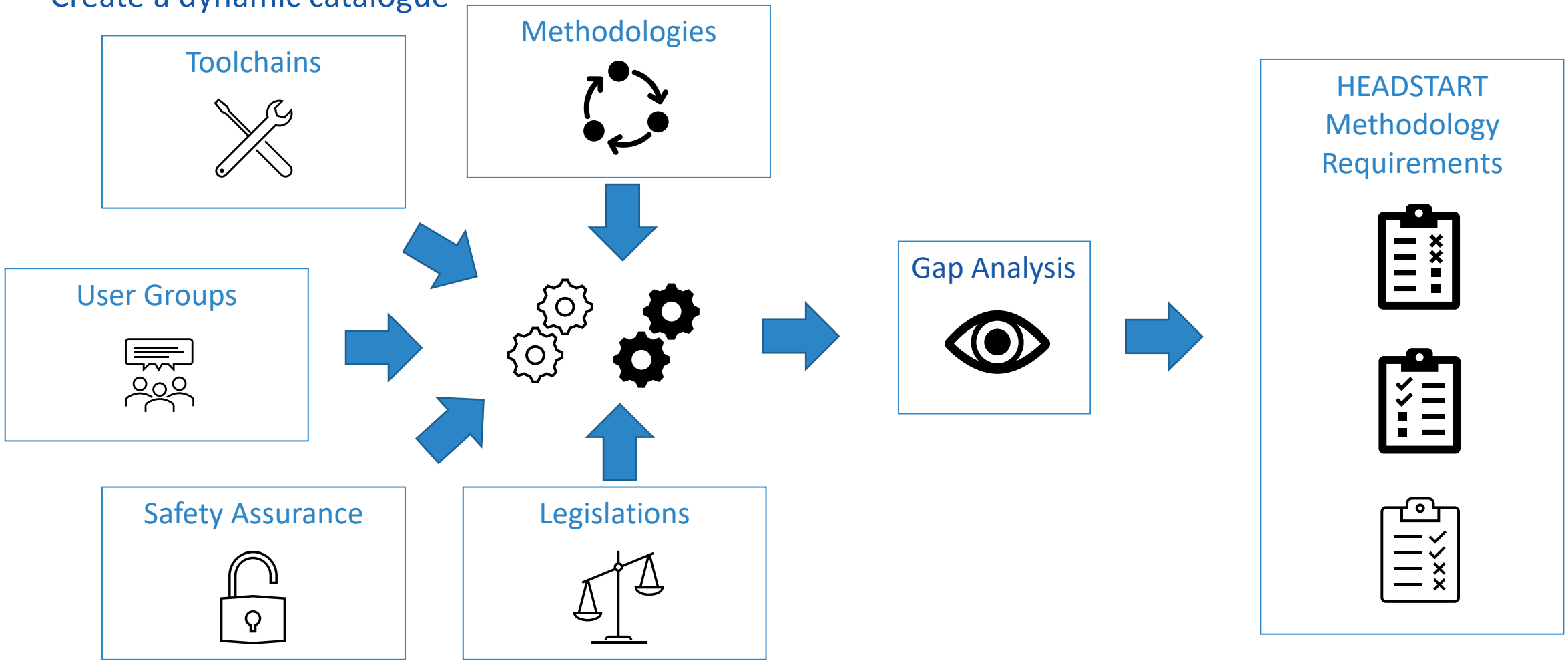
HEADSTART will define **testing and validation procedures of CCAM functions** including:

- its key enabling technologies (i.e. communication, cyber-security, positioning)
- by cross-linking of all test instances such as simulation, proving ground and real world field tests
- to validate safety and security performance according to the needs of key user groups (technology developers, consumer testing and type approval)



1. IDENTIFY

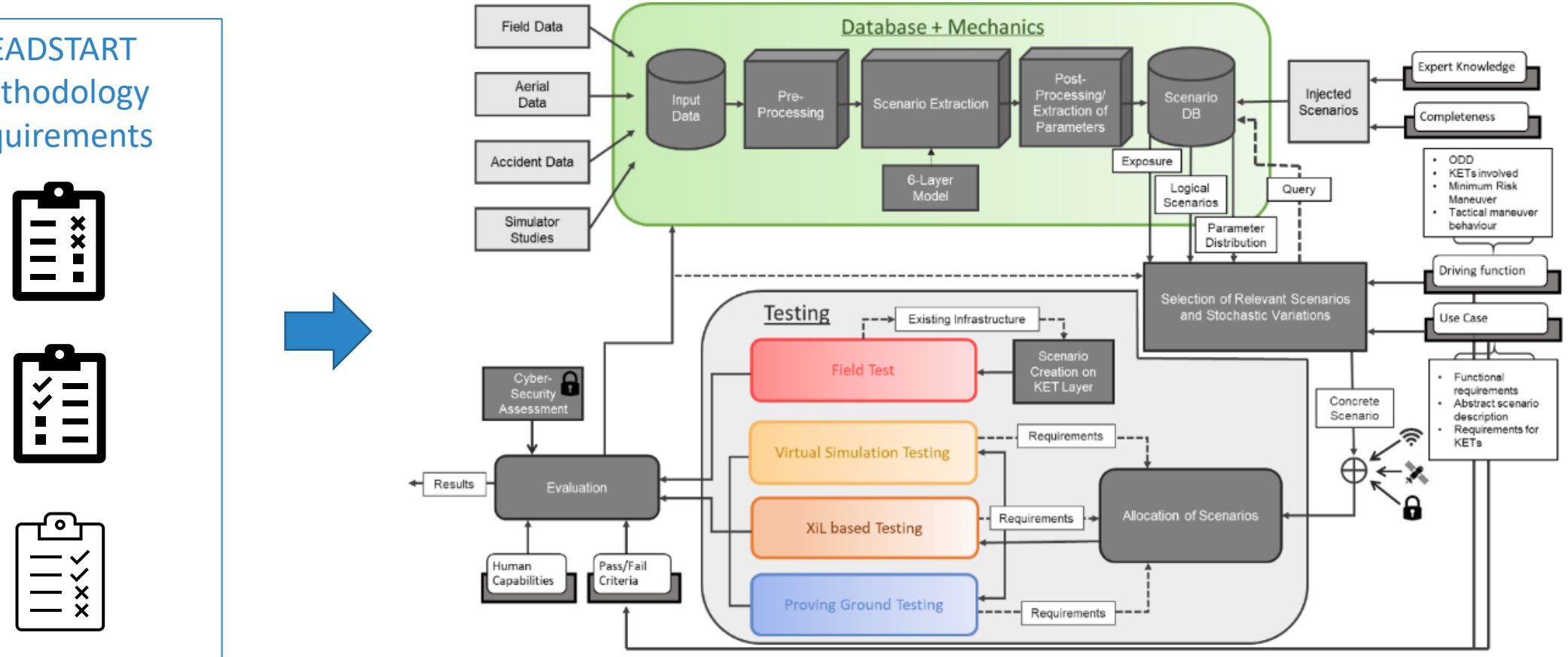
Create a dynamic catalogue



2. Harmonise

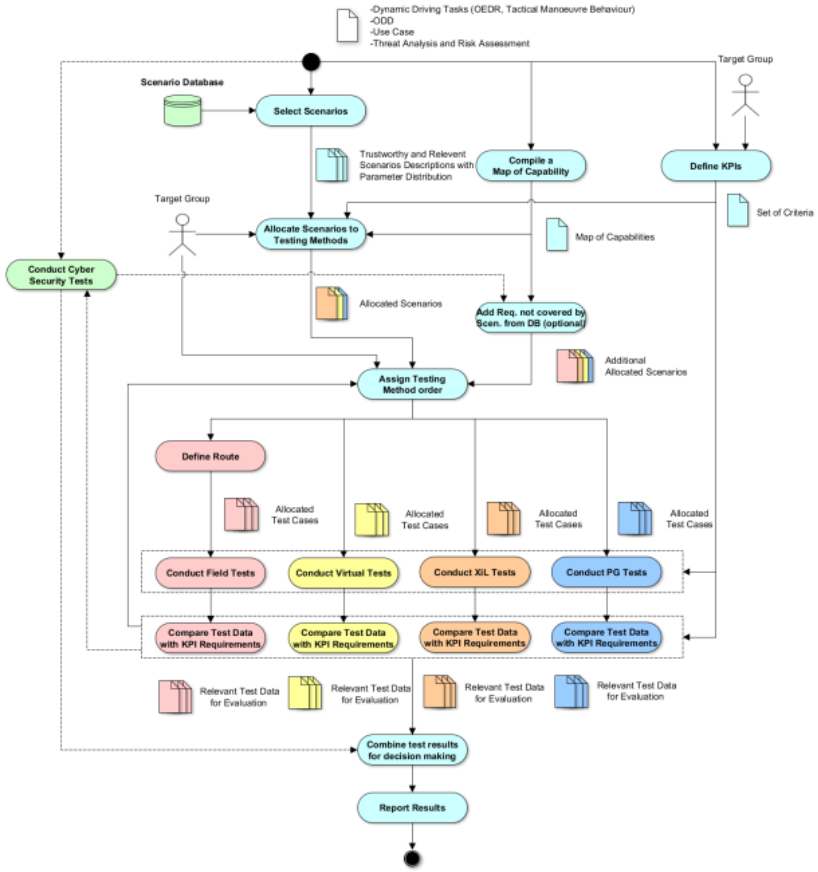
Harmonisation of existing testing and validation approaches

HEADSTART Methodology Requirements



3. Define and develop

Define and develop test, validation and certification methodologies and procedures for CCAM functions.



Truck Platooning

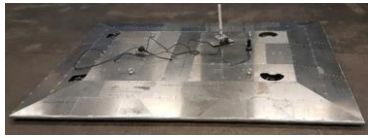
Highway pilot

Traffic Jam Chauffeur

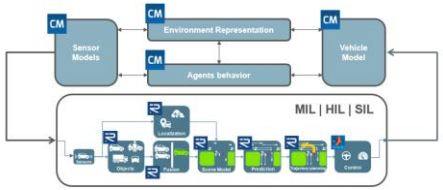
4. Demonstrate

Demonstrate the developed methodologies, procedures and tools through testing.

ENSEMBLE



Linked Projects



5. Reach consensus

Create consensus through the creation and management of an expert network.

Manufacturers associations

- JAMA – Japan Automobile Manufacturers Association, Inc.
- ACEA – European Automobile Manufacturers Association
- PFA – Filière Automobile & Mobilités
- @OICA

Public authorities

- Department of Transportation, United States of America
- National Transport Commission
- UNECE

KETs

- 5GAA Automotive Association
- CAR 2 CAR Communication Consortium

Consumer testing

- Euro NCAP – For Safer Cars

Other relevant initiatives

- M city – University of Michigan
- PEARS – Prospective Effectiveness Assessment for Road Safety
- EATA – European Automotive and Telecom Alliance
- ECSEL JU
- EGVI – European Green Vehicles Initiative
- ADVI – Australia & New Zealand Driverless Vehicle Initiative
- CETRAN
- ERTRAC
- European Truck Platooning
- SIP – 戦略的イノベーション創造プログラム
- American Center for Mobility – Connected. Automated. Validated.
- Nouvelle France Industrielle (NFI)

Learnings

- ✓ Scenario Databases are a key element for CCAM verification and validation but there is still a **lack of harmonization** between different databases.
- ✓ Need for **more harmonization in simulation**.
- ✓ **Lack of compatibility** between physical tooling and simulation tooling.
- ✓ **Role of standards is paramount** in establishing common ground and providing technical guidance.

Conclusions and further work

1. CCAM systems must prove to be reliable in every possible driving scenario, for which a **strong safety argumentation** is needed.
2. **Standardization is in infancy**, as many standards are under development or have been very recently published and still need time to be synchronized and established as a common practice.
3. Instead of many individual silo solutions, a **single concrete approach** should be used in a universally agreed manner, able to deal with a wide variety of scenarios including their creation, editing and parametrization.
4. Therefore, it is necessary to move to the next level of standardization, in the concrete specification and demonstration of a **commonly accepted Safety Assurance Framework** (SAF) for the safety validation of CCAM systems.
5. Future initiatives from the European Commission within the HORIZON 2021 program are moving in this direction and will tackle all these challenges.

SUNRISE

SAFETY ASSURANCE FRAMEWORK FOR CONNECTED, AUTOMATED MOBILITY SYSTEMS

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Main goal

Develop and provide a harmonized and scalable **CCAM Safety Assurance Framework** that fulfils the needs of different automotive stakeholders, for a continuously evolving number of use cases and scenarios.

Key facts

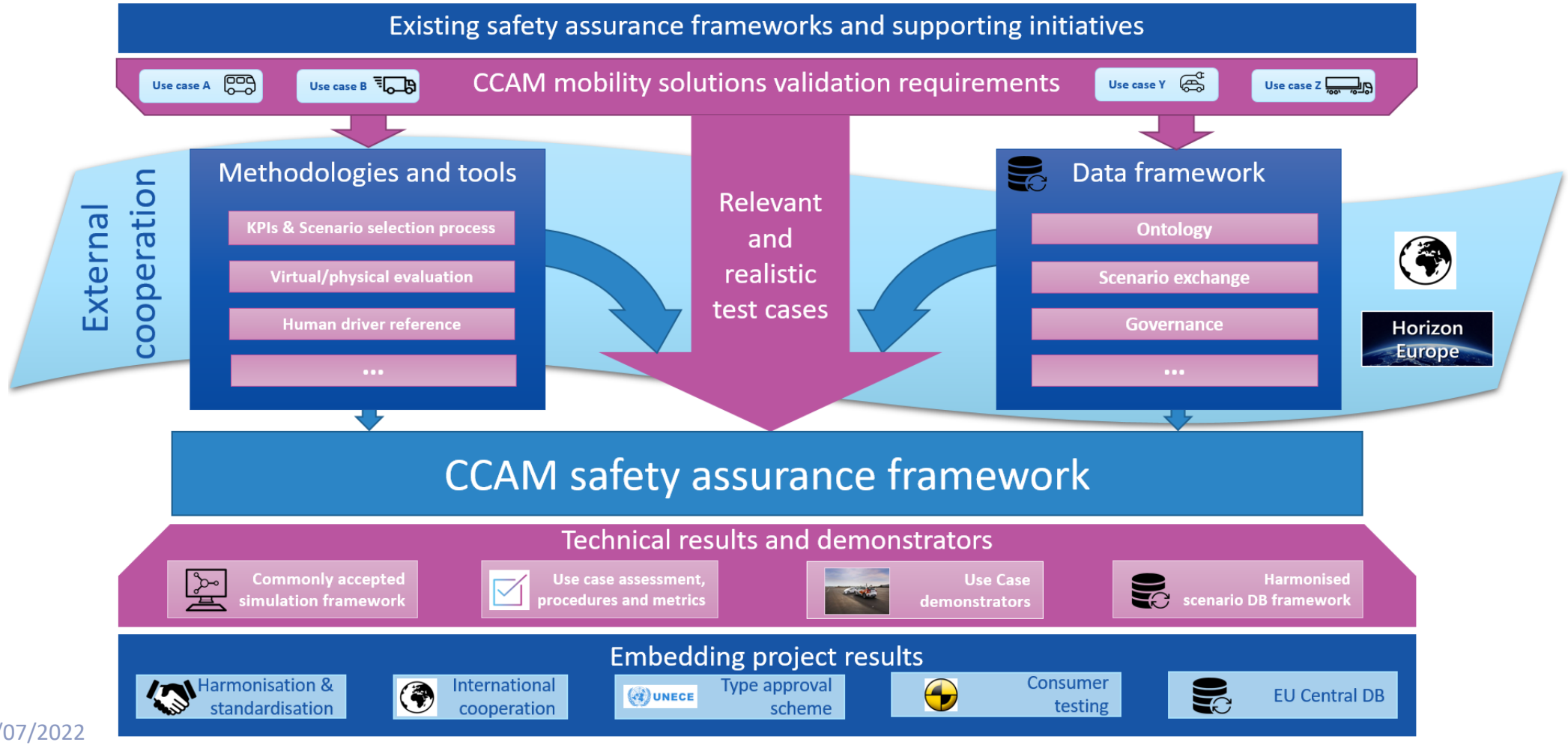
Run time	Sep 2022 – Aug 2025
Budget	15 M€

Key one-liner

"The decade long debate in scenario-based assessment, converges into a common basis."

Safety Assurance Framework

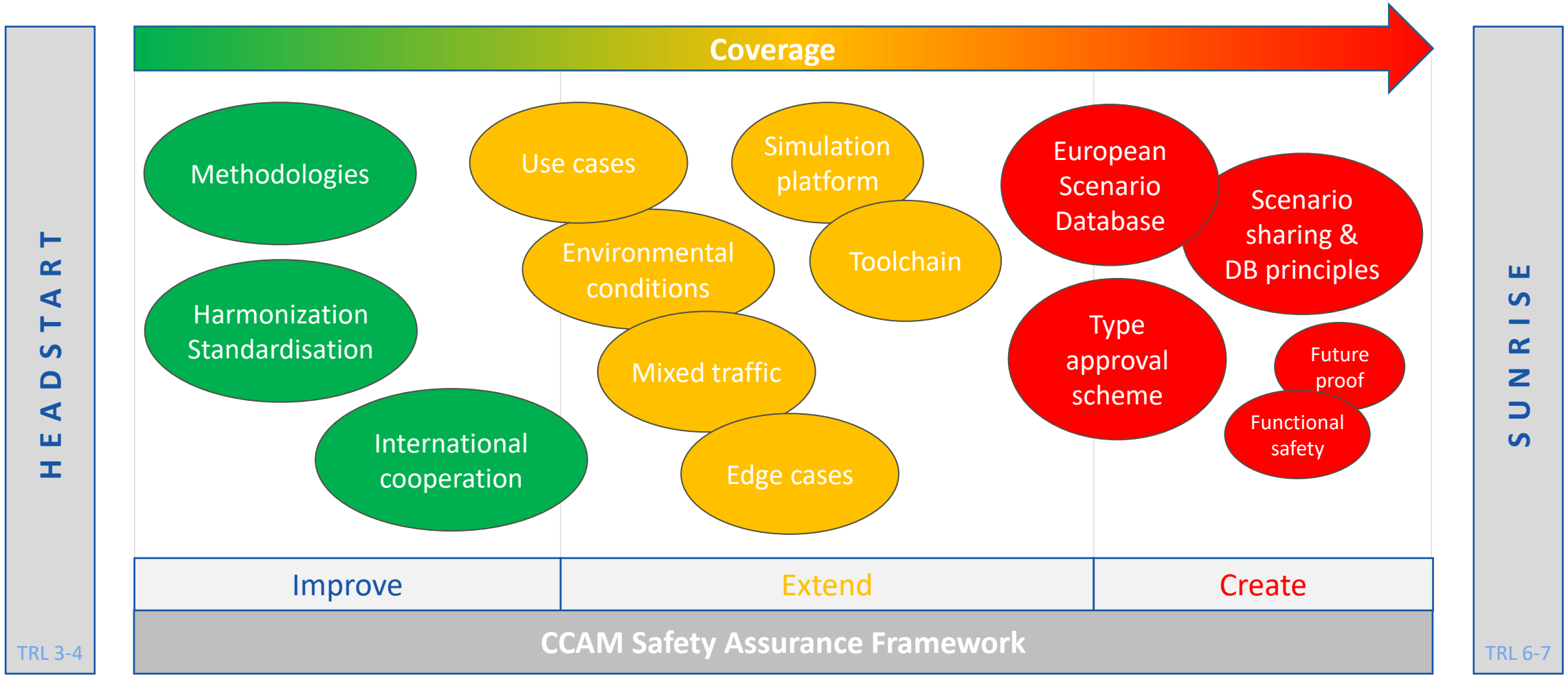
SUNRISE = **S**afety ass**U**ra**N**ce f**R**amework for connected, automated mob**I**lity **S**yst**E**ms



Universal Superglue

- ✓ Sticks your ODD to all the right scenarios
- ✓ Sticks your assessment needs to our methodologies
- ✓ Sticks your analysis results to those of others
- ✓ Sticks your consumer eyes to all relevant selection criteria
- ✓ Sticks your scenario database to our framework
- ✓ Sticks your (software) tools to those of others

What's new?


HEADSTART
TRL 3-4
Coverage
Methodologies
Harmonization Standardisation
International cooperation
Use cases
Environmental conditions
Mixed traffic
Edge cases
Simulation platform
Toolchain
European Scenario Database
Scenario sharing & DB principles
Type approval scheme
Future proof
Functional safety
Improve
Extend
Create
CCAM Safety Assurance Framework
SUNRISE
TRL 6-7

SUNRISE

Partners

Thank you!

Any questions?

Stefan de Vries

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