



Emerging R&I and deployment challenges for CCAM - The EU Perspective



ITU/UNECE Future Networked Car Spin-off
Doha, Qatar - 6 October 2023

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ERTICO Partners 2023



Public Authorities

NATIONAL		REGIONAL	CITY	

Connectivity Industry

Service Providers

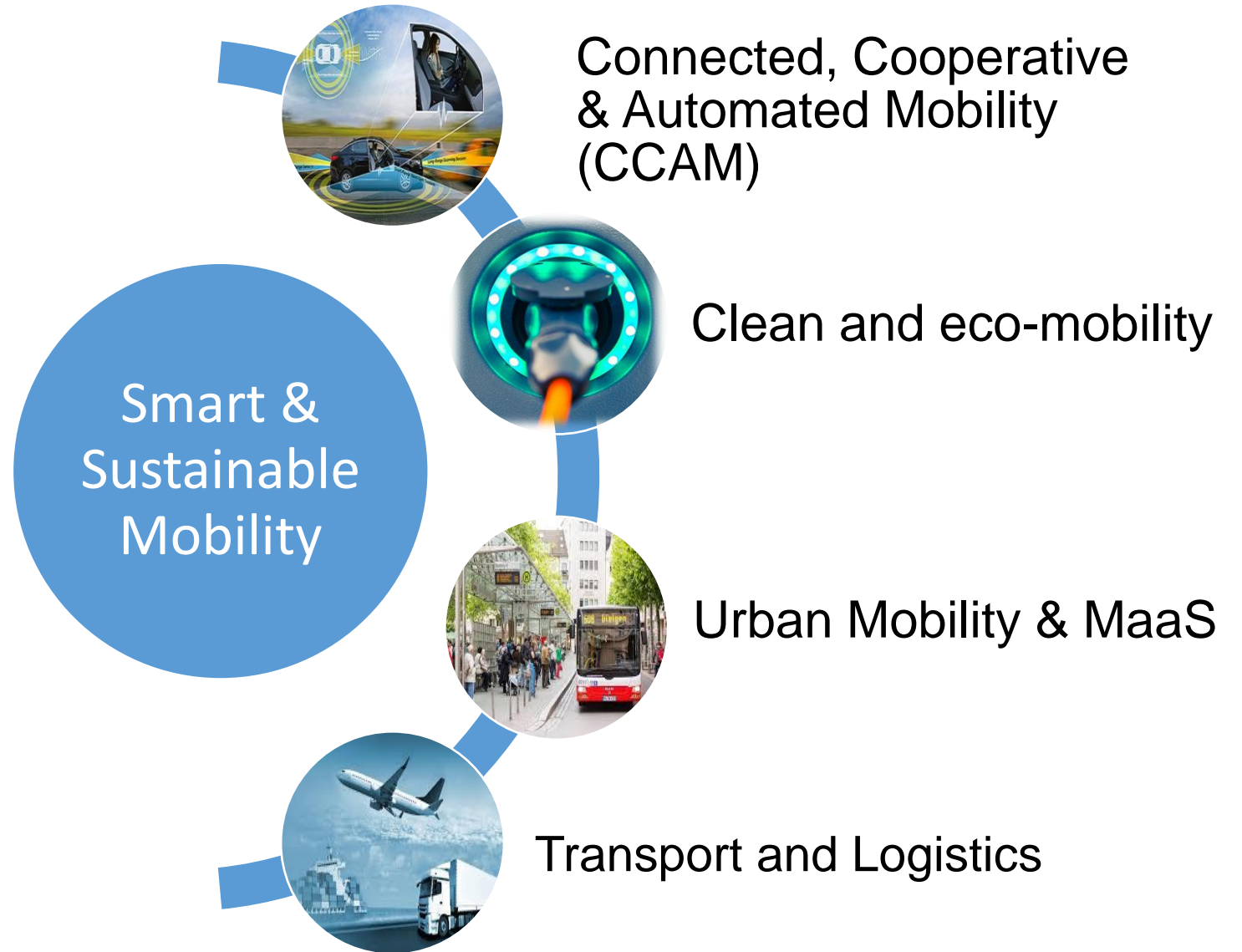
Suppliers

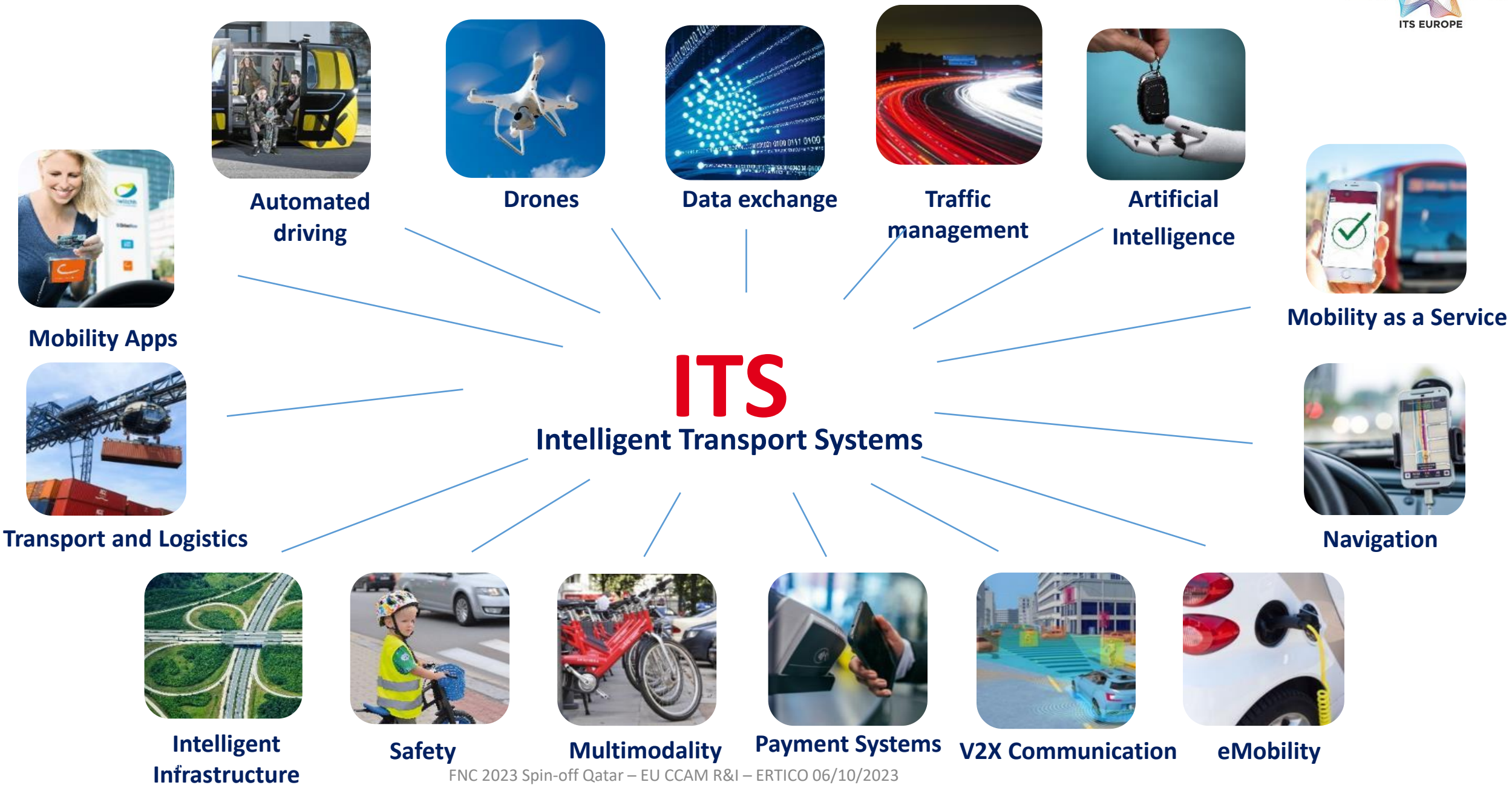
Traffic and transport industry

Users

Vehicle manufacturers

ERTICO Focus Areas





Cooperative, Connected and Automated Mobility (CCAM)



CCAM has the potential to:

- Bring us on the path towards near zero road fatalities (vision zero)
- Increase accessibility of mobility services
- Help reduce harmful emissions from transport by making traffic more efficient

European Commission vision

We want CCAM solutions that

- are fully integrated in the transport system, accompanied by the right support measures by the public sector
- **support new mobility concepts, shifting from a driver-centred to mobility-user oriented approach**

Regulatory context

ITS DIRECTIVE REVISION

Since December 2021

- Make crucial data available to support essential ITS services such as real-time traffic information
- Increase the interoperability and cross-border continuity of ITS applications by expanding to passenger multimodality and automated mobility
- **2030**: large-scale automated mobility
- **2050**: zero fatalities in transport

Scope:

- Availability and accessibility of road, traffic and travel data
- EU wide traffic information and navigation services: RTTi, eCall, C-ITS, SRTI
- EU wide multimodal travel information services (revision of MMTIS and MDMS legislation)

[EU Council and Parliament strike a deal on the roll-out of intelligent transport systems](#)

NEW RULES ON VEHICLE SAFETY AND AUTOMATED MOBILITY

Since July 2022

General Safety Regulation

- **New safety features** required in vehicles
- Intelligent speed assistance, reversing detection with camera/sensors, warning for driver drowsiness, emergency stop signal, lane keeping assistance, advanced emergency braking..

ADS Regulation

- **Type approval for automated mobility**
- Automated driving permitted in defined areas ([e.g.](#) motorways: 60 km/h, up to 130km/h from January 2023)
- Limit on size and vehicle series to max. 1500 vehicles per model/ year (review in 2024)

- Maturity of technology
 - Data recording
 - Cybersecurity measures

[Commission Implementing Regulation \(EU\) 2022/1426 of 5 August 2022](#)

European Partnership on CCAM

Ambition:

- Accelerate through research the deployment of innovative CCAM systems and services for passengers and goods

European Partnership objectives:

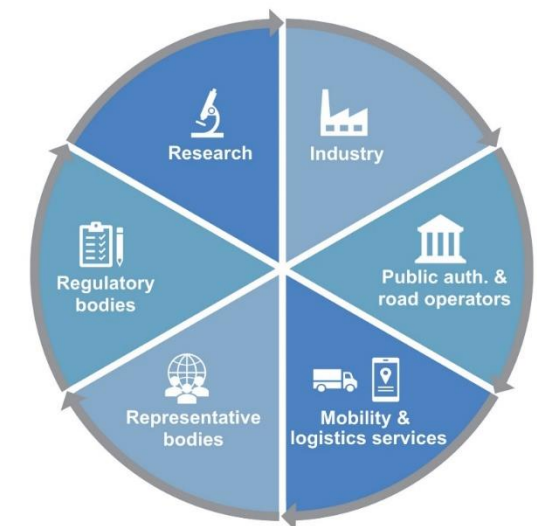
- Better align EU R&I efforts in the field of CCAM
- Develop and implement a coherent long-term agenda to coordinate investments in R&I and pre-deployment
- Implement large-scale demonstrations of inclusive and user-oriented CCAM solutions for people and goods across Europe by 2030.

Budget: 1 Billion € (500 M€ EC contribution)

State of play:

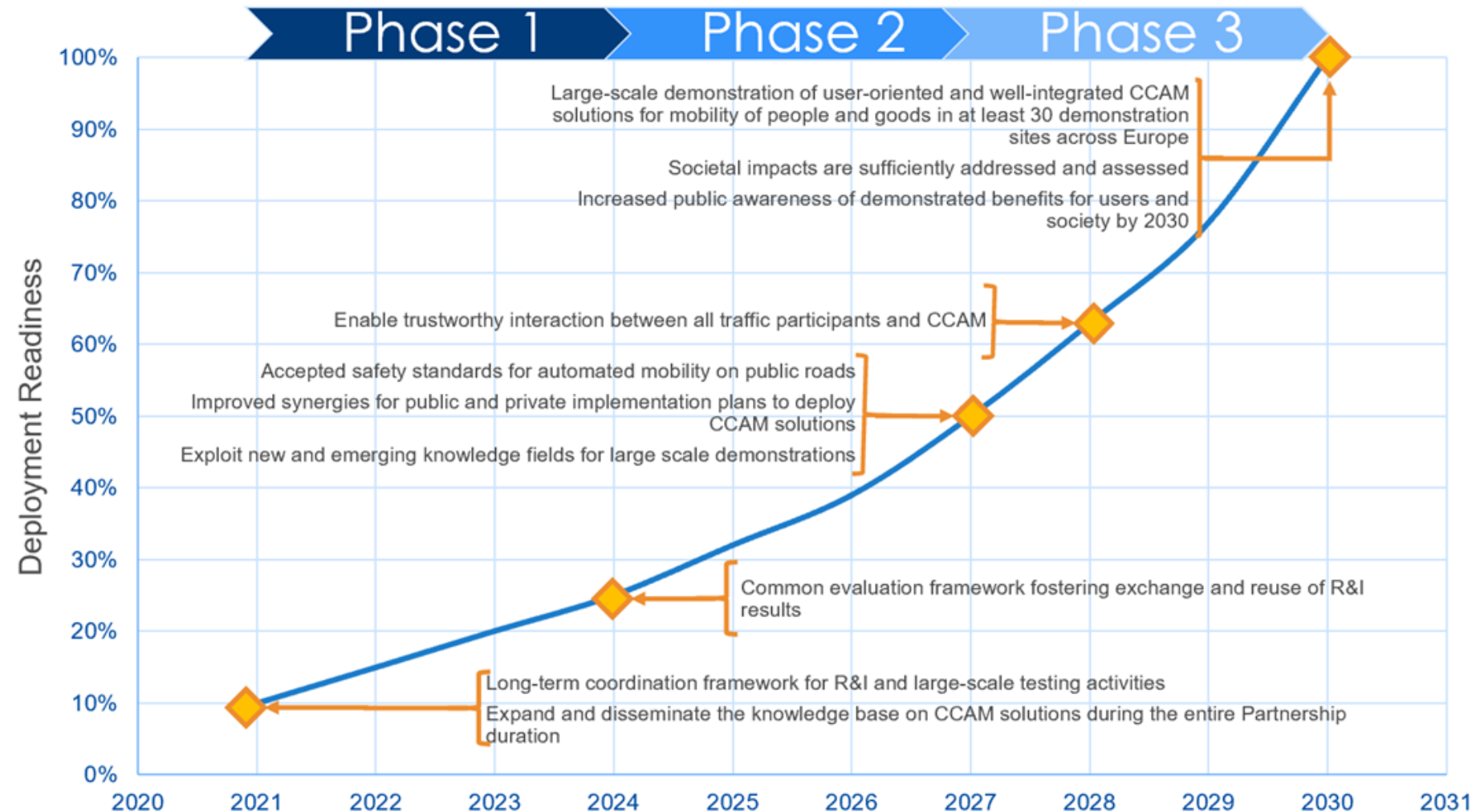
- Strategic Research and Innovation Agenda (SRIA) updated;
- Projects resulting from first HE Calls started in 2022;
- Calls 2023 closed in September

> 200 member
companies /
organisations



Planning for CCAM implementation 2021-2030

- ❑ Phase 1 – Developing the building blocks
- ❑ Phase 2 – Advancing technical maturity
- ❑ Phase 3 – Trials and living labs all over Europe



R&I Priorities and emerging needs

Vehicle Technologies



- Robust and accurate environment perception
- Safe and reliable on-board decision-making technologies
- Preventive and protective safety
- User centric development and HMI to enhance acceptance and trust



Centralized, reliable, cyber-secure & upgradable in-vehicle electronic control architectures for CCAM connected to the cloud-edge continuum.

Validation



- Future-proof common methodologies and tools for validation
- EU wide database of relevant scenarios for validation
- Human Reference for Automated Driving
- HMI testing and validation procedures



- **Generation of scenarios** for development, training, virtual testing and validation of CCAM systems
- Scenario-based safety assurance of CCAM and related HMI **in a dynamically evolving transport system**

R&I Priorities and emerging needs

Integrating CCAM in the Transport System



- Physical and Digital Infrastructure (PDI)
- Connectivity and Cooperative Systems
- Fleet and traffic management in a CCAM eco-system



<https://augmentedccam.com/>



<https://podium-project.eu/>



<https://conductor-project.eu/>



<https://in2ccam.eu/>

- **Orchestration of heterogeneous actors in mixed traffic within the CCAM ecosystem.**
System approach towards traffic management that integrates the operations and needs of a wide range of road network users, traffic management centres and public authorities as well as service providers.
- **Investigate issues related to remote management** (remote assistance and remote driving) as important element for safe operation of Connected Automated Vehicles: support requirement, functional safety, human-machine interaction, validation, in-service monitoring, KET, labour market aspects, roles and responsibilities,...

R&I Priorities and emerging needs

Key Enabling Technologies



- Fail-operational and cyber-secure components & systems in their entire ODD
- Robustness and resilience
- New explainable concepts and training of AI for CCAM applications
- AI for situational awareness
- System architecture for data sharing

- AI for advanced and **collective perception and decision making**
- Efficient and **cost-effective smart distributed processing tools** and a flexible software infrastructure allowing distributed processing (edge/cloud).
- AI approaches are to be further developed, reducing the data requirements, e.g. **federated learning approaches** for CCAM, edge AI and edge/cloud communication.
- **Remote management** imposes new challenges to communication technologies where the latency, bandwidth and communication channel reliability will be of paramount importance
- **Communication link** needs to be available and predictable (availability and availability conditions) and should be part of the ODD definition



<https://selfy-project.eu/>



<https://horizon-connect.eu/>



<https://www.ai4ccam.eu/>



<https://aithena.eu/>

CCAM Large Scale Demonstrations



- ✓ Real conditions
- ✓ Harmonised scenarios
- ✓ Harmonised methodologies
- ✓ Wider and long-term impacts

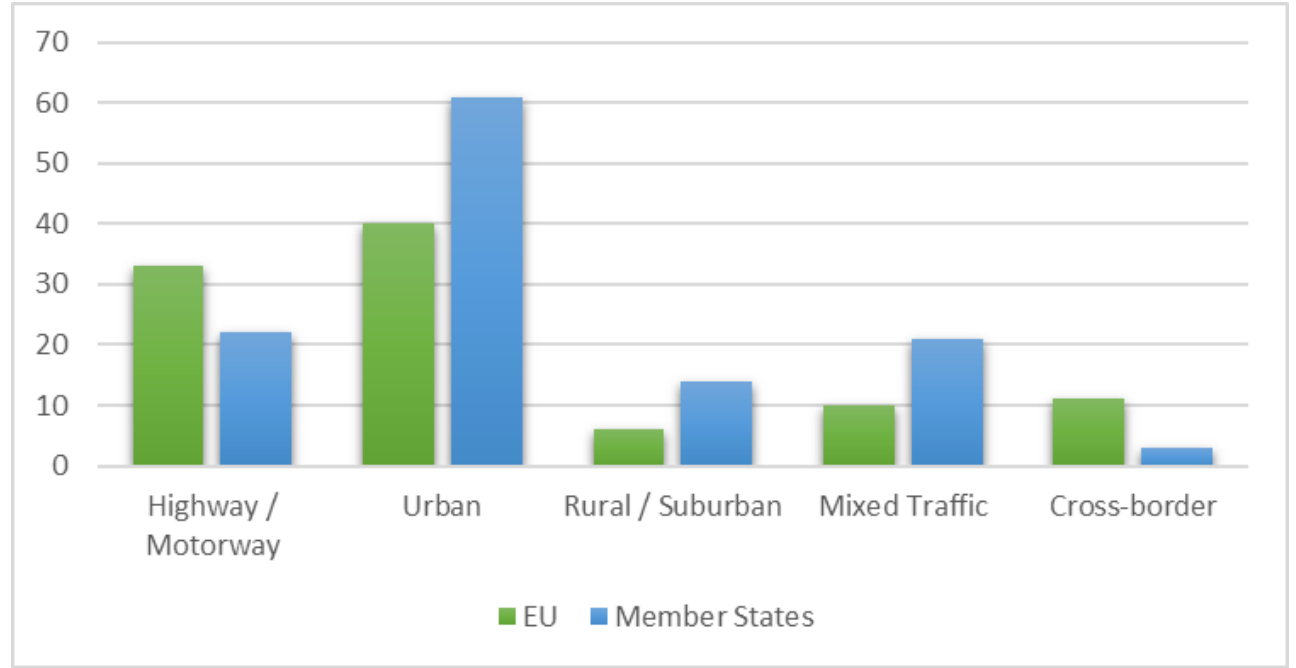
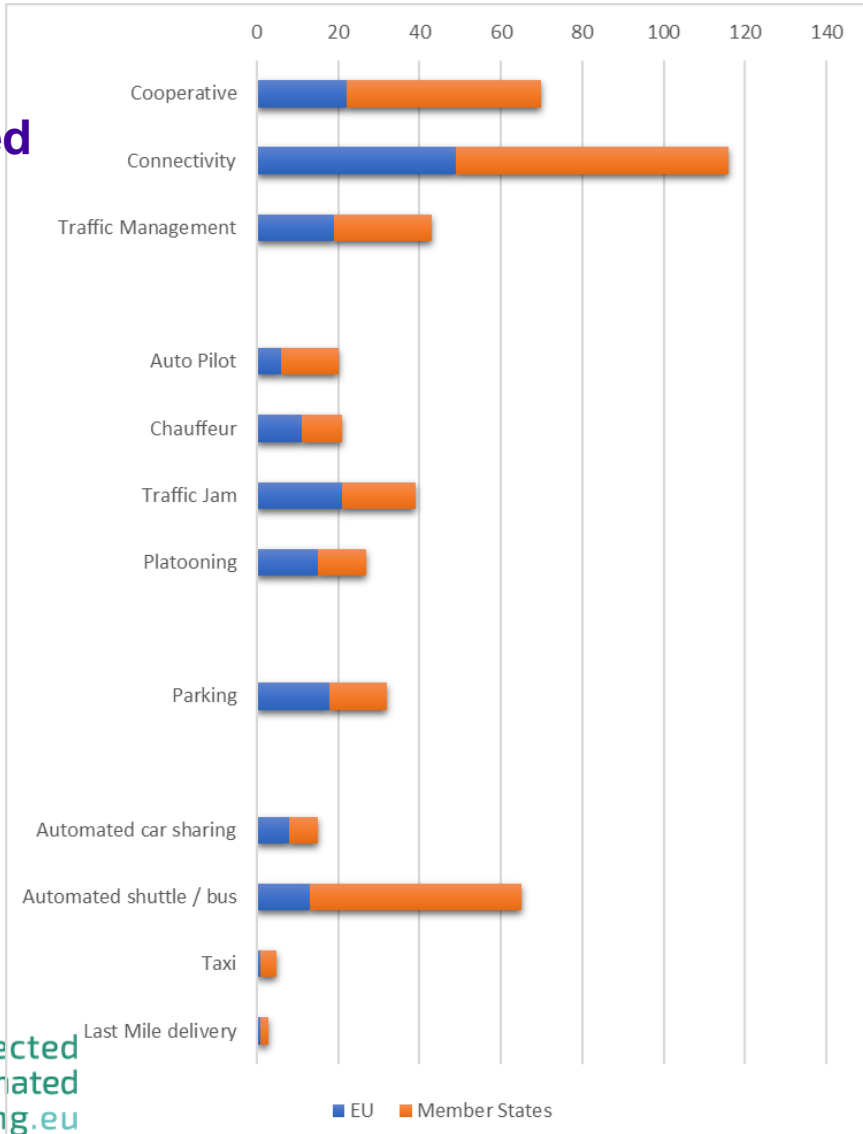
CCAM R&I and testing by Topics

Connected Services

Highway

Parking

Urban Traffic



EU wide Knowledge Base on CCAM
 383 projects (September 2023)
 50% Member States

Preparation of large-scale demonstrations

Research / Development / Innovation

Differentiation of use cases for their suitability for Large Scale Demos:

- Innovation** → clear candidate
- Development** → possible candidate
- Research** → specific demos

Connected Services

- assistance for all and everywhere
- Innovation: C-ITS services, e.g. RTTI & SRTI; Fleet management
Carsharing schemes
- Development: Bus auto-follow at stations

Parking and confined areas

- cars, buses and trucks
- Innovation: AVP Type 2
- Development: AVP Type 1,
Bus depot / Truck terminal
- Research: L4 Truck hub-to-hub operation

Highways

- cars and trucks
- Innovation: L3 Traffic Jam
- Development: L3 Commute,
L4 Truck safe auto-follow
- Research: L3/L4 Full Highway

Urban traffic for people and goods

- shuttles and delivery vehicles
- Innovation: Last mile goods and services
- Development: Fixed route shuttle/shared
- Research: Flexible route people and goods

Source: ERTRAC, CCAM Partnership

Demonstration and Deployment Challenges



Lack of deployment vision and viable business model in R&I demonstrations

Strategy to come back to reasonable projects in closed sites with added value

Difficulty shifting form short term to long term profit

Need meaningful offers that address people and societal needs

Scaling up is costly for the infrastructure but needed for wider impacts

Need further harmonisation of regulation (type approval and testing exemption)

R&I Projects

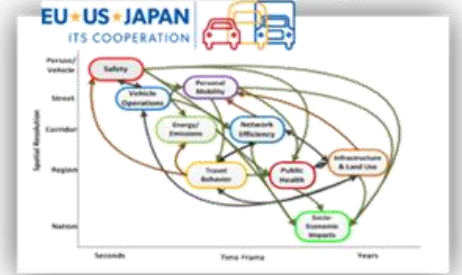


CCAM Knowledge Base

“One-stop shop” for all CCAM related activities in Europe



Evaluation Methodologies



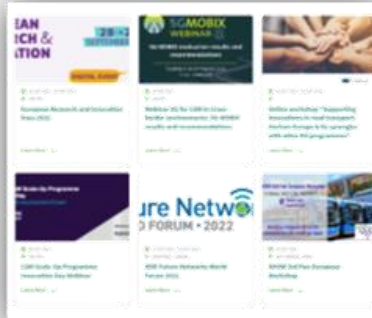
Policies & Regulations



Strategies & Action Plans



News & Events



EUCAD



Data Sharing Framework



Standards

Standards Collection

Standard	Organization	Year	Status
EN 15253-1	EN 15253-1	2017	Standard
EN 15253-2	EN 15253-2	2017	Standard
EN 15253-3	EN 15253-3	2017	Standard
EN 15253-4	EN 15253-4	2017	Standard
EN 15253-5	EN 15253-5	2017	Standard
EN 15253-6	EN 15253-6	2017	Standard
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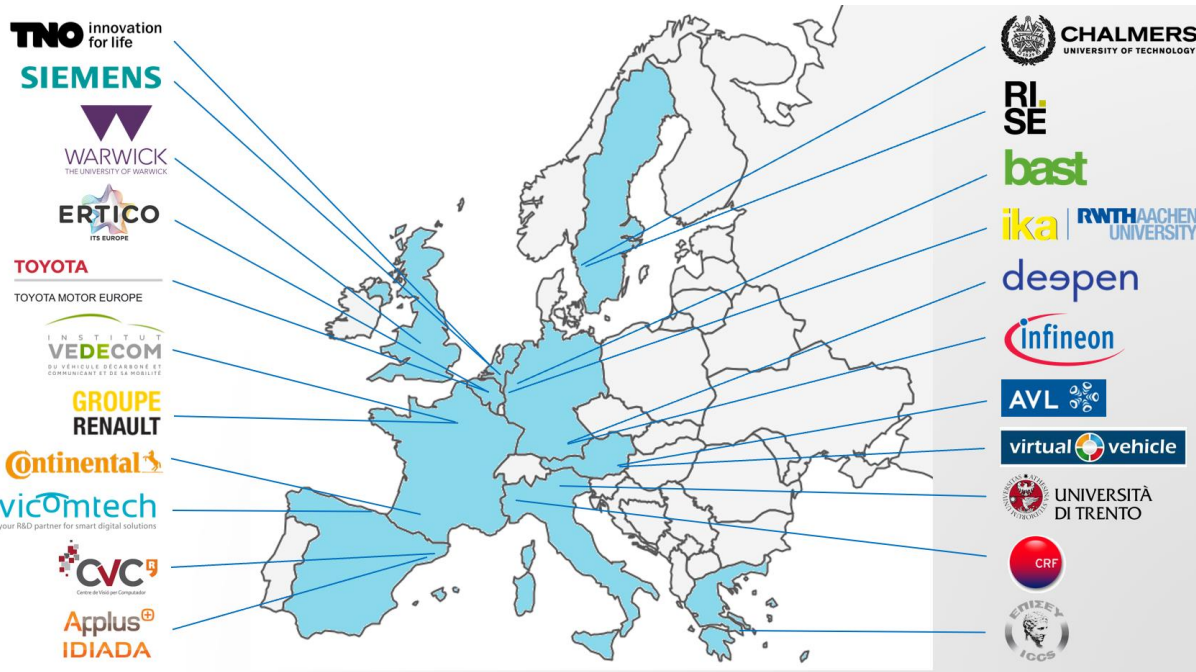
Develop and provide a harmonized and scalable **CCAM*** **Safety Assurance Framework** that fulfils the needs of different automotive stakeholders, for a continuously evolving number of use cases and scenarios.

Key Facts

- Sep 2022 – Aug 2025
- Budget: 13.5 M€

Online Cooperation Platform

- Participate in forum discussions, working groups, webinars and workshops
- Exchange documents and research findings
- Collaborate on joint projects



Connect with us

Registering will only take 5 minutes of your time, allowing you to influence the next 20 years in safety assurance of CCAM systems.



itsworldcongress.com



DUBAI ITS World Congress

16 -20 September 2024
Mobility Driven by ITS



ITS EUROPE

Thank you
for your attention



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**“Alone we can do so little,
together we can do so much”** Helen Keller

ERTICO Partnership

ertico.com | [@ertico](https://www.instagram.com/ertico)