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CCAM

Biennial¹ Full Report of the Co-programmed European Partnership CCAM.

for the period 30/06/2023 – 31/12/2025

For Additional activities, the reporting period is 01/01/2024 – 31/12/2025.

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Access the executive summary:



Table of contents

1. Introduction	7
1.1. Summary of the main activities and achievements	7
1.2. Impact case studies	11
2. Implementation of the Horizon Europe Work Programme during the reporting period (Union contribution)	15
3. Functioning of the Partnership	18
4. Governance	19
5. Lessons learned and outlook	20

1. Introduction

1.1. Summary of the main activities and achievements

Summary of the main activities and achievements

Over the reporting period, spanning from the second half of 2023 to 2025, the CCAM Partnership has consolidated its role as a central coordination instrument for Connected, Cooperative and Automated Mobility in Europe. Activities have combined strategic governance, effective implementation of research and innovation actions, and strong policy engagement, resulting in measurable progress across the entire value chain, from research and development to pre-deployment conditions. Rather than operating through isolated initiatives, the Partnership has evolved into a structured and integrated ecosystem, coordinating a portfolio of 38 collaborative Horizon Europe projects, supporting 27 active testing and demonstration initiatives, and progressively enabling the transition towards large-scale deployment.

Strategic governance and stakeholder alignment

A key achievement of the reporting period has been the consolidation of a stable and effective governance framework ensuring alignment across stakeholders and continuity of the strategic agenda. The General Assemblies have played a central role in this process. The meeting held on 4 July 2023 in Brussels marked a significant step forward in operationalising the Partnership's objectives. During this session, stakeholders conducted a structured analysis of CCAM use cases across multiple domains, including urban environments, highways, logistics, and parking scenarios. This analysis explicitly linked technological maturity with economic viability, societal impact and deployment readiness, thus ensuring that subsequent research activities would be oriented towards realistic market conditions.

A major milestone was reached on 13 December 2023 with the formal endorsement of the updated Strategic Research and Innovation Agenda (SRIA). This made the CCAM Partnership the first Horizon Europe partnership to adopt a revised SRIA, following an extensive and inclusive consultation process involving Partnership members, Member States and the European Commission. The updated SRIA provides a shared reference framework guiding European CCAM actions and ensuring alignment with evolving technological and policy developments. Subsequent General Assemblies in 2024 and 2025, held respectively in May and December 2024 and June and November 2025, ensured continued alignment with Horizon Europe Work Programmes and contributed to the preparation of future strategic orientations, including those related to FP10.

At Member State level, coordination has been ensured through the State Representatives Group (SRG), which has played a central role in bridging EU-level priorities with national implementation. Meetings held in Barcelona in September 2023, in Brussels in February 2024, as well as in Gdańsk in April 2025 and Athens in October 2025, in addition to the High-Level Dialogue in Ghent in June 2024, have ensured regular exchange and alignment. Participation reached up to 26 Member States and Associated Countries, with active participation levels between 59% and 70%. Discussions within the SRG have addressed key issues such as regulatory frameworks, testing harmonisation, digital and physical infrastructure, societal acceptance and deployment barriers. This governance structure has ensured strong coherence between European priorities, national strategies and project implementation.

Implementation of research and innovation activities

The CCAM Partnership has ensured continuous and effective delivery of Horizon Europe activities across all SRIA clusters. Over the reporting period, a total of 38 projects have been monitored and coordinated, providing comprehensive coverage of the CCAM value chain. The implementation capacity of the Partnership is reflected in the continuous launch and selection of projects. In 2024, eleven projects funded under the 2023 Work Programme were launched, followed by additional eight projects selected

under the 2024 Work Programme. CCAM community was involved in 2025 in the preparation of the upcoming WP26/27 calls.

Project activities span all seven SRIA clusters, including vehicle technologies, validation and safety frameworks, infrastructure integration, societal aspects, and large-scale demonstration. This broad coverage ensures full alignment with SRIA objectives.

Technological maturity across the portfolio has significantly increased. The majority of projects are reaching Technology Readiness Levels 6 and 7, corresponding to prototype demonstration in relevant and operational environments, while several components are progressing towards TRL 8 and 9, moving closer to near-commercial deployment.

Implementation has been supported by structured coordination activities, including Multicluster Meetings held in November 2023, October 2024 and April 2025, each gathering up to 120 participants, as well as networking events held in March 2024 and March 2025. These events have facilitated consortium building, exchange of results and alignment on Work Programme priorities, ensuring that projects contribute to a coherent and integrated portfolio rather than isolated developments.

Testing, demonstration and deployment preparation

A major achievement of the Partnership has been the scale and quality of testing and demonstration activities across Europe performed by the projects: out of the 38 in the portfolio, 27 are actively conducting testing and demonstration activities. These activities involve approximately 135 vehicles deployed across different environments and have resulted in more than 115,000 kilometres of testing in real-world conditions. Testing activities are carried out across a wide range of environments, including urban roads, highways, cross-border corridors, simulators and dedicated test tracks, and are conducted in mixed traffic conditions involving both automated and conventional vehicles.

The demonstration ecosystem has expanded significantly, reaching 43 demonstration sites across Europe, thereby exceeding the SRIA target of 30 sites by 2030. These sites provide strong geographical coverage, including countries such as Germany, Spain, France, Italy, Greece and the Nordic region. The majority of demonstrations, representing approximately 80 to 85%, are focused on passenger mobility, including automated shuttles and urban transport solutions. At the same time, freight and logistics applications are emerging, representing around 10 to 15% of activities, primarily driven by projects such as [MODI](#).

Several concrete examples illustrate the progress achieved. The [MODI](#) project has successfully demonstrated the first autonomous cross-border freight transport, addressing a key barrier to large-scale deployment. The [ULTIMO](#) project has developed near-commercial autonomous shuttle services reaching Technology Readiness Levels up to 9, while projects such as [IN2CCAM](#) and [CONDUCTOR](#) have demonstrated real-life urban applications, achieving measurable improvements in traffic flow and system integration.

The transition from testing to deployment is increasingly visible. As of the reporting period, 11 cities are already implementing or preparing to implement CCAM services, and initial operations are taking place on three TEN-T corridor sections. These developments clearly demonstrate the progression from pilot testing towards pre-deployment and operational conditions.

Policy, regulatory and international positioning

The CCAM Partnership has significantly strengthened its role in shaping European policy and regulatory frameworks. In 2024, participation in the High-Level Dialogue on Connected and Automated Driving held in Ghent contributed directly to the establishment of the European Forum on Automated Transport (EFAT), confirming the Partnership's influence on policy development. The Partnership has also actively engaged with DG GROW and standardisation bodies such as UNECE, ISO and ETSI, contributing to the development of regulatory and technical frameworks for automated mobility.

In 2025, the Partnership further strengthened its strategic positioning through active involvement in the Strategic Dialogue on the Future of the Automotive Industry. The CCAM concept paper for FP10, published in February 2025, defined key priorities for future research and innovation, including technological leadership, cross-border deployment, industrial competitiveness and scaling of CCAM solutions. These contributions are reflected in the European Automotive Action Plan presented in March 2025.

At the same time, the Partnership contributed to the establishment of a new European Automotive Partnership framework, in cooperation with ERTRAC, 2Zero and EARPA, and in coordination with EUCAR and CLEPA. The Memorandum of Understanding signed in September 2025 with the European Commission and other partnerships established a structured approach for future collaboration, including the preparation of a joint European vision by December 2025 and a future SRIA by mid-2026. These developments demonstrate that the CCAM Partnership is not only delivering research and innovation, but is actively shaping European industrial and policy strategies.

Monitoring, evaluation and knowledge management

A major structural achievement of the reporting period has been the establishment of a comprehensive monitoring and evaluation framework. The monitoring study conducted by fka GmbH covers all 38 CCAM projects and is based on 29 Key Performance Indicators combining qualitative and quantitative data. The methodology includes interviews with more than 30 project representatives, completed by March 2025, and a complementary survey with 35 responses. This approach provides a robust evidence base for assessing project outcomes, challenges and impacts.

The monitoring framework enables systematic tracking of testing activities, including the number of vehicles and kilometres driven, incidents and safety performance, as well as technological maturity through TRL progression. It also captures societal aspects such as user acceptance, dissemination outputs, and alignment with SRIA objectives.

A key output in this field worth mentioning is the European Common Evaluation Methodology (EU-CEM), published in 2025. The EU-CEM has already been adopted by 26 projects, representing approximately 66% of the portfolio, and has significantly improved the comparability and quality of evaluation processes across projects.

In parallel, the [FAME](#) Knowledge Base has successfully expanded to include 480 CCAM projects, exceeding the target of 400 projects. The Knowledge Base now includes 109 projects from non-EU countries and shows a significantly improved geographical balance, including increased representation from Eastern Europe. This confirms its role as a central platform for knowledge exchange and coordination.

Dissemination, visibility and outreach

The Partnership has achieved a high level of visibility and dissemination at both European and international level. Major events have played a key role in this process. The RTR Conference 2024 gathered 735 participants and featured 76 project presentations, while the RTR Conference 2025 reached approximately 900 participants and showcased 90 projects. The EUCAD 2025 Symposium, held in Ispra, brought together more than 400 experts across 18 sessions. In addition, the Partnership has actively participated in major international events such as the ITS European Congress in Seville and the Transport Research Arena in Dublin.

Dissemination outputs across the project portfolio are significant. A total of 761 public reports and 519 scientific papers and theses have been produced, alongside 38 contributions to standards and patents. On average, each project has delivered approximately 23 deliverables. These outputs are complemented by communication tools such as the CCAM website, the “Project in the Spotlight” initiative, project portfolios and explanatory communication materials, including videos and outreach tools. Together, these activities ensure effective knowledge transfer and strong international visibility.

Investment leverage and stakeholder engagement

The Partnership has demonstrated a strong capacity to mobilise both private and public investment. In-kind contributions from industry amounted to approximately €520 million for the period 2021–2023, followed by €257 million reported in 2023 and approximately €230 million in 2024 and 2025.

Engagement with public authorities has also increased significantly. Around 40 regional and local authorities are now involved in CCAM projects, participating in 24 projects across the portfolio. Cities such as Vienna, Oslo, Geneva and Tampere are actively involved in testing and preparing CCAM deployment. This engagement has been further strengthened in 2025 through the launch of a Call for Expression of Interest for Cities and Regions, supported by workshops organised in Brussels in October 2025 and in Utrecht in November 2025 in cooperation with POLIS.

These activities contribute to the development of a CCAM Urban Deployment Roadmap, which defines the conditions and actions necessary to support large-scale deployment. Overall, this confirms the increasing integration of CCAM solutions into real mobility systems.

Contribution to SRIA objectives and systemic impact

Across all activities, the CCAM Partnership has delivered measurable progress towards the SRIA objectives, supported by robust KPI evidence. In terms of safety, the Partnership has achieved a key milestone with zero fatal or severe accidents recorded across approximately 135 vehicles and more than 115,000 kilometres of testing. This provides encouraging evidence of safety-by-design approaches and validation methodologies developed within the Partnership, including the Safety Assurance Framework developed under the [SUNRISE](#) project.

Significant progress has also been observed in system integration and efficiency. Projects such as [IN2CCAM](#) and [CONDUCTOR](#) have demonstrated measurable improvements, including reductions in travel times of 10 to 20%, reductions in CO₂ emissions of 5 to 15%, and improvements in traffic flow efficiency of up to 25%. These results are supported by the increasing use of artificial intelligence for traffic coordination and multimodal optimisation.

Deployment readiness has been significantly strengthened through the expansion of demonstration sites, the activation of TEN-T corridors and the involvement of cities in implementation activities. Knowledge sharing and standardisation have also progressed, with 32 projects, representing approximately 84% of the portfolio, using common methods, tools and taxonomies, and with 79% of projects actively disseminating results through major European platforms such as RTR and EUCAD.

Technological leadership is reinforced by the strong engagement of projects in emerging fields, with 76% of projects active in areas such as artificial intelligence, data analytics and cybersecurity. Concrete outputs include the cybersecurity toolbox developed by [SELFY](#), the scenario data space developed by [SYNERGIES](#), the trustworthy AI frameworks developed by [CONNECT](#) and [AITHENA](#), and the driver behaviour model and data hub developed by [BERTHA](#).

Finally, societal integration has significantly progressed. The share of projects addressing societal aspects has increased from 44% to 74%, while 21 projects are conducting acceptance surveys. Early results indicate that approximately 63% of users express willingness to use CCAM services, particularly after experiencing them in real conditions.

Overall, the evidence demonstrates that the CCAM Partnership has moved beyond coordination of research activities towards the establishment of a structured, measurable and deployment-oriented European ecosystem. By combining technological development, large-scale testing, policy alignment and

stakeholder engagement, the Partnership has laid the foundations for the large-scale deployment of CCAM solutions in Europe.

1.2. Impact case studies

From coordinated research to a European CCAM system

The CCAM Partnership provides a clear example of how coordinated European research can move an emerging technology from fragmented experimentation towards structured pre-deployment conditions. Based on the monitoring of 38 projects and 29 Key Performance Indicators, the Partnership has not only delivered individual project results, but has built a coherent European system for Connected, Cooperative and Automated Mobility, aligned with policy, regulatory and industrial priorities.

A key lesson emerging from the portfolio is that impact is not generated at project level alone, but through the combination of activities across clusters, linking technology development, validation, large-scale testing, societal integration and regulatory alignment. This integrated approach has been essential to reduce risks for innovation and to create credible pathways towards deployment.

Case study: Cross-border automated logistics as a pathway to deployment (MODI)

One of the most relevant achievements of the Partnership is demonstrated through the **MODI** project, which focuses on accelerating the adoption of highly automated freight vehicles along a major European logistics corridor. The project spans the TEN-T network from Rotterdam to Oslo, crossing four national borders and integrating operations across key ports and logistics hubs. By implementing five real-world use cases, **MODI** provides a concrete demonstration of how CCAM technologies can be deployed in complex, cross-border logistics environments.

A key success lies in the integration of vehicles, infrastructure and operations within a logistics-centred ecosystem. The project has advanced state-of-the-art automated driving technologies through iterative vehicle adaptation, including hardware and software integration, safety validation processes aligned with EU requirements, and the development of tailored human-machine interaction concepts. In parallel, **MODI** has delivered optimised designs for physical and digital infrastructure, including coordinated interfaces for CCAM operations, enabling interaction between fleet operators and traffic management systems.

The project has also made significant progress in addressing deployment barriers. Demonstrations across public roads and logistics terminals have validated the feasibility of automated operations in mixed traffic conditions, including motorway driving, urban environments, hub-to-hub transport and border crossings. At the same time, the project has contributed to identifying and addressing regulatory, infrastructural and operational gaps, providing concrete recommendations for harmonisation and large-scale deployment.

A critical element of **MODI**'s success is its strong stakeholder collaboration. By bringing together logistics operators, infrastructure managers, public authorities and technology providers, the project has enabled co-creation of solutions aligned with real market needs. This has supported the development of viable business models and strengthened the link between research outcomes and operational deployment.

Impact: **MODI** demonstrates that automated freight transport can be implemented in real-world, cross-border conditions, significantly advancing both technology and market readiness. It provides

strong evidence of the potential of CCAM to improve logistics efficiency, reduce operational costs, address driver shortages and contribute to environmental sustainability. At the same time, it reduces uncertainty for regulators and industry by validating interoperable solutions at the European scale.

Follow-up: The outcomes of MODI are directly feeding into future large-scale deployment initiatives, regulatory frameworks and standardisation efforts. The validated use cases, infrastructure models and cooperation mechanisms create a clear pathway towards the operationalisation of automated logistics corridors in Europe, supporting the transition from pilot projects to market-ready CCAM services.

Case study: Advancing safety validation through structured methodologies and tools (SUNRISE)

One of the key achievements of the Partnership is the advancement of harmonised safety validation approaches through the SUNRISE project, in particular the development of the Interactive Safety Assurance Framework Handbook. This tool provides a structured and practical methodology to support experts, developers and regulators in assessing and demonstrating the safety of CCAM systems across different use cases and operational contexts.

A central success of SUNRISE is the translation of complex safety requirements into an accessible and operational framework. The Interactive Handbook enables users to navigate safety assurance processes step by step, integrating technical, operational and regulatory dimensions. It supports the identification of hazards, definition of safety requirements, and selection of appropriate validation methods, while ensuring traceability across the entire development and validation lifecycle.

The project has also played a key role in fostering convergence among stakeholders. By providing a common reference framework, SUNRISE has facilitated alignment between industry, research and regulatory communities on safety assurance principles. The approach integrates aspects such as system design, operational design domains, human-machine interaction, and the use of simulation and real-world testing, contributing to a holistic and consistent safety validation methodology.

Importantly, SUNRISE has bridged the gap between research and regulatory application. The framework and tools developed are already being considered in standardisation and regulatory discussions, supporting the development of common approaches to safety certification. This reduces fragmentation and provides a clearer pathway for the approval and deployment of automated driving systems.

Impact: The SUNRISE results significantly strengthen confidence in CCAM safety validation processes by providing a structured, transparent and widely accepted methodology. This reduces uncertainty for developers and regulators, supports harmonisation across Europe, and accelerates progress towards certification and deployment.

Follow-up: The Safety Assurance Framework and the Interactive Handbook are being further developed and applied in ongoing and future projects, as well as in standardisation and regulatory processes at European and international level. Their continued integration into large-scale demonstrations and deployment activities will support the transition from research to operational CCAM systems in Europe.

Case study: Building a common European framework for validation and knowledge sharing (European Common Evaluation Methodology)

A key driver of impact has been the rapid adoption of common methodologies, tools and frameworks across the portfolio. The use of shared methods and taxonomies has increased threefold, now covering approximately 84% of projects. The European Common Evaluation Methodology, published in 2025, is already referenced by 26 projects, exceeding its initial target of 10 projects by 260%.

In parallel, the Knowledge Base has expanded to more than 400 projects, with significantly improved geographical coverage, including stronger participation from previously underrepresented regions and increased inclusion of international initiatives. Nearly 80% of projects actively contribute to European knowledge-sharing platforms and major conferences such as RTR and EUCAD.

Impact: this high level of alignment reduces fragmentation, ensures comparability of results, and accelerates collective learning. It also establishes Europe as a reference framework for CCAM validation and testing, strengthening its international positioning.

Follow-up: the continued development of shared tools, including the Common Evaluation Methodology, data spaces and interoperability frameworks, will support future programmes and contribute to standardisation and certification processes. These assets also provide a basis for international cooperation and industrial uptake.

Enhancing perception and cooperative awareness through real-world demonstrations (ROADVIEW)

A key achievement of the Partnership is illustrated by the [ROADVIEW](#) project, which focuses on improving road safety and traffic efficiency through advanced perception and cooperative systems. The project has demonstrated how infrastructure-based sensing, combined with vehicle intelligence and connectivity, can significantly extend the perception capabilities of connected and automated vehicles, especially in complex and safety-critical environments.

One of the main successes of [ROADVIEW](#) lies in its demonstration activities, where multiple use cases were validated in real traffic conditions. These demonstrations focused on challenging scenarios such as obstructed views at intersections, vulnerable road user detection, and hazardous situations beyond the direct line of sight of vehicles. By integrating roadside sensors, including cameras and other detection systems, with vehicle-based perception and V2X communication, [ROADVIEW](#) enabled the sharing of real-time situational awareness between infrastructure and vehicles.

The project developed and tested cooperative perception services that allow vehicles to “see beyond their sensors,” significantly improving their ability to anticipate risks and react safely. This was complemented by the use of digital twins and data-driven approaches, enabling continuous validation, simulation and optimisation of system performance. The demonstrations also highlighted the importance of data fusion, combining inputs from multiple sources to create a reliable and comprehensive understanding of the traffic environment.

Another important achievement is the validation of interoperability between different system components, including infrastructure, vehicles and communication layers. [ROADVIEW](#) has contributed to demonstrating how standardised approaches can support seamless integration and scalability across different environments. The project also provided valuable insights into the deployment of physical and digital infrastructure required to support cooperative perception services.

Impact: [ROADVIEW](#) significantly advances the safety and reliability of CCAM systems by addressing one of their key limitations: restricted perception in complex environments. By enabling vehicles to access extended, infrastructure-supported perception, the project reduces collision risks, enhances decision-making capabilities, and strengthens trust in automated driving technologies. These results provide a strong basis for future deployment of cooperative perception services across European road networks.

Follow-up: The outcomes of [ROADVIEW](#) are being taken forward in ongoing and future initiatives, contributing to the development of next-generation C-ITS services and large-scale deployment of cooperative perception systems. The validated technologies, architectures and use cases are directly supporting the transition from experimental solutions to operational applications, paving the way for safer and more scalable CCAM deployment in Europe.

Overall impact and key takeaways

Taken together, these case studies show that the CCAM Partnership is delivering impact at system level. Europe now has in place the technical, methodological and organisational foundations needed for deployment. The Partnership model has proven effective in aligning stakeholders, reducing fragmentation and accelerating innovation.

A number of consistent lessons emerge across the portfolio: the need for integrated physical and digital infrastructure, standardised and FAIR data ecosystems, hybrid validation approaches combining simulation and real-world testing, early regulatory engagement, and strong user involvement.

While some impacts, particularly those related to large-scale deployment and market uptake, are still emerging, the trends are clearly positive. The remaining gaps are largely related to data maturity and scale rather than technological capability.

Maintaining this integrated, end-to-end approach, and ensuring continuity through future funding instruments and industrial initiatives, will be essential to translate these results into large-scale deployment and to secure Europe's leadership in CCAM.

2. Implementation of the Horizon Europe Work Programme during the reporting period (Union contribution)

Table 1: Contributions provided by the Partners other than the Union and by the EU to the Partnership's Horizon Europe projects in the reporting period (30/06/2023 - 31/12/2025)

Call for proposals code		Link to Partnership's general objective(s)
CLUSTER 1: Large-scale Demonstrations	- HORIZON-CL5-2022-D6-01-01 (MODI, ULTIMO) - HORIZON-MISS-2023-CIT-01-01 (metaCCAZE, MOBILITIES FOR EU)	These calls ensure that Europe leads not only in technology development but also in real-world deployment and societal integration of CCAM. They support large-scale demonstrations, user acceptance, and integration into urban mobility systems.
CLUSTER 2: Vehicle Technologies	- HORIZON-CL5-2021-D6-01-01 (ROADVIEW, EVENTS) - HORIZON-CL5-2022-D6-01-02 (AWARE2ALL) - HORIZON-CL5-2023-D6-01-01 (AutoTRUST, OptiPEX) - HORIZON-CL5-2024-D6-01-01 (EEA4CCAM, UP2DATE4SDV)	These calls reduce fatalities and injuries by making automated systems better able to perceive, predict and safely respond to real-world mixed-traffic situations.
CLUSTER 3: Validation	- HORIZON-CL5-2021-D6-01-02 (SUNRISE) - HORIZON-CL5-2022-D6-01-03 (i4Driving, BERTHA) - HORIZON-CL5-2023-D6-01-02 (SYNERGIES) - HORIZON-CL5-2024-D6-01-02 (CERTAIN)	Building leadership in verification, validation, and safety assurance frameworks. These calls build shared European knowledge assets (scenario libraries, simulation) and shorten innovation cycles through iterative validation.
CLUSTER 4: Integrating CCAM in the Transport System	- HORIZON-CL5-2021-D6-01-03 (PoDIUM, AUGMENTED CCAM) - HORIZON-CL5-2022-D6-01-04 (IN2CCAM, CONDUCTOR) - HORIZON-CL5-2023-D6-01-03 (FRODDO, iEXODDUS) - HORIZON-CL5-2024-D6-01-03 (CARMONY, CHORUS)	These calls focus on the physical and digital infrastructure, traffic management, and the integration of CCAM into the wider transport ecosystem, including freight, urban mobility, and V2X cooperation.

CLUSTER 5: Key Enabling Technologies	• HORIZON-CL5-2021-D6-01-04 (CONNECT, SELFY) • HORIZON-CL5-2022-D6-01-05 (Althena, AI4CCAM) • HORIZON-CL5-2024-D6-01-04 (AIGGREGATE, HIDDEN)	Reinforcing leadership in core enabling technologies such as AI-based perception and connected vehicle intelligence, while ensuring systems are resilient against cyber threats.
Cluster 6: Societal Aspects and People Needs	• HORIZON-CL5-2021-D6-01-05 (Move2CCAM, SINFONICA) • HORIZON-CL5-2023-D6-01-04 (CulturalRoad, Diversify – CCAM) • HORIZON-CL5-2023-D6-01-05 (CCAM-ERAS, RESKILLING)	Addressing the coexistence challenge between human drivers, pedestrians, and cyclists, and generating knowledge on how users perceive, interact with, and trust CCAM systems.
Cluster 7: Coordination	• HORIZON-CL5-2021-D6-01-06 (FAME) • HORIZON-CL5-2024-D6-01-05 (CCAMBassador)	Ensuring research results are systematically captured and reused, and enhancing the circulation of knowledge across industry, academia, and public authorities

The strategic alignment of the Horizon Europe calls ensures that the CCAM portfolio does not merely advance isolated technologies, but directly contributes to the overarching impacts defined in the SRIA:

Safety: The portfolio has shifted the safety paradigm from simple collision avoidance to a comprehensive, scenario-based validation approach. This is evidenced for example by [AWARE2ALL](#), which has proactively broadened scenario definitions to encompass a more diverse range of road users, ensuring that safety is not limited to standard traffic patterns. Furthermore, the work of [CERTAIN](#) is extending this impact beyond Europe, developing methodologies that are poised to influence international standards for automated vehicle approval across 56 different countries. By integrating advanced techniques such as SOTIF (Safety of the Intended Functionality) and HARA (Hazard Analysis and Risk Assessment), the portfolio is establishing a global benchmark for the certification of highly automated systems.

Environment and Efficiency: Beyond immediate reductions in emissions, the portfolio is laying the groundwork for scalable, AI-driven traffic orchestration. [CARMONY](#), for example, is advancing the ability to anticipate and mitigate congestion through system-level coordination, which is expected to yield substantial long-term economic gains and reductions in travel time. This transition from pilot-level efficiency to system-wide optimization is critical for ensuring that CCAM contributes to the European Green Deal by minimizing unnecessary mileage and optimizing the use of existing infrastructure capacity.

Inclusiveness: The transition toward a human-centered, co-design methodology has played a meaningful role in the portfolio's overall impact. [SINFONICA](#) has demonstrated the feasibility of engaging vulnerable groups directly in the design process, ensuring that automated mobility is accessible to all citizens regardless of physical or cognitive ability. This is complemented by [OptiPEX](#), which focuses on the co-creation of passenger-aware public transport services to align technology with actual user needs. Additionally, the [RESKILLING](#) project addresses the socio-economic dimension of inclusiveness by developing a taxonomy of CCAM-related skills, ensuring that the workforce is prepared for the transition to automated mobility and that the economic benefits are equitably distributed.

Competitiveness: Europe's technological sovereignty is enhanced through the creation of reusable, high-value digital resources and security frameworks. The development of a comprehensive cybersecurity toolbox by [SELFY](#) provides the industry with a validated solution to secure CAV systems against evolving threats. Simultaneously, [SYNERGIES](#) is establishing a federated Scenario Dataspace, which significantly reduces the time and cost of AI-supported validation for European OEMs. The portfolio also strengthens leadership in trust and perception; [CONNECT](#) has developed a trust assessment framework that is actively influencing 5GAA industry standards, while [BERTHA](#) has provided a foundational, empirically grounded Driver Behaviour Model and open data hub to accelerate the development of more natural and predictable automated driving. Finally, [ROADVIEW](#) is ensuring competitiveness in challenging environments by advancing perception technologies specifically designed for harsh weather conditions.

3. Functioning of the Partnership

The CCAM Partnership operates under a co-programmed governance model that brings together the European Commission and private stakeholders gathered in the CCAM Association, in line with Article 10 of the Horizon Europe framework. Its functioning is designed to enhance effectiveness in identifying strategic research and innovation priorities while ensuring alignment with national activities and broader policy objectives. A central operational feature of the Partnership is its organisation into seven interconnected thematic clusters, which structure the implementation of activities and integrate perspectives from key stakeholders such as industry, policymakers, road operators, and users. These clusters cover large-scale demonstrations, vehicle technologies, validation, system integration into transport, key enabling technologies, societal aspects, and overall coordination, and collectively contribute to the achievement of the Partnership's operational objectives.

On the stakeholders' side, participation is organised through the CCAM Association, whose internal governance is defined in its statutes. The General Assembly, composed of all members, sets the overall policy direction and provides recommendations for implementation. The Administration Board, appointed by the General Assembly, is responsible for managing the Association and overseeing its administrative, operational, and legal functions. The Executive Group, with a limited number of members, drives the implementation of activities and ensures coordination across the seven clusters, translating strategic objectives into concrete actions. The Partnership Delegation represents the Association within the Partnership Board and provides consolidated expertise and recommendations on research and innovation priorities. The Secretariat supports the daily functioning of the Association under the supervision of the Administration Board.

The Partnership Board constitutes the core interface between the European Commission and the CCAM Association and serves as the governing body of the co-programmed partnership. It brings together representatives from both sides to exchange views, define priorities, and formulate recommendations for the Connected, Cooperative and Automated Mobility work programmes under Horizon Europe. Through this mechanism, the Partnership ensures that research and innovation activities are strategically coordinated, reflect stakeholder needs, and remain aligned with European policy goals.

In addition, a States Representatives Group composed of representatives from EU Member States and countries associated with Horizon Europe supports the Partnership by ensuring complementarity with national policies and initiatives. It contributes to aligning priorities across governance levels, facilitates information exchange, and reviews progress towards expected scientific, economic, and societal impacts. Through this multi-layered structure, combining cluster-based implementation, association governance, and institutional coordination with the European Commission and Member States, the CCAM Partnership ensures coherent decision-making, effective stakeholder involvement, and alignment between research, policy and deployment in the field of connected, cooperative, and automated mobility.

4. Governance

The internal governance of the CCAM Partnership enhances its effectiveness by identifying strategic research and innovation (R&I) opportunities and potential synergies with national R&I activities. The partnership is organized into seven interconnected Clusters (<https://www.ccam.eu/our-actions/clusters/>), each focusing on specific R&I actions and aligning perspectives from various stakeholders such as road users, policymakers, road operators, and industry.

The 7 CCAM Clusters:

- ▶ Cluster 1: Large-scale Demonstrations
- ▶ Cluster 2: Vehicle technologies
- ▶ Cluster 3: Validation
- ▶ Cluster 4: Integrating CCAM in the transport system
- ▶ Cluster 5: Key enabling technologies
- ▶ Cluster 6: Societal aspects and people needs
- ▶ Cluster 7: Coordination

These Clusters contribute to achieving the CCAM Partnership's Operational Objectives.

Article 10 of the Horizon Europe framework outlines the relationship between the European Commission and the CCAM Association (the private side of the stakeholders), facilitating the co-programmed CCAM Partnership. The Partnership Board, comprising representatives from both sides, will exchange recommendations and priorities for the Connected, Cooperative, and Automated Mobility (CCAM) technologies Work Programme.

As defined in its statutes, the structure of the CCAM Association shall be as follows (<https://www.ccam.eu/what-is-ccam/governance/>):

- The General Assembly, comprising all members, it approves the general policy and provides recommendations for implementation.
- The Administration Board, appointed by the General Assembly, it manages the Association and oversees all administrative, operational, and legal actions.
- Executive Group: with up to 17 members, it develops activities to meet the Association's objectives, particularly through the seven thematic Clusters.
- Partnership Delegation: represents the CCAM Association within the European Partnership's Governing Board, providing expertise and recommendations for R&I topics.
- The Secretariat manages the Partnership's daily operations under the Administration Board's guidance.

The CCAM States Representatives Group (<https://www.ccam.eu/what-is-ccam/governance/ccam-states-representatives-group/>), made up of representatives from EU Member States and Horizon Europe Associated Countries, advises and supports the achievement of the Partnership's objectives. It ensures complementarity with national policies and reviews progress towards scientific, economic, and societal impacts.

5. Lessons learned and outlook

Over the reporting period, the CCAM Partnership has built a strong and comprehensive evidence base through the implementation and monitoring of 38 Horizon Europe projects. This portfolio demonstrates that the Partnership is delivering on the objectives set out in the SRIA and is progressing coherently towards its strategic vision. There is no need for a fundamental change in direction. On the contrary, results confirm that the approach has been effective. What is now required is a shift in emphasis: from validating technologies to accelerating integration, scaling up deployment, and strengthening Europe's global positioning.

A central lesson is that CCAM can only deliver impact through a system-level approach. Across the portfolio, it has become clear that isolated technological advancements are not sufficient. Real progress is achieved when vehicles, infrastructure, connectivity, data systems and users are developed and validated together. Experiences from multiple projects show that early integration of roadside infrastructure, digital twins, connectivity and traffic management systems is essential to ensure scalability, interoperability and regulatory readiness. This marks a clear transition away from fragmented pilots towards coordinated, deployment-oriented ecosystems embedded in real mobility systems, including urban environments and European transport corridors.

At the same time, the importance of robust digital foundations has been fully confirmed. Artificial intelligence, data analytics and cybersecurity are not supporting elements, but core enablers of CCAM. Experience shows that embedding principles of Trustworthy AI (transparency, explainability, traceability) from the outset is not optional, but critical for safety, certification and public acceptance. Structured approaches to data and model documentation have also proven key to improving interoperability and enabling more efficient validation and certification processes.

Data governance remains one of the most important challenges. While projects generate large quantities of high-value data, its reuse is still limited due to fragmentation, lack of standardisation, and constraints linked to privacy and intellectual property. The work carried out across the portfolio demonstrates that Europe must move decisively towards interoperable, trusted data ecosystems, based on common standards and FAIR principles, and aligned with regulatory frameworks such as GDPR. Without this, scalability and industrial uptake will remain constrained.

Another key lesson concerns validation. The combination of simulation and real-world testing has emerged as a best practice. Hybrid validation frameworks, based on scenario-driven approaches and probabilistic methods, allow faster development cycles and increased robustness. At the same time, real-world testing remains indispensable to address edge cases and ensure safe interaction with other road users. The systematic integration of these approaches is now a clear benchmark for future activities.

The need for early and continuous engagement with regulators has also become evident. Administrative complexity and fragmented regulatory frameworks continue to slow down testing and deployment, especially in cross-border contexts. Although successful examples exist, they remain limited. This underlines the importance of strengthening regulatory harmonisation, standardisation and structured dialogue with authorities, ensuring that innovation can scale across Europe.

From a societal perspective, the Partnership has successfully shifted towards a more human-centred approach. Increasing attention to user acceptance, inclusiveness and co-design has improved the relevance and usability of solutions. However, communication remains a critical factor. The experience shows that tangible demonstrations, prototypes and clear communication tools are essential to build trust and understanding among citizens and stakeholders.

At governance level, the Partnership has demonstrated that strong coordination mechanisms are effective. Multicenter collaboration, shared tools and common methodologies have significantly reduced fragmentation and fostered convergence. However, further efforts are needed to strengthen cross-project collaboration, data exchange and interoperability in order to maximise collective impact.

Taken together, these lessons confirm that the strategic direction defined in the SRIA is sound and has been successfully implemented. The Partnership has not only achieved the objectives set at the beginning of FP9, but in several areas has gone beyond expectations, creating a mature ecosystem, a solid knowledge base, and a strong European community around CCAM. This constitutes a major achievement. Importantly, these results have been delivered while the Partnership is still ongoing, demonstrating both its effectiveness and its potential.

The context in which the Partnership operates is however changing rapidly. Global competition in automated mobility is intensifying, particularly from the United States and China. In this environment, research and innovation are no longer only about technological progress, but about economic resilience, industrial leadership and technological sovereignty. Europe cannot afford to lose momentum. On the contrary, it has a unique opportunity to take a leading position, building on its strengths in the European way: a long tradition of industrial excellence, high-quality engineering, safety, reliability, and a collaborative innovation model that is recognised worldwide.

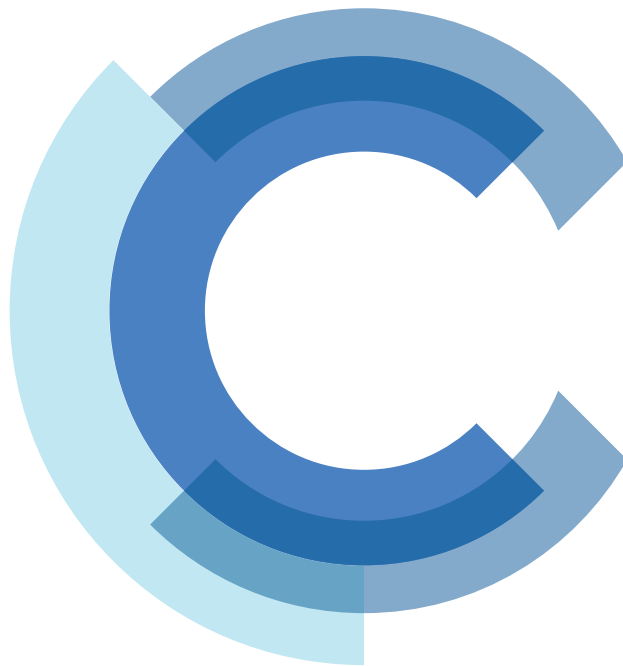
Looking ahead to the next Framework Programme (FP10), the priority is therefore clear. Having successfully delivered on research and validation objectives, the CCAM Partnership must now move decisively towards deployment. The focus must shift to scaling up solutions, accelerating market uptake, and enabling real-world implementation across Europe. This requires a stronger market-driven approach, closer integration with infrastructure and services, and a clear pathway from research to operation.

Large-scale flagship initiatives will be essential in this transition. By integrating and scaling existing results, these initiatives can demonstrate the full potential of CCAM in real operational conditions, unlocking industrial impact and supporting Europe's competitiveness. At the same time, continued investment in enabling technologies will be critical to maintain technological leadership.

The Partnership needs to keep a key role in shaping FP10, in close cooperation with the European Commission and other partnerships and relevant stakeholders. The objective is to place CCAM at the centre of the future mobility agenda, not as a complementary activity but as a core pillar of Europe's economic and technological strategy. Strengthened synergies with related initiatives, including those in energy, digital technologies and batteries, will further enhance this ambition.

In parallel, the Partnership will continue to deliver on its current commitments, including the implementation of upcoming work programmes and large-scale demonstrations, and the ongoing monitoring and evaluation of results. Engagement with cities and regions will be reinforced to ensure that technological advances translate into tangible benefits for citizens and communities.

In conclusion, the CCAM Partnership has demonstrated its capacity to deliver, to coordinate, and to create value at European level. It has successfully laid the foundations for automated mobility in Europe. The next phase must now build on these achievements to move towards deployment at scale. This is both a challenge and an opportunity. By acting decisively, Europe can secure its leadership in automated mobility, delivering safe, sustainable and innovative transport solutions, and reaffirming its position at the forefront of global technological progress.





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