CCAM

CONNECTED, COOPERATIVE & AUTOMATED MOBILITY

CCAM Association's vision for:

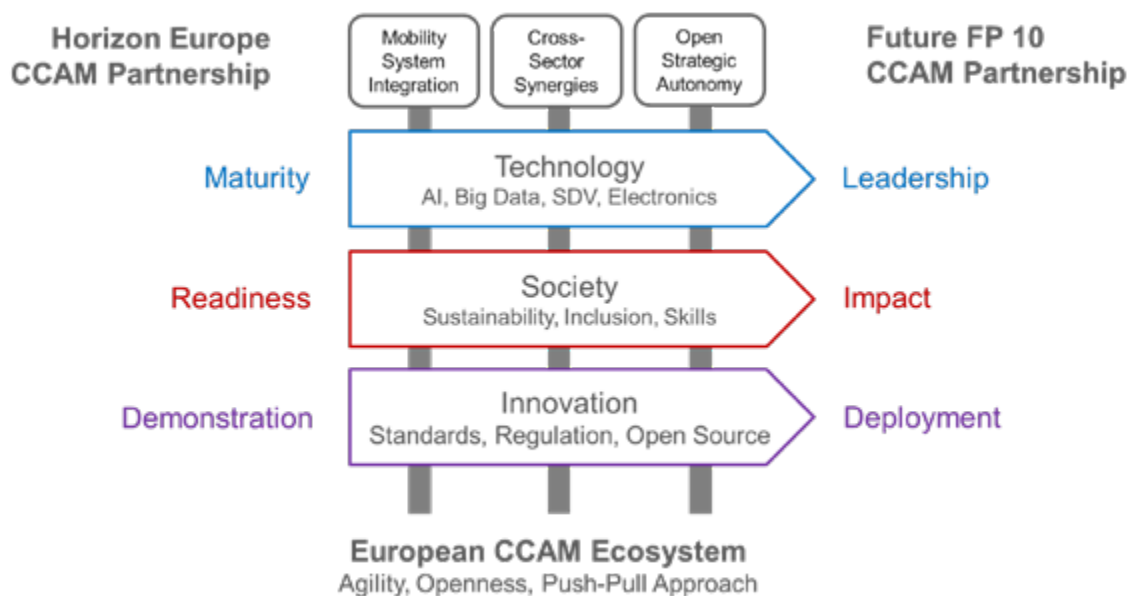# Future of the CCAM Partnership

under FP10

Introduction

The rapid advancement of connected, cooperative, and automated mobility (CCAM) presents Europe with critical opportunities and challenges. As the global race on leadership in CCAM intensifies, the need to strategically develop and widely deploy safe, sustainable, and inclusive CCAM system solutions has become urgent for the EU's competitiveness in the digital transformation of road mobility.

Building on the achievements of Horizon Europe, the CCAM Partnership under the forthcoming tenth Framework Programme (FP10) will seek to reinforce Europe's position in automated and connected mobility. It will address technological, societal, and industrial challenges through a cohesive, collaborative, and innovation-driven approach that is strategically open yet autonomous, firmly rooted in European values.

This concept paper outlines the strategic evolution of the current CCAM Partnership. Complementing the updated ERTRAC vision on road transport and anticipating an updated CCAM Strategic Research and Innovation Agenda (SRIA), it sets ambitious goals for technology development, standardisation, harmonised regulation and deployment, while ensuring that CCAM solutions address societal needs while maintaining EU's global competitiveness. At the same time, it highlights lessons learned from Horizon Europe (FP9), where the co-programmed CCAM Partnership has successfully aligned Europs's industrial, academic, and public efforts to advance technologies and deployment.

The in-depth analysis of this paper comprises context, achievements, governance, and strategic direction, concluding with risk mitigation strategies and key insights for the continued evolution of the CCAM Partnership.

1 | **Essential Idea:**

What the key role and strategic focus of the CCAM Partnership under FP10 will be in short.

The CCAM Partnership will remain central in advancing connected, cooperative, and automated mobility in Europe. By fostering a unified innovation ecosystem, it will drive technological excellence, societal benefits and readiness, as well as the skills needed for Europe's competitiveness in CCAM.

Through strategic programming, collaborative research, and large-scale demonstrations involving industry, academia, and civic stakeholders, the Partnership under FP10 will

- Develop technology, set standards, and accelerate the deployment of level-4 automated transport solutions for people and goods in and beyond urban areas as well as across borders.

- Drive excellence in AI, big data, and software-defined vehicles while fostering synergies with zero-emission road transport to deliver safer, greener, and more inclusive mobility solutions.

- Strengthen EU technological autonomy and sovereignty, ensuring leadership against large-scale CCAM deployment by non-European actors.

- Address societal mobility challenges, such as accessibility for ageing populations and underserved regions.

By combining technological innovation with societal impact, the CCAM Partnership under FP10 will promote energy-efficient mobility, sustainable business models, and regulatory harmonization, aligning with EU initiatives such as the Green Deal, the Digital Agenda, and the goals outlined in the Draghi Report and Competitiveness Compass. Building on its Horizon Europe legacy, the CCAM Partnership envisions a future under FP10 that will ensure synergy with other EU Partnerships, the Cities Mission, cohesion policies, Member States funding mechanisms such as an Important Project of Common European Interest (IPCEI) on "Clean, Connected and Automated Vehicles".

What you need to know about CCAM.

Industrial Competitiveness:

The evolution of the CCAM Partnership comes at a critical moment, as global leaders in the U.S. and Asia advance digitally enabled technologies like connected and automated vehicle technologies in rivalry. To stay competitive, Europe must leverage its industrial strengths, foster strategic autonomy, lead in shaping standards, drive innovation in key technological areas, and explore new opportunities to secure its place at the forefront of the evolving CCAM landscape.

Societal Benefits:

European innovation in CCAM goes beyond automated driving - it aims to create safer, greener, and more resilient transportation systems that address growing mobility demands, including those of an ageing population. CCAM development integrates systemic and societal needs, ensuring that mobility services are not only technologically advanced but also accessible and responsive to the needs of citizens, service providers and society as a whole.

Europe's Position and Future Prospects:

For decades, Europe has led in automotive safety and driver assistance systems, but increasing competition from the U.S. and China threatens its leadership due to cost and technology gaps in CCAM. This mirrors some other challenges in the sector, where a failure to scale up innovation resulted in declining competitiveness. To prevent a similar outcome, European industry, academy and governments are aligned in their ambition to develop safer, multimodal, shared, and more environmentally sustainable mobility solutions supported by digital technologies. A shift from a fragmented and uncoordinated tiered innovation chain to a - vertically and horizontally integrated - ecosystem-driven approach is essential for Europe to remain competitive.

Bottlenecks and Market Uptake Barriers:

Despite significant advancements, CCAM innovation in Europe faces major hurdles, including

- Slow progress in developing mature Level-4 automation solutions
- Reduced private R&D investment by European actors
- Difficulty competing with large-scale global R&D investments
- Fragmented coordination across innovation stakeholders
- Limited visibility of societal impact and weak, unclear demand
- Insufficient cross-border regulatory alignment
- Inadequate international collaboration frameworks
- Longer and more uncertain research timelines than anticipated.

Addressing these barriers requires stronger coordination, increased investment, and a unified approach to accelerating CCAM deployment across Europe.

3 | Necessity for a CCAM Partnership in FP10:

Why a follow-up activity of the CCAM Partnership is needed.

Alignment with the Draghi Report and the Competitiveness Compass

A European CCAM Partnership under FP10 will align with the EU's Green Deal and Digital Agenda by promoting sustainable and inclusive mobility solutions that enhance safety, efficiency and accessibility. Reflecting the priorities outlined in the Draghi Report and the proposed Competitiveness Compass, it will strengthen EU competitiveness in the automotive sector by promoting affordable mobility, targeted re-skilling initiatives, and streamlined regulatory frameworks. By reducing transformation costs through energy efficiency and automation, fostering digital innovation such as software-defined vehicles, improving digital infrastructure and enhancing interoperability standards, the future CCAM Partnership thus directly addresses the gaps in competencies and cost identified in the Draghi report.

Strategic Autonomy and Resilient Leadership:

The rapid rise of dominant tech companies outside Europe threatens to reshape mobility ecosystems, with a far-reaching foreign influence on market power, user data ownership, and user behaviour in various contexts. These companies could control transport and mobility platforms, CCAM services, offered on these platforms and the intelligence embedded in vehicles and infrastructure elements operated by these services, leading to significant economic, political, and security risks for the EU. By fostering a cohesive CCAM ecosystem, the EU will be able maintain its strategic autonomy, shape international standards, and assert its technological sovereignty in a highly competitive global landscape. Unlike markets dominated by either rigid, top-down connected and controlled automation models or fully AI-driven vehicles prone to dangerous driving decisions, accidents, or system failures e.g. due to hallucination, the CCAM Partnership under FP 10 will champion reasonable combinations of cloud and vehicle based intelligence as well human-centric and socially responsible solutions that reflect European needs and values. Bringing together industry, academia, SMEs, road authorities, transport providers, and civic stakeholders, the Partnership will define viable pathways and programmes for resilient mobility innovation. Through strategic collaborations with like-minded global partners, the EU shall actively set trends rather than follow them.

Greening of Road Transport through Automation:

A CCAM Partnership under FP10 will be essential to addressing the twin challenge of greening and automation of road transport. While automation can reduce emissions by promoting smoother driving and optimising traffic flows, it also increases the energy demands through control systems, AI operations, and data processing. A balanced approach is needed to ensure that net energy consumption aligns with the EU's climate goals. Key focus areas will include assessing the environmental impact of CCAM technologies, exploring the relative benefits of shared versus individual mobility in lowering per-capita emissions and minimising the energy footprint of digital and AI-driven CCAM solutions. By integrating sustainability into automation, the CCAM Partnership will define strategies that maximise efficiency and minimise environmental impact, while offering support and convenience at an individual level.

Harmonisation of Automated Road Transport Systems:

A coordinated European approach is essential to overcoming fragmentation in automated road transport. The CCAM Partnership will be able provide a framework for Member States to co-develop, align, and implement common standards, ensuring seamless integration of resilient CCAM systems across Europe. Key benefits of a harmonised system include reduced regulatory complexity while advancing public benefits and acceptance through accessibility and inclusion, facilitating cross-border mobility through shared testing and validation procedures and accelerating CCAM deployment by aligning data protocols, infrastructure readiness, and investment strategies. Through coordinated efforts with national and regional authorities, the Partnership will ensure de-risking of investments and acceleration of CCAM deployment from lab to market, benefitting the entire continent under FP10.

Ensuring Cohesion and Inclusivity:

Coordinated infrastructure investment, knowledge exchange, and technology diffusion enable the widespread adoption of CCAM solutions across diverse geographies. Therefore, a broad, inclusive Partnership is crucial to equitable innovation in CCAM. By linking to EU cohesion policy, the CCAM Partnership under FP10 will ensure that innovation is equitable, benefiting both urban and rural areas.

Skills and Workforce Development:

The CCAM Partnership under FP10 responds to the need for new skill sets and workforce training. As cutting-edge technologies evolve, upskilling and reskilling will be needed at all levels of the CCAM ecosystem. The cross-functional nature of the Partnership allows for identifying actions that ensure that Europe's labour force and skills remain adaptive, capable, and aligned with future competence demands, ultimately strengthening the region's innovation capacity and industrial resilience.

4 | Prior Achievements:

What the future of the CCAM Partnerships can build upon.

Uniqueness of the European approach:

The European CCAM approach, championed by the CCAM Partnership, is defined by a balanced socio-technical framework that integrates cutting-edge technical advancements - such as environment perception, AI-driven decision-making, and remote management - with a strong focus on societal readiness and inclusivity. This ensures that innovation is both technologically robust and aligned with European values, while fostering trust, public acceptance, and sustainable deployment of connected and automated mobility solutions.

Strengthening the CCAM Community:

The co-programmed CCAM Partnership under Horizon Europe has cultivated an increasingly integrated innovation community by aligning a broad spectrum of stakeholders, including research institutions, industry leaders, road authorities, and service providers. In just three years, it has brought together a diverse ecosystem of over 200 entities, fostering knowledge sharing, new value chain structures, and strategic networks. This collaborative foundation positions Europe for long-term leadership in advanced mobility technologies.

Foundations for Large-Scale Demonstrations and Harmonised Evaluation:

A critical milestone of the CCAM Partnership is the establishment of largescale demonstrations that showcase the transformative potential of CCAM. By implementing harmonised testing procedures and a common evaluation methodology, the Partnership ensures consistent, reliable, and scalable assessments, facilitating widespread deployment and long-term impact across Europe.

Legacy of Horizon 2020 and Horizon Europe Projects:

Building on the successes of Horizon 2020 and the current Horizon Europe Programme, the CCAM Partnership leverages key insights from previous framework programmes to strengthen strategic innovation planning and implementation of connected and automated mobility solutions. The Staff Working Document of the European Commission highlights its role in applying proven best practices, ensuring effective funding allocation, accelerated systemic transitions, and a robust foundation for multi-annual collaborative research projects in both industrial and societal CCAM innovation.

Impact and International Visibility of the CCAM Partnership:

Despite still being in its early stages, the CCAM Partnership under Horizon Europe has initiated cutting-edge research aligned with societal needs, earning high international recognition for the EU's strategic leadership approach. Its full impact will become evident as first projects conclude around mid-2025, demonstrating the potential of CCAM to enhance safety, sustainability, inclusivity, resilience and European industrial competitiveness.

5 | Future Vision, Objectives, and Added Value

Where we want to go with CCAM under FP10 and why.

Vision for CCAM in 2035 and Beyond:

The European vision for CCAM is a seamlessly integrated, connected, cooperative, and automated mobility system for both people and goods. By harnessing innovation across academia, industry and society, it seeks to establish the most comprehensive, equitable, and future-proof mobility framework, positioning Europe as a global leader in next-generation mobility solutions.

General Objectives:

The CCAM Partnership aims to facilitate a safer, more secure, and more sustainable road mobility system that is affordable, inclusive, user-centric, and resilient. This includes addressing the needs of an ageing society and underserved regions, while simultaneously regaining and strengthening Europe's global leadership, technological sovereignty, and competitiveness in strategic CCAM technologies and applications. By fostering a vibrant, continent-wide ecosystem, the Partnership ensures that CCAM development reflects European values, diversity and socio-technical balance.

Specific Objectives:

The CCAM Partnership under FP10 will:
- Advance Level-4 automation systems to EU-wide Operational Design Domains (ODD)
- Ensure harmonised EU-wide mobility frameworks
- Develop cross-sectoral value chains for fully integrated CCAM solutions and services
- Expand large-scale demonstrations to accelerate broad CCAM deployment and use cases
- Enhance societal readiness
- Develop long-term strategies and systemic solutions for CCAM adoption

Operational Objectives:

To drive CCAM maturity and widespread adoption, the Partnership will:
- Leverage software-defined vehicles, centralized electronics, AI, big data, and robotics
- Combine just the right level of connectivity needed and vehicle autonomy possible
- Expand and interconnect large-scale demonstrations across Europe
- Enhance supporting physical and digital infrastructure for CCAM deployment
- Develop standardized interfaces to ensure interoperability
- Create viable business models for sustainable mobility services
- Support diverse use cases, such as medical care and transport solutions for rural areas
- Apply common data spaces and open source software solutions.

Expected Impacts in Multiple Dimensions:

CCAM advancements under FP10 will have far-reaching benefits:
- Safety: AI-driven automation will reduce road fatalities and improve traffic management
- Energy Efficiency: Smarter mobility will optimize consumption and reduce emissions
- Technology Leadership: Convergence of automotive electronics, AI, and data-driven innovation will strengthen Europe's position as a leader in next-generation mobility solutions
- Economic Growth: Cross-sector innovation will boost industrial competitiveness, create new markets, and reinforce Europe's research and innovation ecosystem
- Societal Benefits: Relevant, affordable, integrated and inclusive CCAM services will enhance accessibility and user trust, driving broader adoption of advanced mobility solutions

Synergies through a strong Collaboration Framework:

Under FP10, the CCAM Partnership will cultivate strategic synergies with complementary research domains, ensuring coordinated efforts and efficient resource allocation. Key areas of collaboration include:

- Energy-efficient vehicle systems
- Zero-emission road transport
- AI, big data, and robotics in mobility applications
- Software-defined vehicles and next-generation, centralised electronic systems
- Climate-neutral and smart cities

By integrating these efforts, the CCAM Partnership will accelerate transformative mobility innovations while ensuring their alignment with societal and environmental goals.

Bidirectional Synergies with IPCEI:

Building on the Joint European Forum on IPCEI's prioritisation of "clean, connected, and automated vehicles", a future Important Project of Common European Interest (IPCEI) could serve as a bridge between innovation and first industrial deployment through dedicated Member States' funding. While setting-up an IPCEI takes significant time and effort, this relationship could be mutually reinforcing: while the IPCEI would accelerate commercialization and market deployment of CCAM innovations, the CCAM Partnership could ensure EU-wide spillover effects enhancing research, standardisation, and ecosystem development.

Engagement with Global Partners while Maintaining Strategic Autonomy:

The CCAM Partnership will develop agile and adaptive strategies to engage with global partners while safeguarding Europe's technological sovereignty. Drawing on insights from EU-funded Future Horizon and STREnGTh-M projects, these strategies will span a flexible spectrum—from policy recommendations that shape international regulations to industry-led initiatives that foster targeted yet strategic collaborations at project and programme levels.

6 | Governance, Partner Composition, and Stakeholder Engagement

How the CCAM Partnership may be organised in the future.

Collaborative Governance Approach:

The current CCAM Partnership under Horizon Europe upholds transparency, accountability, and long-term sustainability through an expert-led governance model within and among thematic clusters. This structure fosters cross-cutting collaboration, inclusive participation, and efficient operations, supported by a dedicated secretariat for professional association management. Key governance principles include:

- Thematic cluster leadership to integrate expertise across focus areas
- Regular updates to the Strategic Research and Innovation Agenda (SRIA) to adapt to evolving priorities
- Smooth leadership transitions to ensure continuity and adaptability
- Consistently engaged stakeholders through active communication and participation

A future CCAM Partnership under FP10 would benefit from a similarly agile, transparent, and collaborative governance model, reinforcing its ability to respond to technological, societal, and regulatory developments effectively.

Diversity of Partnership Membership:

Since its launch, membership in the CCAM Partnership association has grown significantly, increasing from 170 to 230 members by 2024, with 26% joining after 2021. This growth highlights the value of active networking and engagement opportunities, while strong advocacy efforts attest to the Association's appeal, making the Partnership an attractive platform even for non-members participating in funded projects. Notably, SMEs are well-represented: they make up 17% of the Association and account for 43% of the companies involved in CCAM projects — a higher participation rate than in any other co-programmed Partnership.

Strengthening Member State Involvement and Coordination:

Building on the States Representatives Group (SRG) established under Horizon Europe, a future CCAM Partnership under FP10 will focus on deepening programmatic alignment and complementarity with Member States.

7 | Risk Analysis

What could go wrong.

Without a CCAM Partnership under FP10, Europe risks falling behind in innovation, standardisation, and deployment of connected, cooperative and automated road mobility. This would weaken economic resilience, hinder sustainability goals, and compromise strategic autonomy. Additionally, it could strand nearly one billion Euro in public and private investments made under Horizon Europe, disrupting the new value chains and collabrations established.

Even with a CCAM Partnership under FP10, risks need to be carefully assessed and mitigated:

Risk	Severity	Probability	Mitigation Action
Technology & Infrastructure Readiness Gaps	high	medium	Increase funding for R&D and testbeds as well as investments in infrastructure
Slow Market Uptake & Limited Demand	high	medium	Conduct large-scale public pilots and provide incentivised services
Regulatory & Policy Misalignment	high	medium	Establish fast-track regulatory pathways and sandboxes, using capacity of the SRG
Limited Societal Acceptance	high	high	Organize public engagement campaigns and safety demonstrations
Skills & Workforce Gaps	medium	medium	Facilitate the creation of CCAM-related public re- and upskilling programmes
Weak Collaboration Across Stakeholders	medium	medium	Use FAME & CCAMbassador projects and keep Partnership governance agile
Loss of EU Technological Sovereignty	high	medium	Strengthen EU CCAMecosystem and focus public procurement on EU
Insufficient Funding & Investment	high	medium	Align EU and national funding programmes and encourage private investments

What this paper has covered.

The CCAM Partnership has successfully brought together a diverse set of stakeholders, creating a cohesive, cross-sector innovation ecosystem that strengthens Europe's position in connected, cooperative, and automated mobility (CCAM). By reducing fragmentation, articulating a clear vision, and raising awareness among policymakers and the public, the Partnership has laid strong foundations for the next phase of CCAM development.

In view of the ever-increasing competitive pressure from outside Europe, under FP10, Europe must advance from large-scale demonstrations to full integration of CCAM solutions within transport systems and society. This next stage will focus on:

- Achieving maturity of Level-4 for EU-wide ODD
- Harnessing AI, big data, and robotics to optimize mobility efficiency
- Strengthening industrial leadership in software-defined vehicles
- Enhancing interoperability and harmonization of regulatory frameworks
- Developing societal readiness for, and of, CCAM
- Supporting skills development and workforce adaptation
- Promote open-source approaches for software and data

By maintaining strong public and private investment and strategic direction in research and innovation, the CCAM Partnership can ensure that Europe remains competitive, safeguards its technological sovereignty, and effectively addresses societal challenges such as ageing populations, underserved regions, and environmental sustainability. The integration of new enabling technologies through a push-pull approach will accelerate CCAM's broad deployment, ensuring it delivers tangible benefits for safety, inclusivity, and sustainability.

Looking ahead, continued commitment from the EU and industry, academia, transport operators as well as Member States is essential to securing leadership in next-generation CCAM solutions.