RTR CONFERENCE

CONFERENCE

RESULTS FROM ROAD TRANSPORT RESEARCH

Summary Report
#RTR2026 Conference

10th - 12th February 2026
Brussels

With the support of

BATT4EU Batteries European Partnership

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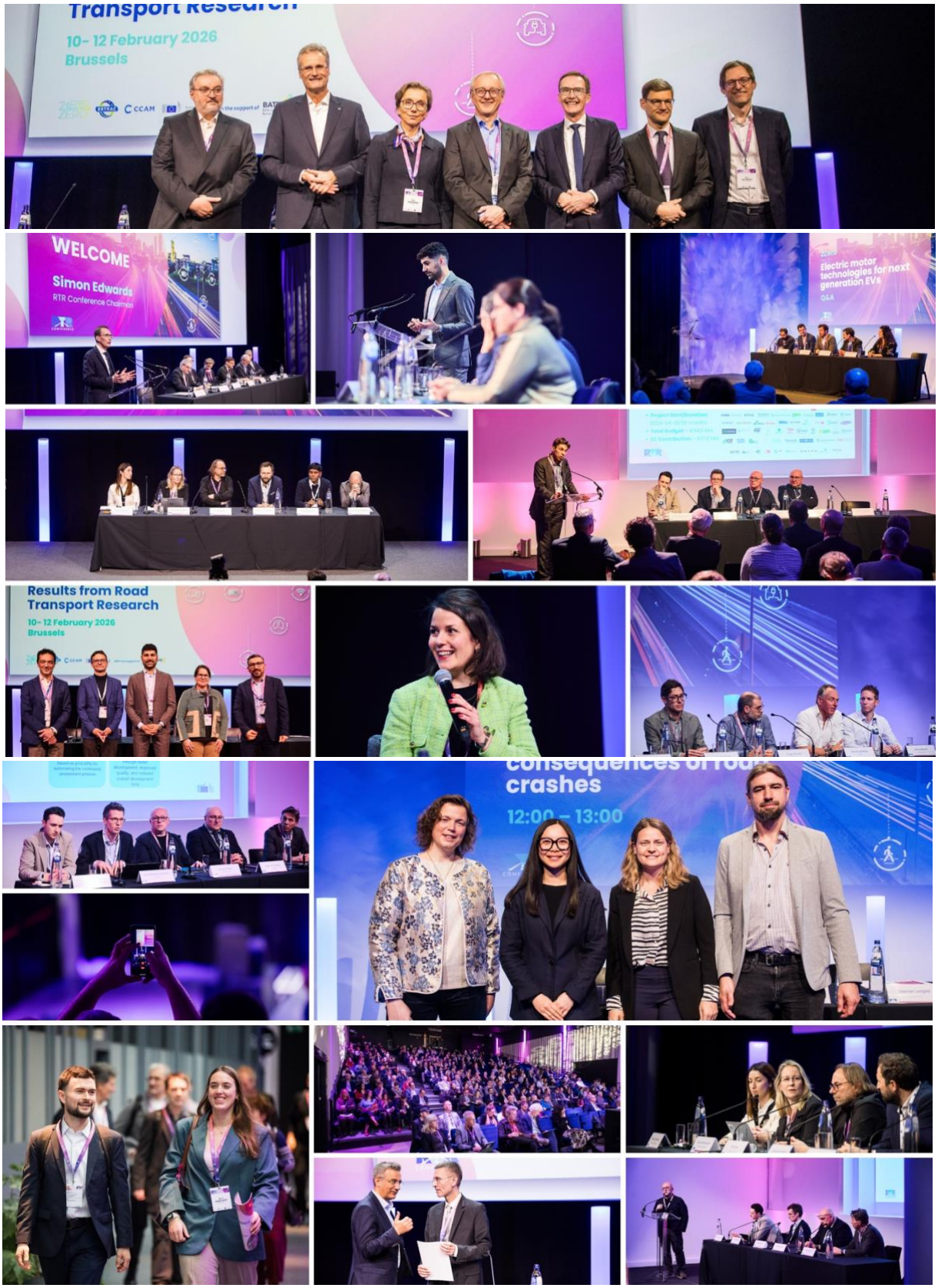

10- 12 February 2026
Brussels
WELCOME
Simon Edwards
RTR Conference Chairman
Electric motor technologies for next generation EVs
Q&A
Results from Road Transport Research
10- 12 February 2026
Brussels
crashes
12:00 – 13:00

INTRODUCTION

The 9th edition of the European Conference on the Results from Road Transport Research (#RTR2025) took place from the 10th to the 12th of February 2026. Once again, more than 1000 participants joined the conference, on-site in Brussels and online, to listen to the presentations from 92 projects across 32 sessions.

The presentations gave the final outcomes from the last RTR Horizon 2020 projects, providing a glimpse into a promising future for a more sustainable, integrated and digital road mobility. Furthermore, attendees were introduced to new results from many, running Horizon Europe funded projects.

In addition to the standard programme, featuring activities related to road transport safety, logistics, urban mobility and infrastructure, projects from the co-programmed partnerships "Towards Zero Emission Road Transport Partnership" (2Zero), "Connected, Cooperative and Automated Mobility Partnership" (CCAM) and the "Batteries for Europe Partnership" (Batt4EU) were invited.

For the first time, the conference also featured projects beyond research and innovation, with a specific session dedicated to the European Innovation Council (EIC) which supports research results being brought to the market.

In this Summary Report, the moderators of each session briefly introduce the key outcomes highlighted by each project's representative and provide a summary of the discussions and conclusions from their session. If you want to deep-dive into the session content, we invite you to watch the recording of each session, which is easily accessible by clicking on the YouTube logo next to the session title.

We wish you a good read and hope to see you at the next edition of the Road Transport Research conference, starting on the 23rd of February, 2027.

Simon Edwards
RTR Conference Chair

Parallel session 1:
Predictive safety assessment framework and safer urban environment for vulnerable road users

SUMMARY BY MAGNUS GRANSTRÖM (CHALMERS)

Introduction

The topic of this session was predictive safety assessment frameworks and safer urban environment for vulnerable road users. The expectations in the call from 2022 were the following: to implement a Safe System approach, prioritising safety for all road users and stakeholders; to develop predictive frameworks and virtual models to assess future road safety scenarios and impacts; and to enhance urban safety for vulnerable road users through infrastructure, education and innovative transport solutions.

Three projects were presented in the session, all of them finished or close to be finalised.

Projects

The **V4Safety project** (*Vehicles and VRU Virtual eValuation of Road Safety*) has focused on the establishment of a widely accepted and harmonised predictive assessment framework for road safety, including models that can describe the behaviour of drivers, vehicle occupants and VRUs: one very important task has been to define and agree on a method for capturing and describing the baseline. Among the results, we find: an interactive tool: V4SAFETY Processor, V4SAFETY models on OpenVTplatform, validation and verification check cards, cost-benefit analysis tool, an evaluation scope tool and a baseline approach tool.

The **PHOEBE project** (*Predictive Approaches for Safer Urban Environment*) aims to increase the road safety of vulnerable road users, especially those who use active mobility and e-scooters. This is achieved through the inter-disciplinary power of traffic simulation and road safety assessment. Three use cases/pilots have been used in the project: Athens (focus: enhanced VRU space and speed management actions), Valencia (dedicated bicycle

corridors) and West Midlands (reallocation of road space to cycling and e-scooter use and encouragement of modal shifts).
Some key findings: Reclaiming pedestrian space and having dedicated, bus and bike lanes significantly improves safety as well as encourages modal shift. Differential speed limits for different lanes can be a useful method. The use of infrastructure assessment tools, such as CycleRAP and iRAP, make the analysis more rigorous and replicable.

The **SOTERIA project** (*Systematic and orchestrated deployment of safety solutions in complex urban environments for ageing and vulnerable societies*) has had, as its primary aim, to accelerate the attainment of the Vision Zero EU goal for vulnerable road users, through a holistic framework of innovative models, tools and services that enable data driven urban safety intelligence, facilitate the safe travelling of VRUs and foster the safe integration of micro-mobility services in complex environments. SOTERIA has used four cities for living labs: Oxfordshire & Wolverhampton (safe and inclusive integration of micro-mobility to current mobility paradigms), Saxony (VRU safety applications for generation Z), Madrid (safe and shared mobility services for improving user well-being and clean urban environment), Chania/Igoumenitsa (proactivity-based and micro vehicle centric measures for unprotected road users).
Among the results, these are some examples: integration of an immersive Virtual Reality module into Fraunhofer IVI Accident Prevention School, modernising road safety education for pupils aged 10-16, established a comprehensive framework for safer urban environments, integrating data spaces, predictive analytics, behavioural tools and user-centric services, and showcasing a mobile application for VRUs, delivering personalised, context-aware safety information directly to cyclists and micro-mobility users.

Summary

We are continuously learning more and more in this field: end user engagement is crucial in order to find suitable long-term solutions that are desirable both from an urban planning and user perspective. The three projects have a close collaboration under the umbrella of the Road Safety Cluster, comprising a collection of (today) 11 projects that are advancing road safety through data. A joint paper has been published and was presented at the conference.

Parallel session 2:
New delivery methods and business/operating models to green the last mile

SUMMARY BY YANYING LI (ALICE)

Introduction

The session titled "**New delivery methods and business/operating models to green the last mile**" brought together experts to discuss the evolution of urban logistics. The session showcased three major projects: URBANE, DECARBOMILE and GREEN-LOG; each of them aiming to create sustainable last-mile ecosystems through systemic changes.

Projects

The **URBANE project** (*upscaling innovative green urban logistics solutions through multi-actor collaboration and pi-inspired last mile deliveries*) focuses on upscaling green urban logistics by transitioning from siloed to collaborative operations based on Physical Internet principles. Key achievements include the demonstration of collaborative micro-hubs, locker networks and delivery using robots or PV-powered cargo bikes. These physical interventions, combined with digital innovations such as a transferability platform and a smart contract generator, have led to measurable impacts, such as a reduction in CO_2 emissions of over 20% across its demonstrators. URBANE's long-term vision involves a path to wider replication through policy packages and city platforms.

DECARBOMILE (*Five pillars to DECARBOnize the last MILE logistics*) presented its results from four living labs and ten use cases that tested solutions such as load pooling, shift to cycle and river-to-cycle multimodal logistics. The project's ICT tools have shown strong potential, including a 20% reduction in fleet usage through load optimisation and dynamic routing, as well as over 93% accuracy in forecasting tools. DECARBOMILE has already reached high technology readiness levels (TRL 8-9) for three of its innovations and plans to release a replication guidebook in August 2026 to support local policies and investments.

GREEN-LOG (*Cooperative and Interconnected Green delivery solutions towards an era of optimized zero emission last-mile Logistics*) emphasises cooperative and interconnected delivery solutions, specifically exploring the Logistics-as-a-Service (LaaS) model. In the Athens Living Lab, shared logistics led to a 35% reduction in total distance and a 26% reduction in delivery time. Other pilots validated human-robot multimodal delivery chains and autonomous-ready mobile delivery hubs. Notably, dynamic pricing in Flanders reduced van delivery tours by 47%. Discussion points during the session highlighted that, while user acceptance for sustainable delivery is high, with 92% favouring sustainability insights, challenges remain regarding the economic sustainability of new jobs created by these models due to low delivery margins.

A major outcome of these projects is the increased visibility and physical presence of logistics in city planning. The projects have successfully proven the benefits of full integration of urban planning and management with considering logistics needs. This is evidenced by the shift toward securing more dedicated urban space for logistics, such as micro-hubs and optimized loading bays, and the transition to right-sized vehicles such as cargo bikes. This shift is supported by the adoption of shared facilities and space, allowing multiple operators to consolidate efforts and reduce the overall footprint of delivery activities. Furthermore, the transition to "right-sized" vehicles—such as cargo bikes and automated delivery droids—has proven essential in reducing congestion and emissions while maintaining service efficiency.

Conclusion

The concluding discussions highlighted the complexities of data sharing and multi-party cooperation. A key challenge remains how to share essential planning data with cities without exposing the confidential commercial information of private operators. Participants emphasized the need for "data sovereignty" and neutral orchestration to build trust. By establishing frameworks for cooperation among private companies and between the public and private sectors, these projects have laid the groundwork for a more integrated, efficient and future-proof urban freight landscape.

Parallel session 3:
Electric motor technologies for next generation EVs

SUMMARY BY GORDON WITHAM (IKA RWTH-AACHEN)

Introduction

The session "**Electric motor technologies for next generation EVs**" took place during the RTR Conference 2026 and focused on advanced traction motor concepts addressing efficiency, power density, cost and circularity challenges in battery electric vehicles. Electric machines are central to the objectives of the 2Zero Partnership, notably the development of affordable zero-emission vehicles with improved energy efficiency and reduced dependency on critical raw materials, as set out in the SRIA. In the broader context of the Clean and Digital Transport Transition, next-generation e-motors are pivotal for increasing vehicle range, lowering lifecycle emissions and costs, and strengthening European resilience in strategic value chains, particularly regarding rare earth elements. The session highlighted how integrated design approaches are enabling step changes in motor traction while supporting circular economy principles.

Projects

The **EM-TECH project** (*Innovative e-motor technologies covering e-axles and e-corners vehicle architectures for high-efficient and sustainable e-mobility*) addressed innovative e-motor technologies for both e-axle and e-corner architectures. The project aimed to develop highly efficient and cost-competitive in-wheel and on-board axial flux motors with significantly reduced rare earth content and full consideration of lifecycle impacts. For the radial flux in-wheel motor, EM-TECH demonstrated a 15% increase in torque density to 44.5 N.m/kg and an 86% power increase compared to the baseline, while reducing heavy rare earth content by 39%, surpassing the 20% target; the bill-of-material cost reached 5.73 €/kW, below the 6 €/kW target. The axial flux motor achieved 10.15 kW/kg and 33 kW/l, exceeding the respective 10 kW/kg and 30 kW/l targets, while reducing magnet mass by 60.1% and limiting heavy rare earth content to 0.5%, slightly above the 0.3% target; a

cost of 3.9 €/kW was reported against a target of <5 €/kW. These results were validated through a combination of digital twinning, distributed X-in-the-loop (XiL) testing across multiple laboratories, and experimental test bench validation of full prototypes, including advanced control strategies such as virtual temperature sensing and AI-based traction control. The expected impact is the market introduction of highly efficient, affordable motors with 20–25% loss reduction along driving cycles and substantially lower critical material dependency. The project directly contributes to 2ZERO objectives on efficiency gains, cost reduction and circularity, while strengthening European competence in advanced motor architectures.

The **HEFT project**'s (*Novel concept of a low cost, high power density and highly efficient recyclable motor for next generation mass produced electric vehicles*) overarching objective is to develop a low-cost, high power density and highly efficient recyclable motor concept for mass-produced electric cars and vans, while establishing resilient strategies to mitigate rare earth supply risks. HEFT designed and prototyped motors for two vehicle segments (A+B, C+D+E), achieving gravimetric power densities of 7.32 kW/kg and 7.03 kW/kg in the respective configurations. Compared to benchmark motors (FIAT 500e and VW ID.4), weight savings of around 60%, volume reductions up to 43%, and rare earth reductions of 58–60% were demonstrated, alongside continuous torque density values of 34.25 N.m/kg and 44.74 N.m/kg, well above the call target of 20 N.m/kg. The project also implemented automatic continuous winding manufacturing, oil cooling concepts eliminating water jackets, fibre-reinforced plastic housing for weight reduction, and digital twin models for thermal characterization to prevent premature ageing. A dedicated dismantling process was validated, involving thermal degradation of adhesives at 300°C followed by mechanical magnet extraction, enabling both direct reuse and recycling into new N38H-grade magnets. Results were obtained through prototype manufacturing, comparative benchmarking against reference motors, laboratory validation and lifecycle-oriented assessment. The expected impact includes more than 25% motor cost reduction, 20% loss reduction, and significant improvements in recyclability and circular magnet flows, contributing directly to 2ZERO KPIs on efficiency, cost and reduced critical raw material use.

The objective of the **VOLTCAR project** (*Design, manufacturing, and validation of ecocycle electric traction motor*) project is to create highly compact and efficient high-speed permanent magnet synchronous reluctance motors (PMSynRM) for 50–120 kW applications, reducing NdFeB magnet use by more than 60% while enabling reuse and achieving at least 65% recyclability at competitive mass-production costs below 6 €/kW. VOLTCAR developed radial flux high-speed motors rated up to 120 kW continuous (210 kW peak), operating at up to 30,000 rpm and 800 V, integrating direct liquid cooling, hairpin windings with innovative insulation, quasi-skewing and varnish-baked lamination stacks. Both 50 kW and 120 kW prototypes successfully passed rotor spin tests up to 36,000 rpm over 350 hours, validating mechanical integrity and safety margins. Digitalized

motor models were used to assess thermal behaviour during WLTP cycles, and vibro-acoustic modal analysis was performed to validate stator dynamics. An eco-design approach demonstrated magnet extraction from end-of-life motors and pathways for direct reuse or remanufacturing with optional blending. The expected impact is a 20% loss reduction, substantial rare earth savings, and the deployment of circular magnet strategies that shorten recycling routes and improve resource security. VOLTCAR supports 2ZERO objectives on efficiency, cost competitiveness and circularity, while reinforcing European industrial capacity in high-speed motor technologies.

Conclusion

Following the presentations, an extensive and lively discussion ensued. The **Q&A session** started with a summary of the biggest achievements in the projects since the previous RTR Conference. As all projects are either finalized or on their final stretch, the focus was mainly on integration and validation of the developed concepts. The session centred on the technical maturity, industrial scalability and business viability of next-generation electric motor technologies, with discussions spanning virtual sensing and model-based validation, system-level optimisation of motor-gearbox configurations for specific duty cycles, lightweight and integrated housing concepts, and advanced cooling strategies to enable high continuous power density. A significant focus was placed on circularity of permanent magnets, including both recycling and direct reuse routes, material substitution to reduce critical rare earth dependency, and the practical challenges of ensuring consistent supply and performance at scale. Manufacturing readiness emerged as a key theme, particularly automation of winding, insulation and assembly processes, as well as cleanliness and integration constraints linked to novel cooling concepts. Finally, the discussion addressed exploitation pathways and business cases, highlighting opportunities in scalable manufacturing technologies, digital engineering tools, circular material value chains and system integration, while acknowledging that large-scale industrial deployment will require coordinated ecosystem development beyond technical validation alone.

Parallel session 4:
Streamlined collection and reverse logistics for batteries

SUMMARY BY JOAN GOZALEZ FABRA (BEPA)

Introduction

The session on "**Streamlined Collection and Reverse Logistics for Batteries**" focused on one of the most pressing challenges of Europe's battery ecosystem: how to streamline the safe, efficient and economically viable reverse flow of batteries used in electric vehicles. As electrification accelerates, increasing volumes of end-of-life (EoL) will require advanced solutions for collection, diagnostics, repurposing, reuse and recycling. The topic is directly aligned with the objectives of the Batt4EU Partnership, particularly regarding circularity, sustainability, digitalisation and safety across the battery value chain, as defined in its Strategic Research and Innovation Agenda (SRIA). Ensuring high-value recovery, extending battery lifetimes through second and third life applications, and enabling data-driven decision-making are essential to strengthening Europe's competitiveness and strategic autonomy, reducing raw material dependency, and meeting climate objectives. The session brought together four Horizon Europe projects funded by Batt4EU, addressing these challenges from complementary technological and systemic perspectives.

Projects

The **BatteReverse project** (*A next-generation automated, connected, and standardized process for increased safety, efficiency and sustainability of Li-ion BATTEry REVERSE logistics*) presented by Maarten Buysse, aims to develop a next-generation automated, connected and standardised system to improve the safety, efficiency and economic viability of battery reverse logistics. Its objectives focus on faster State-of-X assessment, automated dismantling, enhanced safety solutions and secure data sharing to enable profitable circularity.

The project has developed and validated a battery discharging solution combining testing and energy recovery, including upgraded hardware and software for parameter extraction and balancing. For diagnostic validation, nine modules from a Škoda pack were characterised in climatic chambers and aged down to 78% State-of-Health to build a diverse dataset.
On the logistics side, an XL transport box for large EV batteries has been approved for 60 kW.h packs, with further validation ongoing for higher capacities (98 kW.h). A prototype monitoring system with sensor modules and an IoT alert platform was developed for defective batteries. The project also introduced an interoperable battery data model compatible with initiatives such as Battery Pass and Catena-X, alongside a secure data space prototype enabling controlled data exchange.
BatteReverse demonstrates how integrated diagnostics, automation and digital infrastructure can increase safety and efficiency in reverse logistics, directly supporting Batt4EU objectives on circularity, digitalisation and lifecycle sustainability.

The **REBELION project** (*Research and development of a highly automated and safe streamlined process for increased Lithium-ion battery repurposing and recycling*), presented by Javier Romojaro, aims to develop a highly automated and safe process for battery repurposing and recycling. Its objectives include fast and reliable State-of-Health (SoH) assessment, semi-automated disassembly, safer logistics solutions and digital battery information management to support scalable circularity.
A key achievement is the development of a two-step fast diagnostic method addressing the limitations of conventional SoH testing. A 7-minute screening test separates functional from non-functional cells, followed by a 6-minute Electrochemical Noise Analysis-based diagnosis achieving approximately 2% SoH estimation error using low-cost equipment. This enables efficient sorting for second-life assembly, with extension to module level in progress. Disassembly processes were optimised despite high design variability and residual energy, reaching around 35 minutes per module, with automated identification, classification and full process-level traceability.
At pack level, robotic disassembly supported by digital twins and computer vision successfully demonstrated pack opening and module extraction, including human–robot collaboration. To mitigate thermal runaway risks during transport and storage, the project developed a hybrid safety system integrated into a standard ADR battery box, combining insulation, gas and thermal sensors, and active extraction. A QR-based Digital Battery Passport aligned with ESPR requirements enables end-to-end traceability and accessible technical and safety information.
REBELION contributes to Batt4EU objectives on safety, circularity and digitalisation by enabling faster diagnostics, safer handling and scalable second-life deployment.

The **REINFORCE project** (*Standardised, automated, safe and cost-efficient processing of end-of-life batteries for second and third life re-use and recycling*), presented by Emanuel Lourenço, aims to establish standardised, automated, safe and cost-efficient processes

for second- and third-life reuse, repurposing and recycling of end-of-life batteries. Its objectives cover integrated process design, harmonised diagnostics, automated disassembly validated at TRL 6, and the development of circular business models.
A central outcome is a six-step strategic decision framework defining SoH ranges for second life (60–80%) and third life (40–60%) applications, enabling structured end-of-life decision-making. The project achieved fast preliminary diagnostics with a 10-minute ML-based protocol reaching 1.19% SoH error, reducing testing time by 75%, alongside a module-level assessment tool delivering over 45% faster classification. Safety innovations include the Buncker© system, successfully tested with a 90 kW.h battery under extreme conditions, significantly reducing transport risks through smart detection and suppression.
On the automation side, REINFORCE developed flexible robotic cells with 3D scanning and automated path planning, automating around 90% of labour-intensive disassembly tasks, supported by fire-aware workstations and multi-level safety procedures. A second-life energy storage system demonstrator (87.6 V, 19.2 kW.h) validated reuse pathways. Complementing the technical work, the project mapped the EU circular battery value chain and developed digital platforms to simulate second- and third-life business models across regions. Sustainability assessment showed that repurposing can reduce global warming potential by 5–26%, compared to 2–7% from recycling alone, although current market conditions still favour recycling over reuse.
REINFORCE strongly contributes to Batt4EU objectives on circularity, safety and sustainable lifecycle management by combining technical validation, digitalisation and business-model innovation.

The **RECIRCULATE project** (*Reuse of batteries through characterisation, smart logistics, automated pack and module dismantling and repackaging and a blockchain enabled marketplace*), presented by Tomi Pitkäaho, aims to enable large-scale battery reuse through advanced characterisation, automated dismantling, smart logistics and a blockchain-backed marketplace. Its work spans six key pillars: SoX diagnostics, AI-powered disassembly, pack repair and remanufacture, intelligent sorting, safe storage and transport, and digital battery passport integration.
The project developed neural-network-based SoH characterisation applicable across different State-of-Charge conditions, alongside efficient module-to-grid discharge solutions. Automated pack-to-module-to-cell dismantling was validated using machine-learning-driven robotic systems supported by digital twins, demonstrating autonomous connector detachment and advanced object recognition. For second-life applications, RECIRCULATE introduced a low-cost, non-invasive balancing board for LFP-based energy storage systems, designed to detect weak or ageing cells using voltage and temperature data, with a targeted 20% lifetime extension through SoH-based balancing.
In parallel, the project implemented machine-learning-based battery classification and CAN-based SoX characterisation to enable faster and more accurate sorting by condition and provenance, including electrode materials. Smart logistics solutions such as the IoT-

enabled LibaBox provide real-time monitoring during transport, complemented by ADR-focused safety guidelines. Finally, a blockchain-backed marketplace prototype compliant with the EU Battery Regulation (2023/1542) was launched to support trusted trading and full lifecycle traceability.
RECIRCULATE contributes to Batt4EU objectives on digitalisation, safety and circular value chains by integrating AI diagnostics, robotic automation and secure data exchange to facilitate scalable second-life and recycling markets.

Summary and Conclusions

Across the four presentations, several common themes emerged. Firstly, the economic viability of second and third life applications depends on sufficient volumes, reliable diagnostics and clear regulatory frameworks governing safety, liability and data access. Secondly, automation and AI-powered processes for State-of-X diagnostics, sorting and dismantling are becoming indispensable to manage growing volumes while maintaining safety and cost-efficiency. Thirdly, the diversity of battery chemistries and pack designs remains a structural challenge, reinforcing the need for stronger incentives on design-for-disassembly to OEMs.

The session demonstrated tangible progress towards the circularity and digitalisation objectives of the Batt4EU Partnership, particularly in improving reuse rates, enhancing safety and enabling data-driven lifecycle management. It also highlighted the strategic importance of reverse logistics for the European industry, as efficient circular systems reduce raw material dependency, lower environmental impacts and support European industrial competitiveness by reducing costs and dependencies. Future research and innovation efforts should further focus on harmonised State-of-X standards, scalable automation solutions, and regulatory alignment to unlock cross-border reverse logistics at industrial scale. Overall, the session provided valuable insights into how coordinated technological and systemic innovation can transform reverse logistics from a bottleneck into a key enabler of Europe's sustainable battery ecosystem.

Parallel session 5:
Socio-economic engagement of users and citizens in CCAM and knowledge sharing

SUMMARY BY INGRID SKOGSMO (VTI)

Introduction

Session 5 took place on the first day of the conference and addressed two aspects of CCAM: socio-economic engagement of users and citizens, and knowledge sharing. The projects aligned with the goals of the CCAM Partnership, in particular those about understanding user needs and societal effects and to capitalise knowledge to accelerate development and deployment of CCAM solutions.

Projects

SINFONICA (*Social Innovation to Foster Inclusive Cooperative, Connect and Automated Mobility*) was presented by Guilia Renzi, University of Modena and Reggio Emilia. The project, completed in August 2025, established a strong, evidence-based knowledge base on CCAM user needs, with focus on inclusiveness and vulnerable groups. Participatory and co-creation methodologies were developed and implemented, engaging over 1,000 participants directly and some 5,000 respondents through surveys, ensuring user-centred input throughout the CCAM lifecycle. The project created practical tools, KPIs and evaluation frameworks to support CCAM planning, simulation, monitoring and decision-making, guidelines and recommendations to support CCAM Partnership's large-scale demonstrations and local, regional, national authorities in integrating CCAM into transport planning and advancing regulatory and governance frameworks.

CulturalRoad (*Cocreate, Embrace*) was presented by John Paddington, ERTICO. The project runs from May 2024 – April 2027. Cultural, geographical and exogenous diversity is looked into. The 18 partners have so far developed a five-pointed rating system made up of five "pillars": Inclusivity, Network Optimization, Safety, Acceptance and Psychological factors. Each pillar was described in terms of their aims, influencing factors, methodology and

KPIs. Next, the project has the ambition to work with authorities (local, regional, national) aiming at integrating the guidance into SUMPs, NUMPs and large-scale demonstrations, and to investigate wider transferability into non-European countries.

Anna Anund, VTI, presented **Diversify-CCAM** (*Diversify CCAM by integrating the European cultural and regional variations in the design and implementation of citizen-friendly systems to foster mobility equity*), and its achievements during the first 18 months. The three-year project started in June 2024 and aims to diverse CCAM by integrating the European cultural and regional variations in the design and implementation of citizen-friendly systems to foster mobility equity. So far, the project has developed a taxonomy of and indexes for cultural, geographical and policy aspects. Furthermore, a diversification model and target user segmentation have been established, as well as a methodological framework for data collection, evaluation and impact. An intersectional analysis on unveiling the multifaceted factors influencing the adoption of CCAM has also been undertaken.

FAME (*Framework for coordination of Automated Mobility in Europe*) completed in June 2025, was presented by Stéphane Dreher, ERTICO. FAME aimed to support collaboration within CCAM community stakeholders needed for large-scale demonstration and scale-ups of complete CCAM solutions. Stakeholders have been mapped and engaged through a range of activities. Several enabling tools were developed: CCAM Knowledge Base provides a "one-stop shop" for CCAM related activities in EU and beyond. There is also an EU Framework for Testing on Public Roads, including recommendations for harmonised among the EU Member States testing conditions and ethics procedures. The EU Common Evaluation Methodology (EU-CEM) was co-created with CCAM projects and experts; its first version was published in May 2025. These tools are now available for use and welcome feedback (to be provided to the CCAMbassador project).

Conclusion

Following the presentations the audience was invited to a discussion. Items highlighted included how to present CCAM to citizens involved in surveys (use e.g. narratives, pictures, animations; apply a clear vocabulary), and if societal readiness was taken into account (societal readiness is not only about individuals - citizens, but also for planners to understand what lies behind tools, how to select a good service etc). Trust was also pointed out as important: in technology, in other persons, e.g. co-riders, and in decision makers being trusted to take the right decisions. Affordability of CCAM services was highlighted as one of the aspects still needing further investigation.
Among key learnings for future large-scale demonstrations, items mentioned by the presenters include a strong communication strategy (including also schools, sport clubs and elderly centres), the importance of skills, competence and preparedness of authorities, operators, and others which should ensure that the demonstration

complements the existing transport system and afterwards has the potential to scale. A community of local authorities / a cluster of cities with operational CCAM experience could be established for best practice sharing. Finally, it is truly large-scale of efforts that are needed to see and assess impact – and a comparative framework will accelerate learnings.

Parallel session 6:
Power electronics for electric vehicles

SUMMARY BY TOBIAS LANGE (EATON)

Introduction

In the session of **Power electronics for electric vehicles** at the RTR Conference 2026, the projects presented align with the 2022 calls of the European Union's Horizon Europe research and innovation programme, which focus on advancing vehicle electrification for FEV and PHEV architectures. Current EV power electronics rely on a wide variety of semiconductor devices, circuit topologies and auxiliary systems, each optimised for specific power and operating conditions. In this context, the projects outlined—SCAPE, HighScape, HiPE, RHODaS and POWERDRIVE—collectively address the core challenges of standardisation, modularity, performance enhancement, cost efficiency and increase of market acceptance in next generation power electronics for electric mobility.

Projects

The **SCAPE project** (*Switching-Cell-Array-Based Power Electronics Conversion For Future Electric Vehicles*) proposes a standardisable and modular architecture based on multilevel technology, combined with highly compact building blocks and intelligent control strategies.
The switching cell is intended to cover wide current and voltage ranges by scaling switching levels or paralleling approach. Experimental results from high voltage switching cell prototypes show major reductions in thermal resistance and stray inductance. Integration into motors and batteries allows shared cooling systems and compact designs, with potential space savings of up to 10 litres for a 100 kW drivetrain. Cost analyses indicate up to 60% reduction in €/kW through scale economies and standardized modules across multiple EV types. Overall, SCAPE is expected to improve EV range by up to 18%, reduce CO_2 emissions by 30 kton/year, and strengthen Europe's industrial leadership in electrified transport.

The **HighScape project** (*High efficiency, high power density, cost effective, scalable and modular power electronics and control solutions for electric vehicles*) focuses on BEV architectures with distributed or in wheel drives. It develops a family of highly efficient, in-wheel integrated motor with SiC inverter and brake by wire system to take advantage of the applied dual motor system, supported by an improved thermal management system that reuses heat.
Advanced control strategies improve the vehicle dynamics and energy efficiency through fast motor actuation, brake torque blending, and pulse and glide operation, which is demonstrated in validation vehicle prototypes.
Overall, the project achieves >40% loss reduction, increased reliability via reconfigurable architectures and predictive maintenance.

The **HiPE project** (*High performance power electronics integrations*) develops next generation wide bandgap power electronics for 400 V, 800 V and 1200 V systems. Multiple modular WBG-based inverters and converters (50–250 kW), GaN-based onboard chargers, and compact fault tolerant power electronics for ancillaries were designed and validated. Beside the power electronics, a 2-speed transmission was tested. HiPE additionally integrates advanced firmware features such as predictive control, state of health monitoring, and digital twin based reliability management.

The **RHODaS project** (*Reinventing Highperformance pOwer converters for heavy-Duty electric trAnSport*) develops disruptive converter topologies using SiC and GAN semiconductors and digital technologies as cloud-based architecture with digital twins and virtual sensing features for heavy duty drivetrains. The 3-level inverter is benchmarked against common 2-level inverter topology with lower DC-link voltage and outperformed its efficiency in validation test. The losses were significantly reduced; power density increased to 97.7 kW/l and weight was reduced by 30 %. RHODaS platform enables circular-economy based supply chains applicable also to light duty mobility sectors.

Finally, **POWERDRIVE** (*Power electronics optimisation for next generation electric vehicle components*) develops ultra-compact and highly efficient SiC/GaN power electronics to significantly reduce cost, losses, size and weight in passenger EV powertrains. The project delivers optimised traction inverters and on-board chargers, considering component level of connectors, magnetics, and cooling systems, supported by fast simulation models and a driving cycle built from 3,000+ real EV trips. Prototype integrated inverter-motor systems and an advanced 800 V OBC demonstrate major gains in power density and efficiency, even surpassing the funding call targets set.

Conclusion

The **Q&A session** highlighted synergies between the projects, particularly in areas like integration and the combined use of GaN and SiC technologies. Homologation was not considered because the work remains at the research stage, and moving towards production will require follow-up projects with full in-vehicle demonstrations. Participants discussed integration versus recycling, noting that recycling currently has limited business value in the automotive sector, while PCB-based solutions are already easier to recycle than module-based ones. It was also emphasised that EV drive-cycle behaviour varies greatly with seasons and driving styles, and demographic factors were not yet included in the current analyses.

Parallel session 7:
Better infrastructure safety on urban and rural roads

SUMMARY BY THIERRY GOGER (FEHRL)

Introduction

The session on **Physical and digital CCAM infrastructure**, addressed the role of road infrastructure in enabling connected, cooperative and automated mobility. The session focused on the integration of physical infrastructure with digital technologies, including sensing, data fusion, artificial intelligence and digital twins, and examined how these elements can support safer and more efficient transport systems. The topics discussed are directly relevant to the objectives of the CCAM Strategic Research and Innovation Agenda (SRIA), in particular those related to infrastructure readiness, safety performance in mixed traffic, and the digitalisation of road assets, and contribute more broadly to the Clean and Digital Transport Transition.

Projects

The **CAMBER project** (*Connected and Adaptive Maintenance for Safer Urban and Secondary Roads*), presented by Olivera Rozi, is a Horizon Europe project with a duration of 36 months, which started in 2023. The project aims to establish digital connections between road infrastructure elements and road asset and safety management systems, with a focus on urban and secondary roads. The presentation highlighted results from several European pilot sites, where new-generation data sources, vehicle-to-infrastructure data and digital twin concepts are being applied to support safety assessments and maintenance planning. The results presented were derived from a combination of real-world data collection, simulation activities and digital twin-based analysis. The expected impacts include improved safety performance, more cost-effective and targeted maintenance strategies, and increased infrastructure readiness for CCAM deployment, contributing to CCAM SRIA objectives and KPIs related to infrastructure support and road

safety. During the discussion, questions focused on the scalability of the proposed solutions and their integration into existing road authority systems.

The **iDriving project** (*Intelligent & Digital Roadway Infrastructure for Vehicles Integrated with Next-Gen Technologies*), was presented by Alexandros Sfyridis and is a Horizon Europe Research and Innovation Action running from July 2024 to June 2027. The project aims to develop and demonstrate an AI-driven traffic monitoring and decision-support ecosystem integrating digital twins to improve road safety, traffic efficiency and infrastructure management. The presentation reported on early results in AI-based traffic violation detection, UAV-supported infrastructure monitoring and digital twin simulations of traffic conditions. These results were obtained through the application of computer vision techniques, UAV data collection, in-vehicle sensing and digital twin modelling. The project is expected to contribute to CCAM SRIA objectives and KPIs related to incident detection, traffic efficiency and infrastructure monitoring, while supporting proactive maintenance and operational decision-making. Points raised during the discussion included validation in real-world pilots, interoperability with existing traffic management systems and performance targets for AI-based solutions.

The **EvoRoads project** (*Evolutionary Solutions for Realising a Holistic Safe System Approach for All Road Users*), presented by María Alonso, is a 36-month Horizon Europe project running from May 2024 to April 2027. The project aims to accelerate progress towards Vision Zero through a holistic, data-driven safe system approach. It focuses on the development of a multi-layered safety criteria catalogue, the integration of heterogeneous data sources, and the deployment of digital twin and V2X-enabled platforms for proactive risk identification and infrastructure assessment. The presentation highlighted achievements in sensing technologies, AI-based hazard detection, digital twin deployment and pilot testing across several European regions. The results were obtained through real-world data collection combined with AI analytics and digital twin-based evaluation. The expected impacts include improved infrastructure safety assessment, enhanced support for vulnerable road users and increased infrastructure readiness for CCAM, in line with CCAM SRIA objectives on safety assurance and deployment support. The discussion addressed issues related to standardisation, alignment with European data spaces and transferability of results to road authorities with different levels of digital maturity.

Conclusion

In conclusion, the session demonstrated the importance of digitally enabled road infrastructure in achieving CCAM objectives related to safety, reliability and scalability. Across the three projects, digital twins, AI-based sensing and integrated data flows were shown to support proactive infrastructure management and improved safety performance in mixed traffic conditions. The session highlighted the need for

interoperability, standardisation and close cooperation with road authorities to ensure effective uptake of results. Future research needs identified include further large-scale validation, strengthened data-sharing frameworks and continued development of cost-effective digital infrastructure solutions to support widespread CCAM deployment across Europe.

Parallel session 8:
Smart enforcement for resilient, sustainable and more efficient transport operations

SUMMARY BY FRANZISKA SCHMIDT (UNIVERSITY GUSTAVE EIFFEL)

Introduction

Session 8, "**Smart enforcement for resilient, sustainable and more efficient transport operations**," concluded the first day of RTR2026. This session's main focus is to present how new technologies and systems are changing the way that transport enforcement is viewed—from a friction point to a facilitator of increased traffic flow, safety, equitable competition and resilience. Three research and innovation projects that deal with the development of a digital representation of the necessary ecosystem between vehicles, infrastructure, authorities and consumers to enable smart enforcement and logistics are presented.

Projects

Beatriz Martinez-Pastor began by introducing the **SETO project** (*Smart Enforcement of Transport Operations*), which brings together road authorities, industry (including small businesses), and academia to establish a platform that collects data from vehicles and their operations. By addressing weigh-in-motion problems and positioning in crucial locations, attention has been paid to the accuracy of this data. Another problem with data sharing has been the pursuit of win-win scenarios that encourage information sharing. In fact, data can enter the platform directly (from trucks or WIM stations) or via an existing platform (like logistics firms). Two living labs, one in Belgium (multimodal) and one in France (highway A63), have been used to conduct and test this research.

Mauro Dell'Amico described **Project KEYSTONE** (*Knowledgeable comprehensive and fully integrated smart solution for resilient, sustainable, and optimised transport operations*). Research organisations, SMEs and industry participants (road and rail logistic companies) are involved in this project. In order to make it easier for small businesses to use, this

project developed an API for data sharing and a web application with a mobile version that runs on smartphones. Data sovereignty (data still belongs to its creators) and data storage (nothing is done) were discussed. The potential of collecting data for eFTI has been described. Applying and evaluating the research findings has been made feasible by two real-world pilots: one in intermodal shipment (rail/road) and the other on road transport and its digital environment.

Lastly, **Project DELPHI** (*feDerated nEtwork of pLatforms for Passengers and freigHt Intermodality*), which aims to address the lack of coordination between passenger and freight transport, was presented by Giannis Kanellopoulos. The project applies cutting-edge technology such as AI/ML powered algorithms to streamline traffic management and enable seamless data sharing across sectors. For example, the project DELPHI has shown that there is a viable business rationale for taking advantage of the non-utilised capacity of the existing public transit infrastructure at night for freight transport. In order to test this federated data collection, four pilots have been developed, each with unique ecosystems and requirements. Last-mile transportation has for example been a use case.

Conclusion

Although none of the developed platforms are available on the market at this time, they are regarded as building blocks for larger structures: the necessary connectors and dataspaces are made. They are also accessible to the general public. As demonstrated by the concerns posed during the Q&A portion of the session, there are still unanswered questions regarding the necessity of persuading public authorities (police, enforcement) and those who are immediately impacted (transport operators and drivers) but these projects help to achieve the objective to make the logistics sector more attractive, fair, resilient, sustainable and efficient.

Parallel session 9:
User centric energy optimised EV

SmartCorners | MINDED | EFFEREST

SUMMARY BY IAN FAYE (BOSCH)

Introduction

The session focused on advances in **user centric EV design and energy optimisation**, bringing together three projects funded under the 2023 call on improving electric vehicle efficiency through predictive control, artificial intelligence and thermal-energy management. The session was opened by highlighting the need to increase energy efficiency across all EV components and to understand how user centric design can help here, but also improve affordability, comfort and safety. Each project taking a different approach ranging from vehicle design and segment to detailed analysis of actual driving behaviour over exemplary time periods to improve requirement specifications. Although the projects are still early in the development cycle, each team presented initial results and expected impacts.

Projects

The first presentation introduced **SmartCorners** (*User-centred Optimal Design of Electric Vehicle with Smart E-Corners*) led by AVL. The project aims to improve comfort, safety and efficiency while reducing development time and cost. The project is developing a skateboard style chassis equipped with modular "smart corners" that integrate in wheel motors, steer by wire systems, active suspension, brake by wire and camber/toe actuators. While in wheel motors increase unsprung mass, the team uses advanced control strategies to maintain safety and handling in spite of the disadvantage. A major focus of Smart Corners is intelligent control supported by AI and model based software. The system can anticipate conditions—such as slippery roads—and automatically adjust braking, suspension and steering. Digital twins allow simulation models from multiple partners to be combined into a distributed testing environment. The project is now transitioning from simulation to hardware demonstrators. A major focus is intelligent

control supported by AI and digital twins, enabling predictive responses to road conditions and coordinated thermal comfort management using HVAC, seat heating, steering wheel heating and infrared panels.

The second presentation, from the **MINDED project** (*Thermal and energy Management for INcreased Driving range of an Electric minibus including improved user-centric Design and thermal comfort*), focused on electric minibuses for public transport. Coordinated by the Austrian Institute of Technology, the project aims to increase real world driving range by 20% at 0°C, where heating loads significantly reduce efficiency. Baseline measurements showed that the minibus achieved about 220 km of range at 23°C, but this dropped by roughly one third at 0°C and even more at −7°C, largely due to heating demands with the heating system consuming about 23% of energy used. To address this, the team developed an innovative heat pump system using an oil free compressor to replace the vehicle's PTC heaters, reducing heating energy consumption by up to 50%. They also introduced infrared heating panels at every seat, both on the backrests and floor, allowing the cabin temperature to be lowered without sacrificing comfort. Additional work includes optimised battery and powertrain thermal management strategies with a nonlinear model predictive control architecture and AI based driver behaviour prediction. The project is on track to achieve its range target and demonstrates strong potential for improving comfort and reducing energy consumption in public transport.

The final presentation introduced **EFFEREST** (*EFFicient user-centric EneRgy managEment SysTems for optimized EVs*), coordinated by Virtual Vehicle. The project focuses on user centric optimisation of EV energy management, integrating thermal and powertrain control into a unified architecture. This is done by developing a multilayer control architecture that combines long term planning with mid-term optimisation and short-term actuation. The system uses physics informed machine learning models to predict cabin and occupant comfort, allowing the vehicle to adapt heating strategies to individual preferences. The project also integrates heating panels, natural refrigerants and hardware in the loop testing.
A central theme for EFFEREST is right sizing, which the team described as designing vehicles based on real user behaviour, not assumptions. By analysing user centric driving data, climate conditions, and comfort expectations, the project aims to determine the optimal balance between battery capacity, thermal system performance and cost. This approach avoids oversizing components—such as unnecessarily large batteries—and instead tailors the vehicle to actual usage patterns. According to the team, right sizing is essential for keeping European EVs competitive, especially in the cost sensitive B segment. The project uses digital twins and physics informed machine learning models to predict comfort needs and optimise heating strategies, showing promising early insights into how user centric data can guide next generation EV design. The team stressed that such data driven design could help Europe remain competitive in the B segment EV market.

Conclusion

The session concluded with a **Q&A discussion** on software integration, thermal system complexity, user data needs and the balance between comfort and efficiency. The session was closed by thanking the speakers and audience and highlighting the importance of these projects for Europe's transition to zero emission mobility.

Parallel session 10:
Air quality and impact of emission on human health

SUMMARY BY ZISSIS SAMARAS (ARISTOTLE UNIVERSITY OF THESSALONIKI & EMISIA)

Introduction

The session "**Air Quality and Impact of Emissions on Human Health**" took place on 11th February 2026. The session addressed two topics of the Horizon Europe Work Programme: (a) Understanding and mitigating the effects on public health of emerging non-regulated nanoparticle emissions issues and noise (2020); (b) Prevent smog episodes in Europe: Air quality impact of engine-emitted volatile, semi-volatile and secondary particles (2022).

Both topics contribute to the development of **cost-effective policies to reduce transport-related air pollution**, considering the system in a holistic manner. In particular, they address **ultrafine particles, non-exhaust emissions and the formation of secondary pollutants in the atmosphere**, which remain insufficiently understood and are only partly covered by existing regulatory frameworks. The session included presentations from three projects: ULTRHAS, AEROSOLS and PAREMPI.

Projects

The **ULTRHAS project** (*Ultrafine Particles from Transportation: Health Assessment of Sources*) investigates the health impacts of ultrafine particles emitted from different transport sources. The project examines how **transport modes, fuel technologies and wear processes**, as well as **atmospheric ageing**, influence the physical and chemical properties of emitted particles and gases. Using advanced emission measurement techniques, exposure studies and toxicological testing under controlled laboratory conditions, ULTRHAS aims to understand the **biological responses induced by these emissions**, including effects on the lungs and other organs. The project will rank the relative health hazards of emissions from different transport sources and apply **health**

impact assessment methodologies, including burden-of-disease approaches, to evaluate policy scenarios and support the prioritisation of mitigation strategies.

AEROSOLS (*Air Quality and Health Impact of Primary Semi-Volatile and Secondary Particles and their Abatement*) addresses the challenge of **volatile and semi-volatile emissions from vehicles and their role in secondary aerosol formation**. These emissions are often poorly characterised and can contribute significantly to ambient particulate matter. The project develops improved measurement and modelling methods to quantify these emissions under **real driving conditions** and investigates how they evolve in the atmosphere to form secondary particles. By linking emission characterisation with atmospheric modelling and health impact analysis, the project aims to identify the most relevant emission sources and propose **technological and regulatory solutions** to mitigate their effects on air quality and human health.

The **PAREMPI project** (*Particle Emission Prevention and Impact: From Real-World Emissions of Traffic to Secondary PM of Urban Air)* focuses on the **contribution of transport-related emissions to secondary particulate matter formation in urban environments**. Through a combination of measurements, modelling and analysis of existing data, PAREMPI seeks to improve the understanding of the **precursors emitted by transport sources and the atmospheric reactions that lead to secondary $PM_{2.5}$ formation**. A key element of the project is the development of a modelling tool (the **ePMI module**) to better quantify these processes and assess their impact on air quality. The project will combine scientific findings with **health impact assessment** in order to provide policy-relevant recommendations for reducing the contribution of transport emissions to smog episodes in Europe.

Discussion

The discussion following the presentations highlighted several important issues for future research and policy development.

A first topic concerned the **use of toxicological evidence in supporting regulatory action**. While toxicology provides valuable insights into the health effects of specific particle types and chemical species, participants noted the **large variability between experimental methods and results**, which currently limits the direct translation of toxicological findings into regulatory metrics. Strengthening links between emission measurements, toxicological studies and epidemiological evidence was, therefore, identified as an important research need. Participants also discussed **emerging challenges related to new vehicle technologies and fuels**. These include the environmental performance of plug-in hybrid vehicles under real-world operating conditions, the consequences of frequent engine starts, and the potential impacts of **alternative fuels, such as hydrogen or other low-carbon fuels,** used in road and

maritime transport. Another key theme was the **need for improved understanding of secondary pollutant formatio**n, including the role of volatile and semi-volatile emissions in generating secondary aerosols. Better integration between **emission measurements, atmospheric modelling and air-quality observations** was highlighted as essential for improving emission inventories and predicting air-quality impacts.

Finally, the discussion emphasised the growing importance of **non-exhaust emissions,** particularly those arising from **tyre and road wear**. Participants stressed the need for improved knowledge of particle generation mechanisms, the influence of tyre composition and road surface properties, and the effects of driving conditions and environmental factors. Developing **robust emission factors and harmonised measurement approaches** was identified as a key prerequisite for addressing these emissions in future policy frameworks.

Parallel session 11:
Testing and validation of safe CCAM systems

SUMMARY BY BASTIAAN KROSSE (TNO)

Introduction

This session covered **testing and validating Connected, Cooperative and Automated Mobility (CCAM) systems**, which is key to Europe's Clean and Digital Transport Transition. Over a hundred participants attended onsite, together with an online audience. The European Commission highlighted the urgent need for safe, automated mobility to boost competitiveness and public trust. The **CCAM Partnership** aims for scenario-based validation, harmonised safety methods and large-scale data sharing. Projects such as SUNRISE, SYNERGIES and I4Driving support efficient validation through coordinated simulation frameworks and unified safety assurance.

The session emphasised that **robust safety assurance processes are essential for reliable automated mobility**. Achieving this requires new approaches beyond traditional testing, integrating real-world data, simulations and behavioural modelling. The featured projects demonstrated Europe's progress towards these goals in a collaborative manner.

Projects

The **SUNRISE project** (*Safety assurance fRamework for connected, automated mobIlity SystEms*, started in 2022, completed in August 2025) was presented by Nuria Pereira (on behalf of project coordinator Stefan de Vries). The objective of the project was to develop a harmonised safety assurance framework for CCAM systems that supports stakeholders in testing, validating and deploying automated mobility technologies safely. The project produced a comprehensive Safety Assurance Framework methodology, structured around three pillars—methods, tools and metrics—designed to guide vehicle developers, certifiers, researchers and tool providers in consistent safety evaluation practices. The

framework incorporates insights from international regulations, standards and extensive stakeholder workshops. SUNRISE also delivered a publicly available online handbook including a scenario hub, safety argumentation methods and guidance for both virtual and physical validation activities. The methodology was validated through real-world use cases, involving various vehicle types and testing environments. Methods used included a combination of virtual simulation, physical testing, scenario generation, stakeholder co-creation and alignment with regulatory and standardisation bodies. The SUNRISE framework is expected to become a reference methodology, supporting Europe's transition to safe large-scale deployment of CCAM technologies. As such, SUNRISE directly supports the CCAM SRIA goals of harmonised safety assurance, scenario-based validation, regulatory alignment and overall strengthening of Europe's CCAM innovation ecosystem. Questions focused on synthetic versus real data, ensuring realistic simulation, and the future integration of the SUNRISE methodology into successor projects such as CERTAIN, which will expand the framework to AI-enabled systems.

The **SYNERGIES project** (*Real and synthetic scenarios generated for the development, training, virtual testing and validation of CCAM systems*, started June 2024, ending May 2027) was presented by Jordi Point. The objective of the project is to fully enable the SUNRISE Safety Assurance Framework by creating a unified European scenario data space that supports scenario generation, data sharing and testing scalability. SYNERGIES has already established the first version of its European Scenario Data Space, integrating multiple real-world datasets, synthetic data generation tools and a scenario marketplace. The project identified more than 160 datasets and filtered them using a high-level qualification methodology; this resulted in approximately 70 high quality datasets suitable for scenario extraction. The project also developed an intermediate data format to harmonise trajectory and scenario data, and has published more than 100 scenarios accompanied by nine scenario-processing tools. The first public platform release took place in November 2025, with additional releases planned. Methods used included: Scenario extraction, data federation, synthetic data generation, simulation-based validation and collaborative workshops with stakeholders, OEMs and international partners. SYNERGIES will substantially reduce the cost and time required for CCAM safety validation by shifting from kilometre-based validation to scenario-based safety evidence. As such, the project directly supports CCAM KPIs on scenario data availability, interoperability, standardisation and efficient validation pathways, enabling Europe to move toward a scalable and trustworthy CCAM validation ecosystem. Discussions centred on interoperability, scenario realism, synthetic data validity and how new scenarios from real-world incidents can be integrated. The challenges of covering infinite scenario combinations and ensuring ODD-specific safety evidence were also raised.

The **I4Driving project** (*Integrated 4D driver modelling under uncertainty* - three-year project extended by six months, ending March 2026) was presented by Vincenzo Punzo. The objective of the project is to develop and validate heterogeneous, credible human driving behaviour models to serve as a benchmark for virtual safety assessment of automated driving systems. The project created interpretable driving behaviour models capturing cognitive workload, attention distribution, reaction time variability and behavioural adaptation. Large-scale driving simulator experiments, augmented-reality field tests and test-track experiments were used to calibrate and corroborate the models. Validation included more than 800 model variants and enormous amounts of simulation runs to evaluate sensitivity and robustness. The models were embedded into various simulation environments, supporting context-aware, closed-loop simulations that uncover human-like interactions with automated systems. Key findings demonstrated that current regulatory models underestimate certain human capabilities, and that incorporating behavioural diversity can significantly broaden scenario coverage. Methods used included: Driving simulators, virtual/augmented reality, test-track experiments, Monte Carlo analysis and behavioural modelling across multiple simulation platforms. The models will enable more realistic and reliable virtual safety assessments by representing the diversity of human driving behaviour in automated vehicle simulations. The project strengthens CCAM ambitions on human-centred validation, closed-loop simulation capabilities and evidence-based behavioural modelling, supporting future regulatory acceptance of simulation in type approval. Questions touched on the comparison of human factor based models with rule based or AI based ADS behaviour, handling of extreme or rare behavioural cases, and the potential integration of I4Driving scenarios into SYNERGIES' scenario data space.

Session Summary

The session clearly demonstrated that Europe is making coordinated progress towards robust, scalable and efficient safety assurance for CCAM systems, fully aligned with the CCAM Partnership's objectives and KPIs on safety validation, scenario availability, regulatory alignment and cross-border knowledge transfer. From a qualitative perspective, the session proved highly valuable: the three projects collectively illustrated a continuum—from methodology (SUNRISE) to scenario infrastructure (SYNERGIES) to behavioural realism (I4Driving)—showing how each contributes uniquely to Europe's long-term safety vision. The active audience engagement reaffirmed the sector's need for trustworthy testing methods, interoperable scenario formats, complementary real and synthetic data, and transparent simulation models.

A key lesson is that safe deployment of automated mobility will require **continuous iteration**, including the integration of newly observed **real-world scenarios, updated AI behaviour validation and cross project knowledge exchange**. Future research will need to expand into **AI-enabled functions, in service monitoring data, user centred**

safety metrics and pan European scenario harmonisation, ensuring that CCAM systems remain safe throughout their lifecycle and across diverse operating conditions.

Parallel session 12:
Next generation battery systems for road transport and mobility applications

SUMMARY BY BOZORG KHANBAEI (BPA)

Introduction

The session, entitled "**Next Generation Battery Systems for Road Transport and Mobility Applications**", focused on innovations at the battery system and pack level to meet the growing performance, safety and sustainability requirements of electrified mobility. The presentations highlighted advances in battery pack architecture, materials and system integration aimed at improving energy density, reducing weight and enhancing safety while supporting circular design approaches. These developments align with the objectives of the Batt4EU Partnership, which aims to strengthen Europe's battery value chain and support the development of competitive and sustainable battery technologies. The projects presented demonstrated how system-level innovations—including modular pack designs, advanced sensing technologies and improved materials—can contribute to safer, lighter and more efficient battery systems for road transport and other mobility applications.

Projects

The **VERSAPRINT project** (*NexT gEneration MultiPle architecture battery Systems for indusTry*) focuses on developing versatile battery pack solutions using 3D printing technologies to enhance system performance, safety and sustainability. The project introduces modular "building blocks" that can be integrated into battery packs to improve functions such as sensing, electrical interconnection, and structural design.
A key development presented was the integration of printed sensors and structural components directly into battery pack designs, enabling improved monitoring of voltage, current and temperature. Prototype modules demonstrated an energy density of approximately 140 W.h/kg and 235 W.h/l, with testing conducted under automotive-relevant conditions, including charge–discharge cycles and vibration testing.

The project also assessed the environmental performance of the pack architecture through lifecycle assessment. While some manufacturing impacts were higher than conventional designs, potential battery lifetime extensions of 10–25% could offset these impacts over the full lifecycle. Therefore, the project supports improved modularity, easier disassembly and greater circularity in battery pack design.

The **EXTENDED project** (*nEXT gEneration of multifuNctional, moDular and scalablE soliD state batteries system*) presented by Bruno Rodrigues from AVESTA, focuses on developing semi-solid-state battery systems with modular architectures and multifunctional components. The project aims to improve battery performance and safety while enabling applications across sectors including electric vehicles, heavy-duty transport, aviation and stationary storage.
The project targets improvements, such as 20–50% component weight reduction, improved thermal safety and fast-charging capability of up to 350 kW. A modular battery architecture using fire-retardant polymer enclosures and pressure control systems for semi-solid-state cells was demonstrated, achieving an energy density of 173 W.h/kg.
Further developments include advanced battery management systems, integrating wireless communication and printed sensors for monitoring temperature, humidity and cell impedance. These solutions reduce wiring complexity by around 30% while improving system diagnostics. Thermal modelling and testing also showed stable temperature distribution within battery modules, supporting safe operation.

The **TEMPEST project** (*Versatile printed solutions for a safe and high performance battery system*) presented by Jeremy Warren from Applus+ RESCOLL, focuses on developing innovative battery pack architectures and materials to improve performance, safety, and recyclability. One of the key developments is a structural health monitoring system integrated into composite battery housings. The system uses ultrasonic imaging techniques to detect structural damage within the pack, allowing early identification of potential safety issues. The monitoring system includes multi-channel data acquisition and embedded signal processing algorithms.
The project also developed improved battery housing solutions using composite materials with enhanced fire resistance and impact protection. Additional work addressed battery circularity through reversible adhesive systems that enable easier pack disassembly and recycling, as well as hydrogen-based processes for recycling graphite electrodes and recovering valuable materials from battery waste.

Session Conclusions

The session highlighted the importance of system-level innovation in advancing next-generation battery technologies for mobility applications. A common theme across the projects was the integration of performance improvements with circular design approaches, including modular architectures, improved recyclability, and lifecycle

optimisation. Further research will be required to support industrial scaling and integration of these innovations into commercial battery systems, ensuring compatibility with future regulatory and sustainability frameworks.

Parallel session 13:
Advanced transport emissions monitoring networks

Erika von Schneidemesser	Manos Manousakas

SUMMARY BY ADRIAN VELAERS (CONCAWE)

INTRODUCTION

This session took place on Day 2, 11th February 2006, focussing on two separate areas defined by the EC in their Horizon Europe work programme.

PROJECTS

The presentation of **Net4Cities** (*Real-Time Monitoring Networks and Transport Emissions for Tailored Zero Pollution Action Plans in European Cities)* was given by Erika von Schneidemesser. The project, funded under the EU's Horizon Europe programme, aims to advance real-time air and noise pollution monitoring networks in eleven European cities (including transport hubs such as ports and airports) to support tailored zero-pollution action plans, with a focus on transport-related emissions and the EU's 2050 zero-pollution vision.
As of early 2026, the project has made significant progress since its 2024 launch: monitoring infrastructure deployment is well underway across more than thirty sites, with new instruments installed for ultrafine particles, black carbon, ammonia, noise and traffic data collection. Work continues on the Net4Cities Studio, a web-based platform for real-time maps and policy support tools, alongside efforts to synthesise findings for evidence-based reduction strategies. The project is in the phase of data collection and emissions monitoring, with no key findings or conclusions yet.

The presentation of the **MI-TRAP project** (*MItigating TRansport-related Air Pollution in Europe*) was given by K. Eleftheriadis. The project, funded under the EU's Horizon Europe programme, runs from 2024 to 2027 involving 26 partners from 11 countries. It focuses on bridging gaps between transport emission standards and real-world ambient air

quality by addressing uncertainties in non-exhaust emissions, microplastics, ultrafine particles (UFP) and black carbon (BC), while deploying innovative monitoring networks near hotspots in ten European cities, integrating nature-based solutions (NBS), citizen science and real-time data tools to support the EU Zero Pollution Action Plan.
As of early 2026, the project has reached its midpoint. Work continues on real-time monitoring protocols, policy recommendations and ready-to-use tools for dynamic traffic and port management. The project impact by 2030 was projected as, in summary as: (a) UFP and BC monitoring moves from research to operational use (cities and authorities have validated, standardized methods ready for deployment, supporting new Directive requirements and advanced monitoring/supersites); (b) Urban air quality management becomes hotspot-focused (transport emission hotspots (roads, ports, airports) can be identified, characterized and prioritized using near-real-time data.); (c) Health relevance is strengthened beyond limit values (exposure-based indicators (UFP, BC) are linked to dosimetry and epidemiology complement compliance metrics); and, (d) Non-exhaust emissions are explicitly addressed (the measurement and source-apportionment basis needed to manage the emissions are provided).

There were some questions for clarity but no debate on the progress or findings at this stage. Both projects will collect large amounts of emissions which will be very interesting once processed and conclusions drawn.

Parallel session 14:
Passenger experience, inclusiveness and safety

SUMMARY BY DIMITRIS MILAKIS (DLR)

Introduction

Session 14, "**Passenger experience, inclusiveness and safety**", took place on 11th February 2026 within the CCAM track of the results from Road Transport Research (RTR) Conference 2026. The session addressed key priorities of the Horizon Europe Work Programme and the CCAM Partnership's Strategic Research and Innovation Agenda (SRIA), in particular Cluster 2 on Vehicle Technologies. The session highlighted the increasing importance of passenger experience, inclusiveness and perceived safety as critical determinants of demand, societal readiness and economic viability in emerging shared and automated mobility services.

Projects

The first presentation introduced the **OptiPEx project** (*Optimising Passenger Experience in Public Transport*), presented by Sari Järvinen (VTT). OptiPEx focuses on integrating passenger comfort, inclusiveness and safety into deployable on-board vehicle technologies for public transport. The project combines privacy-preserving in-vehicle sensing, edge-based artificial intelligence and real-time analytics to assess passenger behaviour, comfort and security, enabling adaptive and inclusive services. Key results presented included multimodal sensing solutions (video, audio and 3D skeleton tracking), AI-based detection of crowding, abnormal situations and passenger needs, as well as the development of certifiable digital components, such as SIL2 safety-assessed rail-grade CCTV systems. OptiPEx contributes primarily to SRIA expected outcomes related to vehicle technologies that assess and optimise the on-board experience, with additional links to advanced human-machine interaction and perception-focused safety.

The second presentation focused on the **AutoTRUST project** (*Autonomous self-adaptive services for transformational personalised inclusiveness and resilience in mobility*), presented by Antonios Lalas (CERTH). AutoTRUST addresses the development of AI-driven, self-adaptive vehicle intelligence that integrates multimodal perception, in-cabin monitoring and safety-aware interaction directly into automated vehicle systems. The project demonstrated advanced capabilities in cooperative perception, driver and passenger state monitoring, motion sickness estimation, behaviour and violence detection, and the use of a multimodal, safety-aware virtual assistant. Results were supported by quantitative performance improvements and extensive validation using co-simulation frameworks and pilot activities. AutoTRUST contributes strongly to SRIA expected outcomes on advanced human–machine and human–technology interaction, reliable on-board decision-making in complex real-world contexts, preventive and protective safety for highly automated vehicles, and software-defined, upgradable vehicle functions.

The discussion session focused on societal readiness as a key enabler for the deployment of passenger-centric CCAM technologies. In response to the moderator's question on which societal actors are most influential for successful deployment, both projects converged on the view that societal readiness is multi-actor and co-dependent, rather than driven by a single stakeholder group. Operators were identified as critical actors in public and shared mobility contexts, while passenger trust, regulatory acceptance and manufacturer readiness were recognised as equally important. Issues related to data protection and regulatory compliance were also discussed, with both projects highlighting the use of privacy-preserving, on-board and edge-based processing as a key design choice to minimise personal data exposure and facilitate compliance with GDPR and emerging AI regulation. Moreover, the discussion addressed limitations and potential biases of AI-based monitoring functions, particularly in relation to emotion recognition, fatigue detection and cross-cultural interpretation of behavioural signals, underlining the need for careful validation and transparency. These exchanges pointed to remaining challenges in scaling such solutions beyond pilots, as well as to the importance of governance frameworks that clarify responsibilities and acceptance criteria among operators, manufacturers and authorities in order to support market uptake.

Conclusion

In conclusion, Session 14 demonstrated that passenger experience, inclusiveness and safety should not be peripheral considerations but core design parameters for future automated and shared mobility systems. The complementary approaches of OptiPEx and AutoTRUST showed how user-centric on-board technologies and advanced vehicle intelligence can jointly contribute to CCAM deployment, while also revealing common challenges related to investment readiness and actor alignment. Future research should further address the integration of these technologies into scalable, certifiable and

economically viable solutions, while strengthening evidence on societal readiness across diverse mobility contexts.

Parallel session 15:
Innovative battery management systems for next generation vehicles

SUMMARY BY IOSU CENDOYA (CIDETEC)

Introduction

This session introduced the main topic addressed by the two projects described here, a topic that was jointly promoted by the 2Zero and Batt4EU partnerships, focused on the development of a cost-effective, cloud-connected Battery Management System (BMS) with predictive diagnostics and open interfaces that improves battery performance, enables smart charging services, and reduces development time through advanced simulation and better vehicle communication.

Projects

Sajib Chakraborty (VUB), representative of **InnoBMS** (*Situationally aware innovative battery management system for next generation vehicles*), presented an overview of the project. He demonstrated how computationally efficient electrochemical models can operate in situ, within hardware, as virtual sensors, enabling more accurate monitoring of battery behaviour in real time. The presentation also showcased embedded software designed to integrate seamlessly with BMS hardware, ensuring reliable and efficient system performance. In addition, a scalable wireless BMS architecture was introduced, capable of adapting to increasing battery energy content and supporting future electrified vehicle platforms. Finally, a heterogeneous validation testbench was presented, enabling safe, comprehensive and flexible testing of advanced BMS functionalities before deployment. Regarding the impact, the project strengthens European battery innovation by supporting 2Zero and Batt4EU, collaborating with related EU projects and engaging stakeholders to maximise impact and post-project exploitation. It also advances next-generation BMS and battery systems by improving efficiency, lifetime and second-life suitability, while helping make EVs cheaper, longer-range and faster-charging, including in low-temperature conditions.

Marco André Duarte (INOVA+) represented **iBattMan project** (*Smart, Connected and Secure Battery Management System Enhanced by Next Generation Edge and Cloud Computing, Sensors and Interoperable Architecture*) and introduced it as an advanced BMS project that combines real-world use cases, driving-data-based modelling and validation on three battery packs, to improve safety and performance. Sustainability is supported by enabling second-life applications, recycling and renewable energy integration in line with the EU battery roadmap. At the same time, it aims to extend battery lifetime and range, improve diagnostics and vehicle control, and reduce battery costs through fewer components, less wiring and enhanced connectivity. This project's impact focuses on supporting the EU battery roadmap by accelerating the uptake of smart, sustainable Li-ion batteries and promoting circular business models, renewable integration and second-life applications. At the same time, it strengthens the shift to electric mobility by improving battery lifetime, range, monitoring, connectivity and overall cost-effectiveness, leading to more efficient and affordable EV battery systems.

Conclusion

During **the Q&A session**, synergies between different projects, clusters and partnerships were highlighted, such as the follow-up between NextBMS and InnoBMS, the contribution to COLLABAT cluster and the close communication with the 2Zero and Batt4EU partnerships. The scenario of the battery second life and how to enable it through the share of data and design of components for the whole extended life of the battery was discussed. The BMS resulted in a powerful means to improve the battery volumetric energy density through wireless approaches, replacement of sensors with enhance SoX functionalities and preconditioning techniques. The proposed BMS architecture is valid for any chemistry, after the characterisation of the selected cell chemistry. Business cases after the project are feasible since key partners of the European battery value chain are co-developing the new IP proposed in both projects.

As a conclusion, both projects showed that an enhanced BMS can add value to a battery pack by improving its performance and extending its life; on the other hand, it was proved that a well-designed BMS is key to enable the battery circularity. As a strength, both projects developed fully European IP, backed by European OEMs and suppliers willing to adopt this advancement in their products. Weaknesses related to made-in-Europe semiconductors still might need support from the EC, in order to assure technological sovereignty; access to battery data, in order to bridge the gap between battery first and second life, is also an unregulated aspect that would be solved by the battery passport implementation.

Parallel session 16:
Retrofit solutions, brake and noise emissions reduction

SUMMARY BY MICHAEL WEISSNER (VOLKSWAGEN)

Introduction

Session 16 addressed understanding and mitigation of the topic of particle and noise emissions in a wide range, from a low TRL in L-category vehicles (LVs) to higher TRL in passenger cars, LDVs and buses. The results shown from the recently or nearly finished projects from Horizon Europe will contribute to cleaner mobility with reduced health impacts. The projects covered topics from emission sources and health effects to technical solutions, new testing methods and fundamental data as a basis for future regulations and soon available products on the retrofit market.

Projects

The first presentation was given by Athanasios Dimaratos (LAT) about the **project VERA** (*Vehicle Emission Retrofit Activities*). The project started in December 2022 and will finish in May 2026, after a duration of 3½ years. The VERA project develops, optimises and demonstrates innovative tailpipe retrofit solutions for Euro 6 passenger cars, light duty vehicles and Euro VI buses, to address particle and NOx emissions, especially considering NH_3 emissions. The positive effects of reducing tailpipe emissions below EU7 limits by the use of dedicated catalyst coatings and filters have been demonstrated. Also, VERA designs and demonstrates brake retrofit solutions, applicable both as first installation on new vehicles as well as replacement parts. The combination of filtration systems with innovative discs and pads aims at maximum brake emission reduction of road vehicles, while particles from metro applications will be addressed with a filtration system and properly machined pads. The significant reduction, of up to 80% of WLTP brake emissions, has been presented. The results realised so far, including conducted toxicological analysis for exhaust and brake emissions, have been used to create a tool to perform an Cost-Benefit Analysis to assess the impact of technical measures.

In the second presentation, Leonidas Ntziachristos (E:misia) described the results of the **LENS project** (*L-vehicles Emissions and Noise mitigation Solutions*), which started in September 2022 and finished in November 2025. The LENS project applied techniques to monitor LVs' noise and emissions, provided recommendations on how to control the contribution of current and future LVs, examined emissions and noise performance under real driving conditions and deployed methods to identify tampered vehicles. More than 150 LVs have been assessed to characterise their noise and pollutant emissions, including the effect of tampering. The results have been presented (such as 10x higher NOx emissions than passenger cars) and led to a lively discussion, especially regarding the tampering observations. One of the outcomes is that the focus of tampering is usually related to the "sound" of the vehicle and that this is even more relevant for the more expensive vehicles, mainly motorbikes. LENS has created a useful amount of data in the relatively new field of LV-emissions and led to a set of recommendations for both regulators and researchers. One of these recommendations is that noise regulations need to be adjusted and, most importantly, to be reinforced, e.g. by the use of noise cameras.

Conclusion

The session has shown a significant maturity gap concerning noise and pollutant emissions regarding the vehicle classes. The passenger cars and bigger vehicles are well understood and regulated, hence we see high TRL technical retrofit solutions as a result of the projects with a high likelihood, such that these technologies could enter the market soon. The LVs, on the other hand, seem to be less investigated yet contribute significantly to sound and pollutant emissions, especially (but not only) when tampered. Both projects delivered valuable input and clear recommendations: their results will contribute to less noise and better air quality, while the lively discussion demonstrated the high attention and relevance of this topic, now including the LVs.

Parallel session 17:
CCAM services integration into traffic management and fleets

Introduction

Session 17, "**CCAM services integration into traffic management and fleets**," explored how Cooperative, Connected and Automated Mobility (CCAM) technologies can be embedded into existing traffic management systems and fleet operations to improve safety, efficiency and coordination across transport networks. Moderated by Pedro Alfonso Pérez (CINEA) and Serge van Dam (Ministry of Infrastructure and Water Management), the session brought together experts working on CCAM-enabled services that support real-time decision-making and cooperative mobility.

The session addressed a central challenge for CCAM deployment: automated and connected vehicles cannot operate effectively in isolation. Their benefits – safer driving, smoother flows, reduced congestion and more predictable operations – depend on continuous data exchange between vehicles, infrastructure and traffic management centres. The discussion, therefore, focused on how to integrate CCAM services into operational environments, how to ensure interoperability across regions and systems and how to validate performance at scale.

The topic aligns closely with the CCAM Partnership's SRIA ambitions, particularly regarding cooperative systems, traffic efficiency and safe, predictable automated mobility. By embedding CCAM into traffic management and fleet operations, Europe can accelerate the transition towards coordinated, multimodal and digitally supported mobility ecosystems.

Projects

The **IN2CCAM Project** (*Enhancing Integration and Interoperability of CCAM eco-system*), presented by Maria Pia Fanti (Polytechnic University of Bari), started in 2022 and finished in 2025, examined how CCAM technologies can enhance traffic management operations through real-time data exchange and cooperative services. The project focused on enabling traffic managers to access richer, more dynamic information from connected

and automated vehicles, allowing them to anticipate congestion, optimise traffic flows and respond more effectively to incidents.

Key elements included:

- Real-time V2X communication enabling vehicles and infrastructure to share situational awareness.
- Predictive traffic control, using CCAM data to forecast traffic states and adjust strategies proactively.
- Cooperative manoeuvres, such as coordinated merging or lane changes, supported by shared information.
- Integration with existing traffic management tools, ensuring compatibility with current operational systems.

The project demonstrated that CCAM can significantly enhance the capabilities of traffic management centres, but only if data formats, communication protocols and operational procedures are harmonised. The discussion highlighted the need for interoperability, standardisation and cross-border alignment to ensure that CCAM-enabled services can scale across Europe.

The **CONDUCTOR project** (*Fleet and traffic management systems for conducting future cooperative mobility*) also started in 2022 and finished in 2025 and focused on the integration of CCAM technologies into fleet operations, addressing how connected and automated mobility can support logistics, public transport and shared mobility providers. The project explored how fleets can benefit from cooperative perception, coordinated driving strategies and improved routing and dispatching.

Key elements included:

- Enhanced routing and dispatching, using CCAM data to optimise fleet movements and reduce delays.
- Cooperative perception, allowing vehicles to share sensor information and improve safety in complex environments.
- Energy-efficient driving strategies, supported by predictive information from infrastructure and other vehicles.
- Operational coordination, enabling fleets to interact more effectively with traffic management centres.

The project demonstrated that CCAM-enabled fleets can operate more safely and efficiently but only if supported by robust communication infrastructure and harmonised data-sharing frameworks. The session emphasised that public authorities, fleet operators and technology providers must collaborate closely to ensure that CCAM services are deployed in a way that supports both operational needs and broader mobility goals.

Session summary

Across the presentations, a shared conclusion emerged: integrating CCAM services into traffic management and fleet operations is essential for achieving safer, more efficient and more sustainable mobility but it requires coordinated action across technology, governance, and infrastructure.

Key takeaways included:

- Real-time data exchange is fundamental for cooperative mobility. Without continuous communication between vehicles and infrastructure, CCAM services cannot deliver their full benefits.
- Interoperability and standardisation remain major barriers. Common data formats, communication protocols and operational frameworks are needed to ensure cross-border and cross-system compatibility.
- Large-scale validation is essential. Real-world pilots, digital twins, hardware-in-the-loop testing and cross-border demonstrations are needed to build trust and regulatory confidence.
- Public authorities play a central role in enabling deployment, ensuring data governance and coordinating traffic management strategies.
- Collaboration is critical. CCAM deployment requires joint efforts from industry, research organisations, fleet operators and public authorities.

The session reinforced that CCAM integration is not only a technological challenge but also an organisational and governance one. To accelerate deployment, Europe must invest in interoperable systems, scalable validation approaches and coordinated implementation strategies that support both traffic managers and fleet operators.

Parallel session 18:
Reducing severe injuries and long-term consequences of road crashes

IMPROVA | ProtAct-Us

SUMMARY BY MARGRIET VAN SCHIJNDEL (EINDHOVEN UNIVERSITY OF TECHNOLOGY)

Introduction

Session 18, on **Reducing severe injuries and long-term consequences of road crashes**, took place on the second day of the conference, February 11th. Both projects presented address the call topic HORIZON-CL5-2023-D6-01-12 (New ways of reducing serious injuries and the long-term consequences of road crashes). The call topic relates to the ambitions of the CCAM Partnership to increase road safety, while being part of the Destination on Safe, Resilient Transport and Smart Mobility services for passengers and goods. The improvement of road safety often has had a focus on imminent injuries sustained. This session focussed on the longer-term injuries sustained. The ambitions are to deliver:

- Validated mechanisms of personal injuries leading to significant long-term consequences, for all road users;
- An established system for classification of long-term injuries, including methods for follow-up of personal injuries for the required time after a crash;
- Validated tools and methods for the assessment of injuries leading to long-term consequences, such as upgraded virtual human body models;
- Preconditions to develop policy, regulatory and standard requirements for the purpose of reducing serious injuries, particularly those with long-term consequences

Thus, the projects presented are to contribute to a general upgrade in protection for all road users through safe and robust countermeasures and solutions. They do address a key topic from the Work Programme Destination to drastically decrease the number of transport accidents, incidents and fatalities towards the EU's long-term goal of moving close to zero fatalities and serious injuries by 2050, even in road transportation (Vision

Zero), including the more focussed ambition to avoiding risks, collisions and finding new ways of reducing long term consequences of road crashes.

Projects

The **IMPROVA project** (*injury mitigation to promote vision-zero achievement*) was presented by Simona Roka, IDIADA. IMPROVA stands for Injury Mitigation to PROmote Vision-zero Achievement. The project runs from June 2024 till May 2028.
Project objectives include the identification of the impact of serious injuries and long-term consequences (LTC) due to traffic accidents, data collection and assessment, assess risks, provide input to policies. All in all, IMPROVA strives to address and mitigate the long-term consequences associated with road traffic injuries.
The search for relevant databases revealed 54 databases, of which 6 contain explicit LTC information. The first deepened analysis of psychological LTC from literature and GIDAS database was presented, as well as a first Policy Recommendation on child/adult protection in buses in the case of front crash or rollover. Furthermore, IMPROVA organised three workshops and events. IMROVA identified the most prevalent injuries leading to LTCs for pedestrians and concluded its preliminary analysis comparing HBM and standard impactors for pedestrian safety. IMPROVA strives for the following impacts:

- Safer Vehicles: Advancement of test procedures and Human Body Models (HBMs) to better capture injury mechanisms;
- Safer people: Support to PPE strategies and behaviour change measures through injury evidence;
- Post-Crash Care: Development of first responder guidelines based on injury patterns and long-term outcomes.

The **ProtAct-Us** (from long term consequences of road crashes) project (*ProtAct-Us from long-term consequences of road crashes*) was presented by Werner Leitgeb, Virtual Vehicle. The project runs from June 2024 until May 2028. The project objective is protecting all Road User Groups from serious injury and long-term physical, cognitive and mental health consequences of road crashes through innovatively interlinked research action between medical and engineering methods. In more detail, the project aims to deliver:
Road user specific Countermeasures development & effectiveness assessment

- Upgraded protection solutions and countermeasures for all road users
  - Improved post-crash treatment
  - Early detection of cognitive and mental health issues;
- Socio Economic cost reduction of long-term consequences of injury for physical issues, cognitive impairment and mental health issues.

The work presented has a focus on

- Medical data correlation, standardisation and classification of long-term physical, cognitive and mental health consequences of road crashes;

- Robust and reliable assessment tools and methods allowing for effective countermeasure development for all road users;
- Reduction of long-term consequences and related social cost of road crash related injuries for all road users.

Results presented include a preliminary assessment concept and use case definitions for user groups, such as pedestrians, users of micro-mobility including motorcycles, occupants of passenger cars and occupants of passenger transportation systems such as shuttles. A methodology with multi sensor data collection scheme, injury metrics from long term consequences, guidelines for risk assessment and evaluation of safety measures was presented. Furthermore, preliminary results were shown for engineering tools and methods as well as virtual and physical testing procedures. Ongoing developments regarding countermeasures were discussed.
ProtAct-Us aims to have impact via road user specific countermeasures (development and effectiveness assessment), and the understanding that the topic of road safety does not stop at the crash site – injuries and related consequences are a continuing issue.

Conclusion

During **the Q&A session**, it was noted that both projects address the same call topic. Therefore, the coordinators strive for alignment, avoiding overlap and maximising impacts of the two projects. Long Term Consequences of road crashes have been studied only to a very limited extent. Thus, well organised knowledge exchange (e.g. in the IMPROVA Knowledge Base Forum) and ensuring to have the same understanding of terminology is of utmost importance. Having access to the relevant data is not that obvious, as in many cases, the Long Term Consequences are insufficiently captured in data and reports. Both physical and psychological effects are to be taken into account. Current crash testing, using dummies, is not yet including LTC. When this will be included, it needs to be ensured that gender and age diversity are taken into account.

In summary, the session discussed two projects focussing on the Long Term Consequences of road accidents, a field still unexplored to a large extent. The effects for crash victims and for society are still underestimated, only partially brought to light. More is needed to effectively counteract those LTCs, both on a policy level and on an industry level. Finding the right data, metrics and scales is an ongoing challenge. It is suggested that future research should develop harmonised ways to do this. Future research should also take next steps in developing effective tools and methods leading to countermeasures. The projects aim to provide a solid foundation for future work, both still having one or two years of further activities.

Parallel session 19:
Future proof freight transport: autonomous multimodal supply chain, freight flow integration and low energy operations

AUTOSUP | AutoMoTIF | ADMIRAL | TRACE

SUMMARY BY GIUSEPPE LUPPINO (ALICE)

Introduction

The session addressed how European freight transport can move from fragmented, mode-specific innovation towards integrated multimodal operations, combining automation, interoperability, freight flow integration and measurable energy/emissions reductions. In the scene-setting, the European Commission framed the four projects as complementary contributions to the Clean and Digital Transport Transition, notably by reducing "silo effects" in automation deployment, enabling data-enabled decision support (including digital twins) and supporting replication across hubs/corridors with credible sustainability performance assessment.

Projects

AUTOSUP (*Preparing the ground for AUTonomous Multimodal SUPply Chains*) was presented by Ilias Gkotsis (Inlecom Innovation) as a 36-month Horizon Europe action (project ongoing). The project objective is to enable seamless multimodal automated freight operations by defining operational requirements and providing decision-support and governance mechanisms that reduce fragmentation and investment risk. Mr. Gkotsis highlighted results around a structured requirement set and barriers, a taxonomy of automation technologies, and a Decision Support System approach combining modelling (including digital-twin-based elements), information-flow analysis and KPI-driven comparison of "what-if" scenarios for automation deployment in multimodal hub contexts.
The methods rely on stakeholder engagement (workshops/interviews/questionnaires) combined with modelling/simulation to connect operational needs to quantifiable impacts. Expected impacts were framed as lower deployment uncertainty and improved replicability of automation pathways across European hubs and corridors, with evidence

to support cleaner and more efficient operations through prioritised investment choices. During the Q&A, AUTOSUP's positioning was clarified as technology-agnostic: the aim is not to implement a single propulsion/automation technology, but to support decision-makers with comparative assessment of options against performance and sustainability KPIs before committing to real-world deployment.

AutoMoTIF (*Automation towards Multimodal Transportation and Integration of Freight*) was presented by Angelos Amditis (ICCS) as a 36-month Horizon Europe RIA starting June 2024 (project ongoing). The project objective is to define operational automation requirements for seamless multimodal freight and to quantify the benefits, impacts and adoption conditions of integrated automation through realistic simulations and impact assessment. Mr. Amditis reported results including the establishment of a harmonised KPI framework (operations, environment, economy, safety/security, societal acceptance), the definition of realistic use cases, and an open, modular reference architecture for digital twins intended to support interoperability and phased capability building. Methods emphasised simulation and digital-twin-based assessment to test alternative scenarios and technology combinations before physical deployment decisions. Expected impacts were described as reducing investment risk and accelerating scalable adoption by providing evidence-based guidance and interoperable architectural blueprints aligned with EU transition objectives. In the Q&A, AutoMoTIF reinforced the "automation across layers" logic and the importance of open architectures to avoid non-scalable, project-specific solutions, enabling organisations to plan incremental investments and compare options against KPIs rather than lock-in to a single approach.

ADMIRAL (*ADvanced MultImodal maRketplAce for Low emission and energy transportation*) was presented by Ville Hinkka (VTT) as a project approaching its end, with pilots in Portugal–Spain, Slovenia–Croatia, Lithuania and Finland. The project objective is to deploy a multimodal logistics marketplace that enables comparison and procurement of greener logistics services while embedding sustainability data needed for reporting. Results highlighted by Mr. Hinkka focused on the marketplace and pilot outcomes demonstrating how improved coordination, transparency and decision support can reduce emissions through better asset utilisation and more informed modal/service choices, including AI-based optimisation in terminal operations (Finnish pilot) to reduce internal movements and associated energy use. The methods are pilot-driven, combining real-world deployment with analytics/AI and standardised information flows so emissions and performance can be compared in operational procurement decisions. Expected impacts were framed as lowering practical barriers to decarbonisation by making sustainable options visible, comparable and actionable for shippers and operators, including SMEs. In the Q&A, ADMIRAL's message was connected to the broader point that decision-support mechanisms (including marketplace ranking and AI) can enable cleaner choices without requiring every actor to develop bespoke tools, provided data comparability and trust are ensured.

TRACE (*Towards the integration and harmonization of logistics operations*) was presented by Stathes Hadjiefthymiades, focusing on integrating heterogeneous logistics networks via an intelligent platform and AI modules supporting synchromodal services, dynamic optimisation and shared/open logistics services. The project objective is to enable seamless collaboration across currently independent logistics operations by harmonising processes, orchestrating shared services and standardising key logistics events/statuses required for cross-network coordination. Results highlighted by Mr. Hadjiefthymiades included demonstrators and the emphasis on standardising event and disruption messages so that platforms can exchange actionable information, supporting network-level integration rather than isolated optimisation within single organisations. The methods combine real-world demonstrators with platform development and interoperability/standardisation work on events and statuses to enable operational orchestration across networks. Expected impacts were framed in terms of improved utilisation, resilience and significant energy/emissions reduction potentials through collaborative optimisation and shared services, not relying solely on asset renewal. In the Q&A, TRACE clarified that demonstrators can include purely electric assets and that the platform approach is meant to support selecting and coordinating heterogeneous means and services along the chain, consistent with a technology-agnostic integration logic.

The session converged on a common conclusion: future-proof freight transport depends less on individual automation technologies and more on system integration conditions—interoperable data/event exchange, shared operational semantics and decision-support tools (digital twins, simulation, marketplace logic) that quantify impacts and reduce investment risk. A consistent lesson learned is that scaling from pilots to hub/corridor deployment requires proactive standardisation and governance to ensure data comparability, trust and replicability, supporting EU objectives for the clean and digital transition in multimodal logistics. Future research needs highlighted by the discussion include deeper corridor-scale validation, stronger alignment on event/data models and interoperability standards, and further evidence on how combined automation and low-emission operational strategies can be operationalised in decision workflows that remain accessible for heterogeneous networks and SMEs.

Parallel session 20:
HMI and in-vehicle perception

AWARE2ALL | 4EVENTS | HEIDI

SUMMARY BY SARAB TAY-GUYOT (VALEO)

Introduction

This session addressed the critical development of HMI (Human-Machine Interaction) and robust onboard perception as key enablers for safe and reliable highly automated vehicles. The topic is central to the digital transition of the transport sector, specifically focusing on how vehicles perceive complex environments and communicate effectively with both drivers inside the vehicle and vulnerable road users (VRUs) outside. These advancements align perfectly with the CCAM Partnership's Strategic Research and Innovation Agenda by tackling core mobility challenges beyond simple technological improvement. By prioritizing inclusivity, trustworthiness, and human-centric interaction, the session highlighted how improved decision-making technologies can build the necessary trust and safety required for autonomous vehicles to operate in complex, mixed-traffic environments, ultimately fostering broader societal acceptance and adoption.

Projects

Presented by Oihana Otaegui from Vicomtech, the **AWARE2ALL project** (*Safety systems and human-machine interfaces oriented to diverse population towards future scenarios with increasing share of highly automated vehicles*) started in November 2022 and concluded its 36-month duration in October 2025. The project's main objective was to develop safety systems and human-machine interfaces (HMI) tailored to a diverse population, specifically including the elderly and people with impairments. The results highlighted a reduction in the time required to resolve vehicle-pedestrian interactions thanks to the implementation of external HMI. By using digital twins and real-world testing, the team demonstrated that clear communication via external pictograms increases user compliance by over 75%.

These results contribute directly to the CCAM Partnership's KPIs regarding social inclusion and proactive safety in urban areas.
During the Q&A session, the importance of standardizing these external signals was emphasized to avoid confusion during large-scale deployment.

This **EVENTS project** (*ReliablE in-Vehicle pErception and decisioN-making in complex environmental condition)* was presented by Vasilis Sourlas from ICCS and it focuses on robust perception in complex environmental conditions and edge cases. The project started on 1st September 2022, for a duration of 42 months.
The project aims to maintain safe operations even when sensors are degraded or weather conditions are unfavourable. The findings indicate that by using edge computing and 5G connectivity to share data between vehicles, detection accuracy can be improved by 23% to 25%. This collaborative approach allows for the anticipation of obstacles long before they enter the vehicle's direct line of sight, supporting the safety and resilience objectives of the CCAM Partnership. A point raised during the discussion concerned the technical feasibility of running massive AI models in real-time on onboard hardware, which remains a significant challenge.

Presented by Medina Custic from Virtual Vehicle, the **HEIDI project** (*Holistic and adaptivE Interface Design for human-technology Interaction*) started in September 2022 and concluded in August 2025.
The HEIDI project explored AI explainability and the seamless transition between automated and manual driving. The project's objective was to create a cooperative communication system between the vehicle and its environment to ensure high-quality interaction. The researchers emphasized that successful deployment depends on translating technical innovations into standardized industrial products. The project used AI algorithms capable of predicting pedestrian intentions up to four seconds in advance, significantly enhancing proactive safety. The discussion also touched upon the emergence of generative AI as a potential gamechanger for future research phases, moving from probabilistic detection to semantic reasoning.

Session Summary and Conclusion

The session demonstrated that while technical building blocks are reaching a high level of maturity (TRL 6-7), the next major challenge lies in standardization and large-scale deployment. The session was highly useful in showcasing concrete advancements in inclusive HMI and collaborative perception. Future research must now focus on integrating generative AI capabilities while resolving onboard computing power constraints to support these complex systems in dense urban environments. It is recommended that future calls for proposals prioritize the harmonization of communication protocols between different manufacturers to ensure universal safety.

Parallel session 21:
Circularity: from methods to infrastructure

SUMMARY BY GLADYS MOREAC-NJEM (RENAULT GROUP, AMPERE)

Introduction

Session 21, held on Day 2 of the conference, addressed the theme "**Circularity: from methods to infrastructure.**" The session brought together four contributions that each explored, in their own way, the transition from circularity methodologies to the infrastructure required for their implementation.

The projects TranSensus LCA, ZevRA, BASE, and LIAISON collectively examine how coherent life cycle approaches, data frameworks, and material loops can support the shift toward more circular industrial systems. TranSensus LCA focuses on aligning and refining LCA methodologies for emerging technologies, while ZevRA investigates circular pathways for zero-emission vehicles, including improved recyclability, reuse strategies and the management of critical raw materials. In parallel, the BASE project explores how robust and traceable material loops can be established at industrial scale, and LIAISON works on enabling interoperable data infrastructures that connect multiple actors across value chains. Together, these initiatives demonstrate how methodological advances must be complemented by shared infrastructures to make circularity truly operational across sectors.

Projects

TranSensus LCA (*Towards a Common and Consensus Based LCA Methodology for Zero Emission Road Transport*) was presented by Thilo Bein from Fraunhofer LBF. The project develops a harmonised European methodology for environmental and social LCA of zero-emission vehicles, providing a shared framework endorsed by researchers and OEMs. It defines comprehensive requirements for E-LCA and S-LCA and offers an ontology and data management structure covering all life cycle stages, from production to end of life.

Guidelines include technology coverage (BEV, FCEV, FC-REEV, BEV-ERS, H_2ICEV), functional units, electricity and hydrogen modelling, use-phase energy consumption, and non-exhaust emissions. The methodology can be applied at two adherence levels depending on reporting completeness. Road testing ensured clarity and consistency across requirements and modelling hierarchies. TranSensus LCA is expected to enhance transparency and comparability of sustainability information, supporting wider industry uptake and enabling the market deployment of zero-emission mobility solutions.

ZEvRA (*Zero Emission electric Vehicles enabled by harmonised circularity*) is a Horizon Europe project led by Fraunhofer IWU that aims to improve circularity across the entire EV value chain. With 28 partners from 13 countries, the project develops a Design for Circularity methodology, a circularity assessment tool, and zero-emission material solutions across steel, aluminium, plastics, glass, and rubber. Technical achievements include 0% virgin aluminium alloys, high-PCR polymer components, repurposed steel parts, and lower-impact glass manufacturing. A modular vehicle architecture supports easier disassembly and material recovery. The project also deploys a training platform and engages stakeholders across Europe. ZEvRA's expected impacts include significant reductions in virgin materials and CO_2 emissions, supporting large-scale adoption of circular practices in the EU automotive sector.

BASE (*Battery Passport for Resilient Supply Chain and Implementation of Circular Economy)* is a 36-month Horizon Europe project involving 19 partners from 12 countries. It develops a trusted Digital Battery Passport and a Gaia-X aligned dataspace enabling secure, interoperable, and traceable battery information across four use cases (e-bus, frugal EV, marine, stationary). Key tools—DBP platform, circularity calculator, LCA tool, ESG toolkit, and AI-based lifetime predictors—progress from TRL 5 to 7. BASE defines 116 battery data attributes and demonstrates real-world applications such as a marine battery passport prototype. The project strengthens 4R decision-making, supports second life and recycling, and reduces regulatory uncertainty, laying the foundation for large-scale European battery passport deployment.

LIAISON (*Lowering transport envIronmentAl Impact along the whole life cycle of the future tranSpOrt iNfrastructure*) is a €5 million Horizon Europe project aiming to decarbonise transport infrastructure across its full life cycle. It develops methods and near-market technologies to reduce resource consumption by over 20%, reuse all available materials, enable prosumer-type infrastructure, and support market uptake through standards and procurement tools. Circular solutions include bio-asphalt and a circular low-noise railway track using 100% reused materials. Industrialised solutions demonstrate geopolymer concrete with 76.9% lower CO_2 emissions. Smart O&M innovations include energy-optimised tunnel ventilation, digital twin simulation tools, and an AI-powered pavement-distress detection system. Together, these solutions reduce emissions,

improve durability, and lower maintenance costs while supporting the transition to circular, low-carbon transport infrastructure.

The **Q&A session** highlighted shared challenges across the projects regarding circularity, data availability, and interoperability between European and international systems—particularly Catena X and the Chinese battery passport infrastructure. Participants emphasized the difficulty of ensuring data access while protecting confidentiality, the need to build reliable supply chains for secondary raw materials, and the importance of developing adequate digital and physical infrastructures, especially for smaller actors. Several contributors stressed the necessity of embedding the digital product passport from the very beginning of product design and aligning strategies across sectors to enable a functional circular value chain. Social acceptance, economic feasibility—especially for early stage recycling—and harmonisation of methodologies were recurring themes, along with the need to move from local or project level advances to system level implementation. Finally, the discussion underlined the importance of stronger industry involvement, earlier alignment between research and industrial needs, clearer business models, and closer public private cooperation to accelerate the uptake of solutions and reduce fragmentation across Europe.

Conclusion

Together, the four projects presented in this session illustrate Europe's ambition to accelerate the shift toward a circular and low carbon mobility ecosystem. TranSensus LCA, ZEvRA, BASE and LIAISON provide complementary advances—from harmonised life cycle methods and circular material solutions to interoperable digital infrastructures and low impact transport systems.

Their combined outcomes show how methodological innovation, data driven infrastructures and technological solutions can strengthen resource efficiency, improve transparency and enable large scale adoption of circular practices. Insights from the Q&A session also highlighted the need for robust data accessibility, interoperable standards, viable business models and stronger collaboration across the value chain to turn these advances into widespread implementation.

Collectively, these initiatives reinforce the EU's ambition to build a more resilient, efficient, and sustainable mobility landscape.

Parallel session 22:
CCAM Demos

SUMMARY BY PETER URBAN (IKA RWTH-AACHEN)

Introduction

The session on "**CCAM Demos**" held on 11th February, focussed on the real-world demonstration of connected and automated driving, which is understood as a key factor for the future competitiveness of the EU automotive sector. While the two projects presented in this session, Hi-Drive and MODI, have substantial funding budgets of 30 and 23 M€ respectively, they are still intended as intermediate steps towards the future large-scale demonstrations of connected, cooperative and automated mobility (CCAM) to be funded under HORIZON-CL5-2026-10-D6-01. These large-scale demonstrations are to combine the most promising CCAM use cases from earlier projects, such as Hi-Drive and MODI, in which technical maturity has still been advancing.

Projects

In this sense, the recently completed **Hi-Drive project** (*Addressing challenges toward the deployment of higher automation*) followed the main objective of extending and defragmenting the Operational Design Domain (ODD) of automated driving by further developing and evaluating enabling technologies. Two Hi-Drive representatives, Marcel Sonntag and Natasha Merat, gave insights in key results, which they achieved during the runtime of the project from July 2021 to November 2025. These include the estimation of the effects of automated driving and its enabling technologies from the technical and the user perspective as well as better understanding of user requirements and limitations in the interaction with automated vehicles. Based on harmonised simulation models calibrated with real-world data, Hi-Drive could show very significant benefits of enhanced automated driving functions on privately used passenger cars, in particular from accident cost savings, but also from increased comfort and the possibility for drivers to carry out non-driving related activities. These benefits clearly exceed the cost of implementing

automated driving in most scenarios. Moreover, Hi-Drive has provided new frameworks and methodologies for studying user response as well as the related conclusions from two global surveys and more than 60 empirical studies with a focus on comfort and motion sickness, driver monitoring and related human-machine interfaces as well as external communication by automated vehicles. While this will facilitate the design of more human-centric systems and interfaces on such vehicles, Hi-Drive has also paved the way towards closer collaboration within the EU automotive sector on automated driving, sharing data and enabling joint evaluations. This achievement on the strategic level is expected to have a significant positive impact on the implementation of the future large-scale demonstrations of CCAM. At the same time, the subsequent discussion also revealed that some incentives may be necessary to let private car buyers benefit directly from the socio-economic profitability of automated driving and encourage their buying decisions accordingly.

With logistics operations, the **MODI project** (*A leap towards SAE L4 automated driving Features*) focusses on a different use case of CCAM. The project, that started in October 2022 and ending in March 2026, was presented by its coordinator Ragnhild Wahl. MODI aims to demonstrate and validate the cross-border deployment of Level 4 automated freight transport in real cross-border logistics operations across a European corridor from Rotterdam in the Netherlands to Oslo in Norway. In addition to advances in technological maturity, a main achievement is the integration of automated vehicles with ports, terminals, infrastructure and regulatory frameworks to enable scalable deployment across a full logistics corridor. This has been enabled by close collaboration between stakeholders to achieve a common understanding and co-create solutions with OEMs, road and public authorities, technology and service providers, logistics and terminal partners, as well as university and research organisations. MODI is expected to accelerate the safe and scalable deployment of automated freight transport, providing a shared knowledge base for regulation and infrastructure planning in a book of recommendations. MODI directly supports the CCAM Partnership by moving automated driving from research to corridor-scale demonstrations, contributing to the Partnership's Strategic Objective SO4 (Better coordination of public and private R&I actions, large-scale testing and implementation plans in Europe) as well as to its Operational Objective OO4 (Large-scale demonstrations of user-oriented and well-integrated CCAM solutions for mobility of people and goods in at least thirty demonstration sites across Europe by 2030). The subsequent discussion underlined amongst others the role of digitalisation as a key enabler, not only for the automation of the driving task, but also for replacing drivers in all their other tasks in logistics operations.

Conclusion

In summary, this session with only two projects nicely highlighted the socio-economic benefits of CCAM, the importance of taking the users' perspective in the development of

automated passenger cars, and the need for full eco-system integration in the automation of logistics operations. As an underlying imperative, the need to speed-up became apparent to proceed from advancing technical maturity towards large-scale demonstrations and the deployment of CCAM on European roads. The Competitiveness Fund under the EU's new Multiannual Financial Framework may offer chances in this regard, while the need for Europe to accelerate is urgent.

Parallel session 23:
User-Centric Innovations for Zero Emission E-Commerce

Claudia de Stasio	Bartosz Kozuch

SUMMARY BY MARION COTTET (ALICE)

Introduction

This session explored how behavioural insights, co-design approaches and improved communication strategies can accelerate the uptake of zero-emission delivery and return solutions in e-commerce. The session emphasised how decarbonising last-mile logistics requires not only technological solutions but also behavioural change and coordinated action between consumers, retailers, logistics operators and cities.

Projects

CodeZERO, (*co-design of e-commerce last-mile delivery and return options with zero emissions*) presented by Claudia de Stasio (TRT Trasporti e Territorio), aims to co-design zero-emission last-mile delivery and return options based on a deep understanding of consumer behaviour. The project conducted 43 cognitive-task interviews in four countries and a large-scale survey of 10,000 online shoppers across ten European countries, followed by co-design activities in Milan, Utrecht, Antwerp and Oslo involving retailers, logistics operators, consumers and local authorities. The results include practical communication guidelines for retailers and carriers, as well as a guide for local authorities outlining regulatory and stakeholder-engagement levers. Using behavioural research and real-world urban case studies, the project demonstrated how clearer communication and collaborative governance can increase the uptake of sustainable delivery options. It contributes to partnership objectives by addressing demand-side barriers to zero-emission urban logistics. The Q&A highlighted challenges around harmonised emission calculations and consistent communication practices.

GreenTurn (*Enabling stakeholder-centric zero emission e-commerce delivery and return practices through transparent and collaborative supply chains*) presented by Bartosz Kożuch (Łukasiewicz-Poznań Institute of Technology), seeks to enable stakeholder-centric zero-emission e-commerce through transparent and collaborative supply chains. Through cross-country consumer research and behavioural analysis, the project identified behavioural thresholds and trade-offs influencing the choice of low and zero-emission delivery options. It developed validated consumer personas and user-centred design principles, identified gaps in current digital communication practices, and proposed pilot-ready concepts and an evaluation framework co-created with retailers, logistics operators and cities. The findings underline the importance of transparency and tailored communication in influencing user choices. Discussion points included the scalability of personas and the need for standardised environmental information.

Session Summary and Key Takeaways

The session highlighted that zero-emission e-commerce cannot be achieved through technological innovation alone but requires close co-design and collaboration between users, cities, retailers and logistics operators. The session highlighted that although consumers are not opposed to sustainable delivery options, their awareness of environmental and social impacts remains limited. Current e-commerce practices (default home delivery, limited visibility of greener alternatives and free returns) often incentivise less sustainable choices. Price remains the dominant decision factor overall, but large-scale, cross-country surveys reveal significant heterogeneity among consumers. Distinct profiles require differentiated communication and incentive strategies.

A key insight is that sustainability alone does not drive behaviour change: greener options are more likely to be selected when they remain affordable, time-efficient and easy to understand. The checkout process functions primarily as a trade-off environment rather than a moral decision point, highlighting the importance of choice architecture, default settings and clear, non-moralising communication. Returns emerged as a particularly high-impact intervention area, with even small incentives showing potential to reduce return rates.

The session also highlighted a structural challenge: retailers and logistics operators face uncertainty in communicating environmental performance due to the lack of harmonised standards and the risk of greenwashing accusations. Strengthening methodological clarity, standardisation of emission calculations and regulatory guidance is, therefore, critical to scaling transparent and credible zero-emission delivery options.
Overall, the two projects, working in complementarity, demonstrate that combining behavioural insights, co-creation, real-life piloting and policy alignment is essential to making zero-emission e-commerce not only technically feasible but commercially viable and socially acceptable. Looking ahead, further research is needed to harmonise emission

calculation methodologies, test large-scale implementation of user-centred communication tools and assess long-term behavioural change and system-level impacts in real operational environments.

Parallel session 24:
Novel concepts for frugal, safe and smart vehicle design

SUMMARY BY OLIVER LAH (TECHNISCHE UNIVERSITÄT BERLIN)

Introduction

Held on Thursday, 12th February 2026, from 09:00 to 11:00 in the Auditorium, this RTR 2026 session was moderated by Guido Sacchetto (EC DG RTD) and Oliver Lah (Technische Universität Berlin). The panel brought together three complementary EU-funded projects — GIANTS, ZEV-UP and SALIENT — to examine how vehicle innovation can deliver affordability, safety, sustainability and industrial relevance at the same time. Positioned within the broader RTR Conference focus on EU-funded road transport research and its future impacts, the session highlighted how design choices at vehicle level are becoming central to Europe's wider mobility transition.

Projects

The presentations showed different but converging pathways towards frugal and user-oriented zero-emission mobility. **GIANTS** (*Green Intelligent Affordable New Transport Solutions*) presented its work on a modular, scalable zero-emission L-type vehicle platform for urban and suburban mobility, designed to be mission-centric and adaptable to both advanced and emerging markets. Its approach combines lightweight architecture with portable 48V batteries, scalable e-drivetrains, solar roof integration and a vehicle configuration tool, all intended to reduce cost of ownership and improve usability. **ZEV-UP** (*Frugal Zero-Emission Vehicles for the Urban Passenger challenge*) complemented this with its frugal battery electric vehicle concept for passenger and goods transport, developed in three variants and supported by a scalable chassis, modular platform, swappable battery system and a digital twin framework for development and operation. Together, these projects illustrated that affordability is not being pursued through

simplification alone, but through modularity, right-sizing and better alignment between vehicle architecture and actual use cases.

SALIENT (*Novel Concepts for Safer, Lighter, Circular and Smarter Vehicle Structure Design for Enhanced Crashworthiness and Higher Compatibility*) added a crucial safety and circularity dimension to the discussion. Its presentation showed how lighter vehicle structures can still improve crashworthiness and compatibility in mixed traffic, with a strong focus on advanced materials, front-end structure design, eco-design and active safety integration. Publicly shared results presented around the session pointed to 42.7% lightweighting at front-end-structure level, 11.6% at body-in-white level, 95% recyclability by weight and 25% energy savings in manufacturing, alongside CAE-validated crash performance at multiple impact angles. Across the exchange, three recurring themes stood out: first, frugality must be understood as purposeful engineering rather than mere cost-cutting; second, digital twins are becoming an increasingly important tool for validation, optimisation and faster development cycles; and third, smaller and lighter vehicles will only gain wider acceptance if high safety standards are demonstrated convincingly.

Conclusion

Overall, the session underlined that next-generation vehicle design is moving towards a more integrated logic in which modularity, circularity, safety and digitalisation are treated as mutually reinforcing rather than competing objectives. The three projects showed how EU research is helping define a new design space for urban mobility: lighter, more affordable, more adaptable and more sustainable, without compromising safety. The session therefore offered a strong illustration of how research and innovation can support both Europe's climate goals and its industrial competitiveness, while keeping end-user needs at the centre of the transition.

Parallel session 25:
European Innovation Council (EIC)

MagCharge	ELONROAD

SUMMARY BY FRIEDEL KOERFER (MAN)

Introduction

For the first time a session of the RTR conference dealt with topics of the European Innovation Council (EIC), which is an EU initiative under Horizon Europe that supports breakthrough and high-risk innovations with the potential to create new markets and scale globally.
The projects presented are funded by the EIC Accelerator, which is the flagship programme of EIC for startups and SMEs, providing grant funding and equity investment to help bring disruptive technologies from prototype to market. It targets deep-tech. innovations with strong commercial potential, supporting development, demonstration, and scale-up while bridging the gap between research and private investment.

Projects

Elonroad (*Electric road system*) presented their initiative on an on-the-go charging system, which enables continuous conductive charging during both stationary and dynamic operation. The challenge of electrification of heavy-duty vehicles in ports and other closed-loop logistics environments are the high power demands and the charging-related downtime.
The project advanced static parking chargers, which were demonstrated in real port operations in Oslo and Malta; an overseas pilot at the Port of Long Beach, USA demonstrated a submerged Electric Road System (ERS) from prototype to industrial-grade solutions as well. The systems were validated across multiple heavy vehicle types and with leading OEM partners.
Independent studies with port operators show up to 44% reduction in total cost of ownership, driven by reduced fleet size, smaller batteries, and improved asset utilisation. Early deployments delivered 35 MW.h of clean energy and avoided approximately 28

tonnes of CO_2, with fleet-level analyses confirming a pathway to ≥12% emission reduction at scale.
The project also established industrial manufacturing readiness and contributed to European standardisation, demonstrating a scalable pathway for decarbonising port operations without operational downtime

MagCharge (*Magnetizable concrete for wireless charging*) presented a wireless charging technology based on magnetizable concrete, developed by the company MAGMENT. The solution integrates recycled magnetic ferrite particles into cement or asphalt, enabling high efficiency inductive charging for both static and dynamic electric vehicle operation directly from the ground infrastructure.
The project targets industrial and logistics applications, particularly intralogistics vehicles such as forklifts and automated guided vehicles, where charging downtime, battery oversizing, and operational interruptions remain key barriers to electrification.
Project objectives include achieving ≥95% wireless power transmission efficiency, reducing charging downtime by approximately 25%, and validating the technology through large-scale pilots with industrial partners.
Key innovations include horizontal ground embedded charging pads, wide alignment tolerance for moving vehicles, and modular receiver coils that enable scalable vehicle integration. Results demonstrate reduced fleet size, lower battery capacity requirements, improved energy efficiency, and a projected return on investment of 2–3 years. Overall, MagCharge provides a scalable, sustainable pathway for wireless electrification aligned with EU climate and mobility goals.

Conclusions

In this session, two projects funded under the European Innovation Council (EIC) Accelerator programme were presented, each carried out by a single SME as the sole beneficiary. The session effectively showcased two alternative and, to some extent, competing technologies for charging electrified vehicles in restricted environments such as ports, industrial logistics areas, and production sites. Elonroad presented a conductive charging approach focused on delivering high and reliable power transmission, whereas MagCharge introduced an inductive material-based solution offering greater flexibility in routing and the design of charging zones.
Both projects demonstrated significant reductions in installed battery capacity requirements and charging-related downtime within their respective use cases. These improvements translate into compelling business cases, not only for end users but also for the companies developing and deploying the technologies presented in this session.

Overall, the session provided a strong and practical response to the plenary theme of the previous evening, “From research to market: how to bridge the gap?”, by highlighting innovations that are mature and ready for market entry. The subsequent discussion

further enabled an in-depth exchange on the mechanisms of SME funding through the EIC, enriched by valuable insights from the session co-moderators.

Parallel session 26:
Digitalisation of battery testing, from cell to system level

SUMMARY BY FRANZ GEYER (BMW GROUP)

Introduction

The session "**Digitalisation of Battery Testing: From Cell to System Level**" explored new approaches to improving battery testing and validation through the integration of digital tools, modelling techniques and experimental testing. As battery technologies evolve and development cycles accelerate, more efficient testing strategies are required to reduce costs and improve reliability. The presentations highlighted how digital twins, automated testing workflows and advanced modelling approaches can complement physical experiments to support faster and more efficient battery development.
These developments align with the objectives of the Batt4EU Partnership, which aims to strengthen Europe's battery innovation ecosystem and accelerate the development of competitive battery technologies for clean mobility. By combining digitalisation with improved testing methodologies, the projects presented contribute to more efficient battery research and development while maintaining high standards of safety and performance.

Projects

The **DigiBatt project** (*Digital solutions for accelerated battery testing*), presented by Francesca Watson from SINTEF, focuses on developing digital tools and standardised data approaches to accelerate battery testing and characterisation. The project aims to extract more value from fewer physical tests by integrating automated workflows, digital twins and standardised machine-readable data formats.
The project developed standardised JSON-LD data formats that allow testing equipment, modelling tools and battery software to exchange information efficiently. These formats enable automated workflows where digital models can guide physical experiments. The project also demonstrated non-invasive parameterisation methods that allow digital

twins to be generated more rapidly from experimental data. Results indicate reductions of 30–40% in characterisation effort, 50% fewer ageing tests and significant reductions in safety testing costs.

The **FASTEST project** (*Fast-track hybrid testing platform for the development of battery systems*), presented by Bruno Rodrigues from AVESTA, develops a hybrid testing platform combining digital modelling and physical experiments to accelerate battery system development. The project integrates simulation tools, digital twins and testing infrastructure into a unified framework.
Key developments include an intelligent Design of Experiments methodology that reduces redundant tests and improves parameter identification. The project also implemented advanced modelling techniques and a cloud-based infrastructure enabling real-time data exchange between models and testing equipment. Three digital twin demonstrators were developed to support automated test selection and virtual validation of battery systems.

The **AccCellBaT project** (*Accelerated Celland Battery Testing*), presented by Jasmin Kniewallner from AVL List, focuses on accelerating battery development through improved modelling, measurement techniques and digital verification frameworks.
The project demonstrated advanced electrochemical degradation models, thermal and mechanical modelling approaches, and new methods to identify failure modes at the battery system level. A linked data management platform was developed to support continuous verification and validation workflows and enable integration of digital twins within testing processes. Overall, the project aims to reduce battery development time by more than 30% while maintaining automotive safety and performance standards.

The **THOR project** (*Innovative methodology for battery testing*), presented by Lise Daniel from CEA-Liten, focuses on developing a digital twin methodology for battery testing to reduce the need for extensive experimental campaigns.
The project developed high-fidelity physics-based models capable of predicting battery performance, ageing, and safety behaviour from cell to pack level. The models achieve prediction errors below 2% for key performance parameters. Additional work addressed ageing mechanisms such as lithium plating and SEI growth as well as safety modelling for thermal runaway events.

Session Conclusions

The session highlighted the increasing importance of digitalisation in battery testing, demonstrating how digital twins, modelling approaches, and automated testing workflows can complement experimental validation. Across the four projects, a common objective was to reduce testing time and costs while maintaining reliable safety and performance evaluation.

These developments contribute directly to the goals of the Batt4EU Partnership by strengthening Europe's capabilities in advanced battery research and supporting faster and more efficient battery innovation.

Parallel session 27:
Improving traffic management

SUMMARY BY IVO CRÉ (POLIS)

Introduction

The session focused on strengthening the efficiency, sustainability and resilience of the Union's transport system through improved traffic management. It included presentations from projects that answered to call topics that aimed at reducing congestion and air pollution, enhancing road safety, and promoting social inclusion and accessibility across the transport system. The projects also support a greater uptake of new and shared mobility services - integrated with public transport services. Improved multimodal transport network management for both passengers and freight building on effective, resilient and secure network-wide data exchange and traffic management systems, enabling real-time information flows and improved decision-making are the central factor in the projects. The projects look at appropriate governance arrangements ensuring cooperation among relevant stakeholders.

Projects

Luce Brotcorne (INRIA) presented the **SUM project** (*SEAMLESS SHARED URBAN MOBILITY*). She presented key updates from the project's Living Labs in Geneva, Rotterdam, Krakow and Penteli, highlighting newly developed tools, as well as the progress achieved and concrete results delivered in diverse urban contexts. It showcased the Open Data Platform (ODP), a digital tool designed to enable cities and stakeholders to explore and access project data, review and upload implemented measures, and foster knowledge exchange and peer learning; participants were invited to access the platform, including via a QR code, and to explore existing resources or contribute their own. The presentation also outlined the key policy objectives and recommendations identified through the project's activities and set out the long-term vision for the continued use and further

development of the ODP as a sustainable instrument to support data-driven decision-making.

Claudio Roncoli (KU Leuven) presented the **ACUMEN project** (*Ai-aided deCision tool for seamless mUltiModal nEtwork and traffic managemeNt*). ACUMEN is a privacy-preserving, data-driven platform that enables real-time, interoperable data sharing between mobility providers to optimise complex urban transport systems. Using explainable AI, hybrid intelligence and advanced forecasting, it monitors, predicts, and detects incidents across networks with higher accuracy, leveraging data from sources like Bluetooth, drones and traffic sensors. Its Digital Twin platform integrates simulation, anomaly detection and AI-driven decision tools—such as reinforcement learning and trajectory pricing—for smarter network management. Validated in Athens, Helsinki, Amsterdam and Luxembourg, ACUMEN has demonstrated reduced congestion, improved public transport performance and shaped governance frameworks for AI-enabled mobility.

Evangelos Mitsakis (CERTH) presented the **SYNCHROMODE project** (*Advanced traffic management solutions for synchronized and resilient multimodal transport services*). SYNCHROMODE is an AI-powered toolbox for multimodal traffic management, enabling real-time data exchange, predictive monitoring and coordinated decision-making among transport stakeholders. By integrating data fusion, quality assessment, simulation and AI-driven forecasting, it supports proactive management of disruptions and congestion through "what-if" scenario analysis. With a strong focus on governance and interoperability, SYNCHROMODE defines cooperation models, data standards and advanced KPIs to enable coordinated, data-driven operations across authorities and mobility providers. The solutions are validated in pilots in Thessaloniki, South Holland and Madrid, SYNCHROMODE demonstrates how proactive, predictive traffic management can improve network efficiency, resilience, and multimodal coordination in real urban and regional contexts.

Conclusion

The SUM project was asked whether travel time is the only optimisation factor in the SUM tools. This is not the case. Other issues (energy, user preferences) are factored in. The overall goal is to arrive at unique selling propositions of shared modes that are superior to private car ownership and usage.
The presented projects are interesting in view of preparing for Connected and Automated Driving. In addition, ACUMEN includes applications of AI (recognition and location of vehicles, routes between modes etc.) using drone-mounted cameras. The project results are designed in a modular way. These system 'building blocks' can be exploited individually or combined. In this way, they can answer to different needs and answer to different challenges (traffic management related to incidents/road works, urban freight logistics etc.).

Parallel session 28:
Trustworthy CCAM, including AI

SUMMARY BY EMILIA SILVAS (TNO)

Introduction

This session on *Trustworthy CCAM, including AI*, took place on the final conference day (12th February) and brought together projects developing innovations, methods, tools and evidence to make AI-enabled automated driving safer, more secure, transparent and trustworthy. Moderated by Pedro Alfonso Pérez Losa (EC/CINEA) and Emilia Silvas (TNO), it addressed key challenges that still affect the public and legal acceptance of CCAM despite the growing use of AI in vehicle automation. The discussion focused on preventing accidents through safety-critical operations, reducing bias, improving technical reliability, and ensuring privacy-by-design and regulatory compliance. The topic is directly aligned with the CCAM Partnership SRIA ambitions: trustworthy, verifiable; certifiable AI is essential for scaling automated mobility, enabling interoperability across Europe, and strengthening public and regulatory confidence. By designing AI-enabled CCAM in a safe, secure and ethical way, with system-level optimisation in mind, we can also support broader goals such as digitalisation, decarbonisation and the clean transition. The session underscored that without clear approaches to validation, governance, ethics, cybersecurity and behavioural monitoring, AI's mobility potential will not translate into real-world adoption.

Projects

Running from 2022 to 2025, the **AITHENA project** (*AI-based CCAM: Trustworthy, Explainable, and Accountable*) was presented by Oihana Otaegui (VICOMTECH) and focused on trustworthy, explainable and accountable AI for CCAM. It introduced a harmonised methodology to design AI components that are auditable, trustworthy and ready for certification. Using a human-centric approach, the project developed a taxonomy for trust-focused design across automation functions such as data anonymisation,

perception, decision-making, planning and traffic scene understanding. Examples included privacy-preserving anonymisation, explainable perception methods and robust, context-aware decision-making. The project also provided practical guidance for stakeholders (developers, testers, and regulators), along with governance mechanisms to track model provenance and behaviour over time. Results were based on lifecycle engineering practices, structured trustworthiness requirements, and validation across development and testing pipelines, including hybrid and GenAI-based approaches. AITHENA supports the CCAM goals, as expressed in its SRIA, by reducing deployment barriers through reproducible assurance evidence and by translating trustworthiness requirements into actionable processes. Discussion highlighted the role of synthetic data and simulation to complement scarce real-world data, and the challenge of defining meaningful and comparable safety targets for regulators and the public.

The **AI4CCAM Project** (*Trustworthy AI for CCAM*), presented by Arnaud Gotlieb (Simula Research Laboratory), presented by Arnaud Gotlieb (Simula Research Laboratory) started in 2023 with one question: *Is AI an opportunity or a threat?* This project, which finishes in 2026, starts from the fact that AI can be a formidable opportunity but the threat can be a roadblock if fairness, transparency, privacy, safety and loss of human oversight issues are not addressed properly. To address these challenges, the project developed an interoperable AI-for-CCAM framework with two layers: a technical layer (data processing, trustworthy training, scenario management, simulation and digital twins) and a social layer (user acceptance, ethics and social norms). Key outputs include formalized scenarios covering ethical risks, AI models for motion prediction and scene understanding with explainability, augmented and poisoning-aware datasets, and evidence from immersive testing and user studies. The work supports the CCAM goals by combining technical validation with societal acceptance and governance, helping to reduce deployment risk and strengthen readiness for large-scale, safe and acceptable automation. Discussion raised the difficulty of defining "ground truth" for ethical behaviour across cultures and the need to ensure long-term accessibility of datasets and models beyond the lifetime of individual projects.

The **CONNECT project** (*Continuous and Efficient Cooperative Trust Management for Resilient CCAM*) started in 2022 and finished in 2025, it focused on Continuous and Efficient Cooperative Trust Management for Resilient CCAM. The project was presented by Francesca Bassi (IRT SystemX) and started from the challenge of connectivity data trustworthiness, which enables using V2X messages. More specifically it focused on three pillars: 1) the quantification of trust under uncertainty; 2) building the quantification of trust towards evidence; and 3) bringing all components together to have trustworthiness towards the edge. The presenter outlined a trust assessment framework, combining mathematical methods for trust estimation, software implementations and tamper-resistant evidence collection through trusted execution environments. The methodology was demonstrated across different use cases such as Intersection Movement Assist and

Collaborative Cruise Control, the approach balanced trust evaluation with privacy-preserving data sharing. Validation included simulation, hardware-in-the-loop, real-vehicle testing and digital-twin/infrastructure off-loading variants. CONNECT supports the CCAM priorities on secure cooperation, interoperability and dependable system-of-systems behaviour, and has given input to ISO and SAE standardization groups. The discussion raised the needs for further large-scale testing and standardization, which remain key for deployment and large-scale uptake.

Session summary

Starting from questions on how to define acceptable yet realistic safety thresholds for releasing AI-enabled CCAM (and how to ensure AI genuinely improves on-road safety) across the presentations, a shared conclusion emerged: trustworthy AI for CCAM must be addressed not as a single performance metric but as an end-to-end assurance challenge covering data, models, lifecycle governance, cooperative communication, cybersecurity, data trust, situational and context-awareness, and human factors. The session reinforced the need for measurable, repeatable validation, verification and monitoring approaches that can support certification while meeting privacy and ethical expectations.
Discussion highlighted open challenges around safety targets and how to communicate them, the use of simulation and synthetic data for learning and for covering corner cases or improving trust, ethical “ground truth” across cultures, sustainable European data/model sharing beyond project lifetimes/partners, and the balance between regulation, IP and competitiveness. Key needs identified were common European assurance metrics, scalable validation combining real-world and simulated testing, stronger lifecycle auditing and cybersecurity resilience, and long-term federated data/model spaces with standardization. The session also stressed the need for faster collaboration in Europe to strengthen global competitiveness and accelerate trusted CCAM deployment.

Parallel session 29:
Multimodal freight and resilient infrastructure

SUMMARY BY ISABELLE SCHNELL-LORTET (VOLVO GROUP)

Introduction

The SARIL and FOR-FREIGHT projects focus on two, connected issues: **resilience** and **multimodality**.

SARIL addresses the **Resilience of Supply Chains**. In 2023, when the call was issued, various crises, from the pandemic to geopolitical disruptions, had shown the vulnerabilities in supply chains. Therefore, the EU Commission wanted to explore new strategies to diversify transport routes, enhance multimodal solutions, and ensure critical supply continuity under stress, while still complying with the decarbonisation objectives of the sector. Resilience – in all its meaning of Economic and industrial resilience, Climate and infrastructure resilience, Crisis preparedness and shock absorption, is more than ever a priority for the EU policies and it is increasingly taken into consideration as "resilience by design", for instance in the development of the TEN-T corridors, and not as a reaction to a crisis.

The FOR-FREIGHT project tackles one of the challenges of multimodality. To make **multimodal freight transport nodes** more efficient and effective to increase the throughput without expanding the physical assets, as well as to increase flexibility of freight transport, improve service visibility and reduce the average cost of freight transport. As for all the calls, also **enabling** multimodal freight solutions for the **green transition** of the sector, SARIL and FOR-FREIGHT exemplify how EU research funding supports strategic policy goals: advancing a freight transport system that is **environmentally sustainable, digitally enabled, multimodal** and **resilient to future shocks** - ensuring Europe's competitiveness, security of supply and climate commitments are met.

Project presentation

SARIL (*Sustainability And Resilience for Infrastructure and Logistics networks*, Kris Schroven) studies sustainability and resilience for infrastructure and logistics network and aims to set-up methodology and the definition of resilience with KPIs that will quantify both the system resistance against disruptions as well as the environmental burden of freight transport. Recommendations to improve the classic resilience will be made, e.g. synchro-modal approaches. Regional (Italy) and national (Spain/Portugal) scenarios focus on natural hazards which become more threatening due to climate change, the international scenario (Northern/Central Europe) considers the disruptions due to pandemics or wars.

Freight transport is a driver of competitiveness and an essential part of supply-chain and logistics systems. Freight transport is also on a green path, which means stakeholders need to adapt. The EU-funded **FOR-FREIGHT project** (*Flexible, multimodal and Robust FREIGHt Transport*, presented by Georgia Ayfantopoulou/ Sofoklis Dais) aims to help realise this green transition by utilising multimodal freight transport that integrates legacy logistics systems with new technologies. This novel solution will allow better monitoring of goods and emissions throughout the transport process, improved logistics that make freight transport more cost-efficient and sustainable, and decision support for better resource efficiency and adaptability in the changing market.

Conclusion

These two projects are at the core of our current challenges in Europe: competitiveness, resilience, decarbonisation and digitalisation, as highlighted in the ERTRAC Long Distance Freight Roadmap for Competitive, Sustainable and Resilient Road Transport, as well as the SRIA of the CCAM and 2Zero partnerships:

- SARIL - addresses the Resilience of Supply Chains aiming to complement the classic definition of resilience by green aspects;
- FOR FREIGHT tackles competitiveness – improved multi-modal logistics to make freight transport even more cost efficient.

These projects contribute to societal goals, such as improving logistics resilience, enhancing road safety and reducing energy consumption. They are at the forefront of the Physical Internet, data spaces and AI, aiming to streamline road transport across Europe and improve competitiveness of the logistics sector. During the panel session, we have discussed that, to accelerate even more innovations' adoption, we should further work on:

- Tool kits on the shelf (/tailor-made solutions) – capable to address the various stakeholders' needs. This also includes dual use capabilities;
- Engaging with the relevant partners and integrating their information to simplify access to essential data, thereby improving transport flow efficiency;

- AI in the logistics domain – moving progressively into a resilient digital infrastructure;
- Standardisation to enable interoperability and facilitate data exchange in a multimodal context.

The next steps will be to integrate autonomous driving and its predictive capacity, as well as to enhance even more cross-collaboration with other modes.

Parallel session 30:
Physical and digital CCAM infrastructure

SUMMARY BY JULIAN SCHINDLER (DLR)

Introduction

The session "**Physical and digital CCAM infrastructure**" (PDI) was focussing on the results of four Innovation Action projects linked to CCAM Cluster 4, Integrating CCAM into the Transport System. By dealing with PDI, the session needed to bridge the gap between the ambition to enhance safety and efficiency of traffic systems through data sources located outside of the vehicles and the current demand to deploy automated vehicles to the roads as soon as possible, i.e. developed with limited complexity.

Projects

The first presented project, **PoDIUM** (*PDI connectivity and cooperation enablers building trust and sustainability for CCAM*), coordinated and presented by Vasilis Sourlas from ICCS, ended already in December 2025. The project defined CCAM use cases to identify connectivity and cooperation needs as well as performance requirements. Reliable low-latency PDI solutions have been designed and demonstrated, which are scalable and enable trustworthy, infrastructure-based perception and decision making. The project showed that these PDI solutions deliver measurable safety improvements for VRUs and mixed traffic, while also benefiting traffic efficiency and emergency response. Specifically, it has been shown that an MEC-based Digital Twin enables the extension of Operating Design Domains (ODD) of Cooperative Automated Vehicles (CAV) through trustworthy communication, while at the same time a cloud-based Digital Twin enables traffic management optimisation. CAVs have been successfully integrated into infrastructure-driven services, allowing the offloading of complex CAV functions to MEC via the developed PoDIUM architecture. The project had an early-adoption focus, showing highest impact and market readiness in safety-critical environments like intersections, tunnels and emergency management.

The second presented project, **Augmented CCAM** (*Augmenting and Evaluating the Physical and Digital Infrastructure for CCAM deployment*), is ending in March 2026. The presentation done by Thierry Goger from FEHRL highlighted the need for infrastructure harmonisation. Therefore, harmonising classification levels have been defined and priority requirements for large-scale automated mobility deployment have been identified. Infrastructure planning and support tools have been set up and are available online. The project utilised a technology-agnostic framework and evaluated eleven PDI support solutions across seven test sites in France, Latvia, and Spain, ranging from urban "living labs" to virtual digital twin simulations. By leveraging AI, Big Data and crowdsourced HD maps, the effects of infrastructure on functional safety, environmental footprint, and socioeconomic costs to provide policy recommendations and investment roadmaps have been evaluated. The project showed that PDI support successfully enhanced the CAVs' perception of the Region of Interest by 37% and 62.5% for specific VRU use cases, and improved the anticipation detection time for VRUs. By this, PDI is able to improve the safety margin between vehicle and VRU. In relation to emergency vehicles, a developed signal priority functionality enhanced their speed, effectively reducing travel times. In all investigated use cases, all involved participants, including automated and non-automated vehicles' drivers/passengers as well as VRUs, reported an increase of perceived safety and system acceptability when PDI was involved.

The third project, **iEXODDUS** (*Infrastructure for the EXtension of ODDs – applied in connected and aUtomated driving and Standardization procedures*) presented by Selim Solmaz from Virtual Vehicle, is currently four months before mid-term. The goal of the project is to push the limits of ODDs by PDI, specifically focusing on the safe operation in challenging scenarios such as roadworks, incidents, tunnels or GNSS-denied urban areas. The project extensively collects multi-sensor and V2X data from public roads and test tracks to validate perception and decision-making. In the project, connectivity is seen as safety booster. Combined with PDI measures for localisation and planning, robust solutions are found, which are tested and validated. In a first phase of the project, 377 relevant legal and standards documents have been analysed. Based on them, standardisation proposals for digital twins, motorways and connectivity are formalised and will be released.

The fourth and last project of the session, **FRODDO** (*Federated cybeRphysical infrastructure for ODD cOntinuity*), was presented by Nikolaos Tsampieris from ERTICO-ITS Europe. This project is aiming to leverage AI, advanced sensing and federated digital twins to develop a resilient framework for automated driving, focusing on secure V2X communication and adaptable and scalable ODDs. The project validates its solutions through specialized pilots, including multi-modal interfaces in Ljubljana, AI traffic management in Athens, virtual mirror technology in Modena, and autonomous tow trucks at the TOFAS facility. By uniting European research and industry leaders, the project aims to create human-centric, scalable transportation that improves road safety, optimises traffic flow and reduces

environmental emissions. The long-term goals of the project include the development of guidelines for fail-safe ODDs as well as to deliver a ”CCAM advanced cooperation pathway”, which is able to influence European policies and standards.

Conclusion

The session’s presentations and the following discussion summarised the current state of PDI developments. The usefulness of PDI support has been shown, specifically in challenging environments such as tunnels and road works, but also in light of emergency services. An important prerequisite for PDI support is the assurance of trustworthiness, and the availability of business models so that PDI support is enabled and scaling up. It has been discussed if the availability of PDI (or components such as digital twins) should be a mandatory requirement, although this needs to be discussed more closely with stakeholders and specifically OEMs. Further research is required, as well as an alignment to other initiatives from NAPCORE, ACEA and the Safety Related Traffic Information Ecosystem.

Parallel session 31:
Software-Defined Vehicles

TWINLOOP | CODE4EV | HAL4SDV Systems Safety Security Software

SUMMARY BY JEAN-BAPTISTE BURTSCHER (VALEO)

Introduction

The European Commission, under the framework of the 2Zero Partnership and the Chips Joint Undertaking (JU), convened in Brussels for the 2026 RTR Conference. A central focus of the 16th February afternoon was the transition towards Software Defined Vehicles (SDVs): a paradigm shift, decoupling hardware from software to foster agility, energy efficiency and reinforcing European industrial sovereignty.
At the core of this transition is the question of open-source implementation and the structuring of an interoperability framework. Through collaborative funding, the European Union is accelerating the development of standardized APIs and shared architectures to ensure Europe remains a global leader in the automotive sector.

Co-moderated by Stefan Bogensberger (EC DG CNECT) and Jean-Baptiste Burtscher (Valeo), the session addressed a critical shift in the industry's business model, emphasizing open-source disposition as a primary driver for redefinition. As hardware becomes increasingly "abstracted," value creation is migrating toward software ecosystems and "as a service" models.

Projects

Three projects were presented during the session:

The **TWIN-LOOP project** (*TwinOps and vehicle specific Digital Twin for Software Defined EVs*) was introduced by Stefano PERSI from Mosaic Factor. The main objective of the project is to develop an open framework for energy efficient Digital Twins (DT). Following an Open Source Approach, it is providing the tools to create DTs and specific terminology to the wider ecosystem.

Interoperability plays a critical role, as moving from multiple isolated twins to a single DT, serving various vehicle functions across the cloud and the vehicle, is essential to be successful.

The **CODE4EV project** (*Collaborative Development Framework for Electric Software-defined Vehicles*) was presented by Valentin IVANOV, from the Technische Universität Ilmenau. The project follows a twin objective of reducing the "time to market" by 30% and integration efforts by 30% through AI based functionalities. To ensure that the framework is applicable across segments, from e-bikes to heavy duty EVs, via a shared development ecosystem, the project puts an emphasize on scalability. Utilizing trustworthy, open design tools could be a competitive edge to counter rapid development cycles seen in competing markets, specifically China.

The last project in the session was introduced by Andreas Eckel from TTTech Computertechnik. The **HAL4SDV project** (*Vehicle Hardware abstraction for integrating vehicles into smart cities, intelligent highways, and cyberspace*) is the only Chips-JU project invited in the RTR Conference 2026. It aims at creating a unified abstraction layer to make complex technology "invisible" to the end user. With forty-nine partners working on a Federated Building Block repository, utilising a modular, preferably open-source implementation, it is supporting non-safety relevant open--source development (non-differentiating) to build a common base, while allowing for IP based development for safety relevant differentiation.

Summary

The session concluded with an analysis of the shifting automotive landscape and the definition of SDVs:

- Business model transformation: The industry is moving toward a model resembling the aerospace sector where hardware remains stable while software is updated permanently. The rise of fleet operators and car rental models will prioritise a hyper-personalised approach with a "pay per feature" system.
- SME opportunities: While SDV development is resource intensive, an open-source approach allows small volume manufacturers to leverage shared platforms and cloud-based functions, preventing them from being sidelined by larger competitors.
- Infrastructure and telecoms: A major challenge remains the "edging" of vehicles and infrastructure. Interoperability is essential to achieve seamless communication at a low cost, ensuring European vehicles remain competitive without sacrificing safety.
- Ensuring discoverability through interoperability: A major priority is ensuring research and development outcomes remain useful for future iterations. This involves easing the discoverability of new findings via the federate building block

repository and establishing meaningful mechanisms for open-source contribution. Such an integrated approach is vital for increasing development speed while effectively addressing Chinese competition.

Parallel session 32:
Smart and flexible charging of EVs

SUMMARY BY CHRISTOF SCHERNUS (FEV EUROPE)

Introduction

All four presentations in this session covered projects related to the 2021 call of the 2Zero Partnership, HORIZON-CL5-2021-D5-01-03 "System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions[1]". According to the expected outcomes, the projects dealt with development and demonstration of smart and bidirectional charging, with its impact on vehicles and grids, and user expectations and behaviour related to these ways of charging.

Projects

The first presentation, by Josh Eichman of IREC, introduced the **FLOW project** working on "*Flexible energy systems Leveraging the Optimal integration of EVs deployment Wave*". FLOW realised two testbeds (in Prague and Dublin) and three demonstrations in public spaces (in Menorca and Rome) and one in a private space (in Denmark). Users used to complain about charging stations blocked by cars way after reaching full charge raising the need to keep searching for available charging stations. In response, a reservation system was introduced and tested in Dublin that improved both the availability of charging pints by cars freeing-up the site after charging and the information to users that their charging point was free to access. Aggregation of assets was successfully demonstrated on Menorca and in Rome, where the collected assets could provide the grid operator with up to 100 kW of control power. And Copenhagen tested an emission-oriented V2G system cutting CO_2 emissions and reducing curtailment of PV.

[1] HORIZON-CL5-2021-D5-01-03 - System approach to achieve optimised Smart EV Charging and V2G flexibility in mass-deployment conditions

Hugo Morais from INESC-ID reported the progress of the **EV4EU project** (*Electric Vehicles Management for carbon neutrality in Europe*).
The four demonstration sites were located in Denmark: demonstrating autonomous control of charging in public parking lots; in Slovenia, where the local DSO provides flexibility services and will continue the project going into business with supporting the Slovenian power system with bidirectional charging; in Greece, bidirectional charging was demonstrated with two vehicles; and the demonstration in Portugal involved the Azores islands. Software solutions include an open-source platform and, while TRL7-8 was requested by the call, some solutions reached at TRL9 by the end of the project. However, some research needs newly identified and addressed during the project reached Major challenges identified in the project included the uncertainty introduced by human mis-behaviour, e..g. blocking charging station, and problems with interoperability because of different communication protocols, because charging equipment manufacturers implemented the ISO 15118-20 standard in different ways that turned out to be inoperable.

In the third presentation, Baerte de Brey, ELAAD, described the **project SCALE** (*Smart Charging ALignment for Europe*). The SCALE consortium interviewed representatives of 37 cities in 16 countries about their implementation plans and tested, among others, interoperability of smart and bidirectional charging in 13 use cases with 20+ different charging concepts and in six different countries.
For example, integration of vehicles to parking garage (V2P), to home (V2H), and to building (V2B) were demonstrated. The project had to manage the bankruptcy of one German OEM. The consortium represented a very complex and complete stakeholder coverage from power generation over distribution and charging infrastructure, part of which was planned and installed during the projects, charging service operators and, last but not least, end users. The project identified the need for a regulatory framework to harmonise V1G and V2G charging throughout Europe, in terms of interoperability and financing. Also, exchanging data between grid operators and vehicles is challenging, as you encounter many different protocols, data formats and frequencies of information exchange. Energy service suppliers (i.e. vehicle users) and aggregators struggle to find a fair and competitive pricing that enables a business model for both parties. Some of SCALE's conclusions were that a fleet of Renault R5e has a very positive effect on the grid, and that the AFIR regulation must update the requirements to adopt ISO 15118-20 replacing previous versions of the standard. While DC bidirectional charging is widely achieved, we see now bidirectional AC charging entering the market.

Finally, **XL-Connect** (*Large scale system approach for advanced charging solutions Digital twins for upscaling evaluation and impact assessment*) was presented by Alois Steiner, Virtual Vehicle. The project investigated the users' inclination towards bidirectional charging and how to incentivise their service to the energy grid. While smart charging is almost uniformly accepted, still a large part was positive about V2H. But when it comes to

V2G integration, many users had concerns about premature battery ageing and considered the offered compensation insufficient for the battery's degradation. In any case, guaranteeing a minimum SOC anytime is inevitable to convince users to V2G. The V2G use case for electricity trading in BMW demonstrated a daily energy transfer of the vehicle battery equivalent to 200-300 km driving. In V2G mode, the vehicle provided a significant relief to the low-voltage grid, like other projects confirm from their investigations.

Conclusion

The **Q&A session** underpinned that the standards for smart and bidirectional charging are existing, however, they are implemented in different ways. This needs further harmonisation and detailing of standards. Tariffs must support the roll-out of V2G. It was also discussed that V2G scale-up could be supported by bonus-malus system, e.g., provide bonuses for V2G readiness and higher pricing for on-demand charging.
The audience was interested in how users could be informed and convinced to participate in smart and V2G charging, they were referred to public reports of the projects. This had also been discussed in previous presentations at RTR2024 and RTR2025. Previous presentations also had shown that to a certain degree, cycling batteries at small C-rates and small amplitudes of SoC tended to extend battery life.
Business models can improve through the rollout of bidirectional AC-charging, because it requires much lower investment.
It was emphasised that the value of grid-integrated vehicles is evident, even though the grid situation across Europe, e.g., comparing Portugal to The Netherlands, is very different. Beyond the scope of the projects presented in this session, deploying V2G to HDV was discussed in depots and motorway parking lots. Its value surely depends on the use case, because the way of charging for HDV is very different from cars. It includes destination charging, opportunity charging, depot, overnight etc. In any case, peak shaving and smart charging are a must for a fleet manager.

Plenary Session:
From Research to Market: How to bridge the gap?

Enric Aramburu
Applus+IDIADA

Arwed Schmidt
Easy Mile

Laurence Bechon
Software Republic
Renault Group

Mark Nicklas
European Commission
DG GROW

SUMMARY BY SIMON EDWARDS (RTR CONFERENCE CHAIR)

Introduction

The road mobility sector is undergoing a rapid transformation, driven by technological advancements and the urgent need for sustainable, innovative solutions. Whilst the EU is investing significantly in R&I, bridging the gap from the research arena to the market, is still a challenge, one that is often taking too long in Europe compared to international competition.
This plenary session was a chance to discover how R&I project results can make a difference on our roads. The panel of experts shared the challenges they overcame as well as insights and practical strategies for enhancing the market uptake of R&I results.

The panellists were (from left to right in the picture above):

- **Enric Aramburu**, Innovation Manager, Body Performance, Applus+IDIADA;
- **Arwed Schmidt**, Director of Strategic Initiatives & Managing Director, Easy Mile;
- **Laurence Bechon**, Chief Operating Officer, Software Republic, Renault Group;
- **Mark Nicklas**, Head of Unit, Automotive & Mobility Industries, European Commission, DG Industry, Single Market, Entrepreneurship and SMEs (DG GROW)

The session was moderated by Simon Edwards (RTR Conference Chair).

Panel Discussion

Each of the speakers gave a brief introductory remark in relation to initial questions from the Chair.

Mark Niklas was asked about "*What support is and will be available from the EC to help bridge the gap?*". He started from a big picture perspective, noting the Competitiveness Compass, published a year ago, that was being discussed in Brussels that very week, and highlighting the Draghi report on the future of competitiveness in Europe, where closing the innovation gap was the first and foremost action prescribed.
Mark confirmed that there is great research in Europe, plenty of patents generated but that we are not good in translating research into commercial products nor scaling-up businesses: hence, that is the focus of the Competitive Compass.
He considered the automotive industry as a bit of a paradox, since there more is being invested in R&D in Europe than in America and China combined, but the perception is that the European industry is not world leading, that is that the gap is not being bridged. He realised that the technologies have changed but felt that ideas are taking longer to reach the market in Europe compared to, e.g., China. Hence, innovation has been placed at the centre of the Automotive Action Plan, with funding in Horizon Europe to build industrial capabilities, e.g. in batteries and the regulatory actives preparing the ground for CCAM products.
Furthermore, to bridge the gap, the funding framework is to be changed: for the next MAFF, there will be a European Competitiveness Fund proposed, that should make the journey from idea to the market seamless.

Enric Aramburu was asked about the UPSCALE project and what evidence that could bring to bridging the gap. Enric explained a little about the history of AI and the project, which was a few years ago but it is only now that the results are finding implementation. The project was about AI for engineering, about "physics AI", which is now the "new frontier" (after audio, visual and language AI). The project was about AI and CAE, it was successful but failed to find initial application. Only once a blank sheet of paper approach to the engineering process was made, could the techniques start to find application in OEM and Tier 1 developments, leveraging many of the secondary tools that UPSCALE devised.

Arwed Schmidt was asked about the example of the AWARD project. He noted that in this project ran to 2024, looking at autonomous vehicle activities in freight logistics centres, e.g. ports, and the effects of weather conditions on the sensors used and data therefrom. Based upon the results of that project, his company's strategy changed, the company structure was rearranged. Also, the way that the company looked at the market, its approach to customers around the world was changed. He gave three examples to illustrate these changes, about how EasyMile changed from doing turnkey solutions, which could be considered analogous to the output of an R&I project (with a vehicle demonstration as its primary result), to specialising in different areas of software and hardware, being sold, for example, in the market as licenced products. Hence, he stressed the importance of focussing on the right medium-term scalable use cases, partnerships

with the right vehicle manufacturers, changing from a perspective of "autonomy everywhere" to "autonomy exactly where profitability can be realistically reached".

Laurence Bechon was asked about her perspective based on her involvement in the Vision4Rescue project. She started by explaining what the Software Republic is: a young organisation created in 2021 to address aspects related to the high rate of change and competition in the industry, where six organisations from different domains have come together to tackle new challenges, make a difference whilst retaining sovereignty, safety and trust, working from ideation to industrialisation, with a very horizontal structure, the right legal structure, business model etc.
The idea behind Vision4Rescue was to propose new solutions to the emergency services, working closely with the firefighters in France to understand what they need in the field to enhance their activity, to save time and lives. Hence, there was a vehicle from Renault, connectivity from Orange, a drone platform management from Tales, and simulation software to predict how to manage a crisis with DASO system tools and an ATOS technology. All that was brought together in a concept in about nine months, and that is going to the market during the year.
Laurence also mentioned the importance of CEO support, since he asked the organisation to "dream of something involving flying". Whilst flight is a highly regulated domain, the team thought around the topic and was able to bring something really helpful to market which still "met the dream".

The discussion moved on, with Simon noting that "*reaching the market with a viable product or solution is a challenge*", hence asking "*what support was missed or needed to scale-up the innovations?*".

Arwed answered that it is important to "get out of the echo chambers", avoid always hearing the same messages in repeating meetings, but rather to "focus, focus and focus". Further, whilst autonomous public transport in cities and the countryside is a dream, it is not affordable at the moment. The financing and the metrics for success need to be revisited. With airports this seems possible, globally, so autonomy is closer to profitability there.

Mark came into the discussion considering some general elements before responding to Arwed's comments specifically. From the Competitiveness Compass, he noted that it is necessary to remove the obstacles for innovative companies to start-up and to scale-up through financial support. Hence, the conditions need to be improved for innovative companies to grow, particularly across borders. Hence, synergies between the funding instruments need to be increased, e.g. between the EIC, the EIB, the capital markets, venture capital, within a single market. Further, access to technology infrastructures for innovation and scale-up need to be improved, simplified, hence the European Innovation

Act. Finally, some further regulatory standardisation across the Member States and cities in some cases, e.g. automated public transport, can help.

The discussion moved back to technology, how much bringing new tools and techniques into the development process helps with scaling-up. **Enric** noted that there are many new tools, but the question is what the end customer gets as a consequence of these: here, the perspective needs to be changed - bringing AI supported development tools onto the desks of OEM and Supplier engineers really makes the decision-making process in development quicker, so the end user sees new products sooner. Yet he also noted that, since these are global companies, the benefits are being seen globally, not just in Europe. **Arwed** came in with observations related to autonomous vehicles, where the application of the technology in Europe, as a consequence of European policy related to safety etc., has been lower and the costs to reach the market (even with government funding), because of validation requirements, are so much higher. He stressed the need for regulation to be enabling rather than staunching.

The question was raised then about how the Vision4Rescue could get to market so soon. **Laurence** noted that spending time with the end customer is important to identify a common goal and architecture. Then being agile to reach an aggressively timed target, which forces the technology decisions and innovation to happen, is needed.
Mark came back to the example of the automation because this is an area where obstacles are plenty and test beds needed, so as to have the regulations ready for the approval of driverless vehicles. Plenty of regulations, technical regulations need to change for that, but everything should be ready this year. However, exactly when these vehicles will be on the roads is a different story because the national liability rules and road traffic rules are so various across the EU: these obstacles need to be removed. For automated vehicles, the EC are preparing large-scale test beds since it will take a long time until all MS will have updated national rules, yet, in the meantime at least, some cross-border corridors should be available.
Arwed agreed, giving some data from his experience about the obstacles and timelines, noting that entrepreneurial thinking is needed in all areas to bring Europe back on track.

Enric was asked about whether an open approach can be ensured when making tool developments. He noted that the choice of developing software, making it open or closed, is a key decision. Allowing open source really accelerates everything, for example Nvidia is developing this kind of physics AI. However, you need a knowledge layer on top of the open source, to enable monetisation of the processes. Otherwise, new services need to be used to generate profit.

The conversation moved on and **Laurence** was asked “Can you give any pointers to the audience or to the panel here as well about what you think matters most, the right environment or the right funding? Is it one or the other or is it both that helps you succeed,

helps you bridge the gap?". She agreed that it was a combination of both that brought success and continues to do so, in different ratios, today. Having the right mindset and the right actors are both important, which is how it works in the Software Republic. Acknowledging the need to get to market soon is important for a start-up, whilst having the industrialisation realised to retain continuity, are both important for any future programme.

Mark was asked "What else can we do to get the right enabling conditions in Europe to move more rapidly between research to innovation and to the marketplace?". He noted that enabling conditions are the framework, but that whilst a lot has been prepared to improve the conditions for innovation it takes time until that takes effect. Particularly compared to China, which is moving at a different speed, but from a different basis without some of the complexity that Europe has. For example, it's a different situation for a start-up, as you have the European Innovation Council, which is much more about pitching to investors; so, it is also the mindset as well as the enabling conditions that is important.

Arwed raised the point, that was positively acknowledged by the audience, that often the calls for R&I in Europe are too broad: whilst there is a need for transparency and compliance, the call often asks for too much, at best supplementary information and studies, and does not focus on the technical requirements. Consequently, the project proposals responding to the calls include a lot of "overhead" efforts, which go beyond what is needed to bring an idea to and test it in the market.

As a final question, Simon asked each of the panellist "*What would you recommend in terms of what's the absolute essential thing that our audience of researchers and innovators here, need to do to bridge this gap from the research results through to the market?*"

Enric noted the key question is understanding well the needs, the needs of the final customer and then addressing those needs from the very beginning. That is the key thing to focus on.

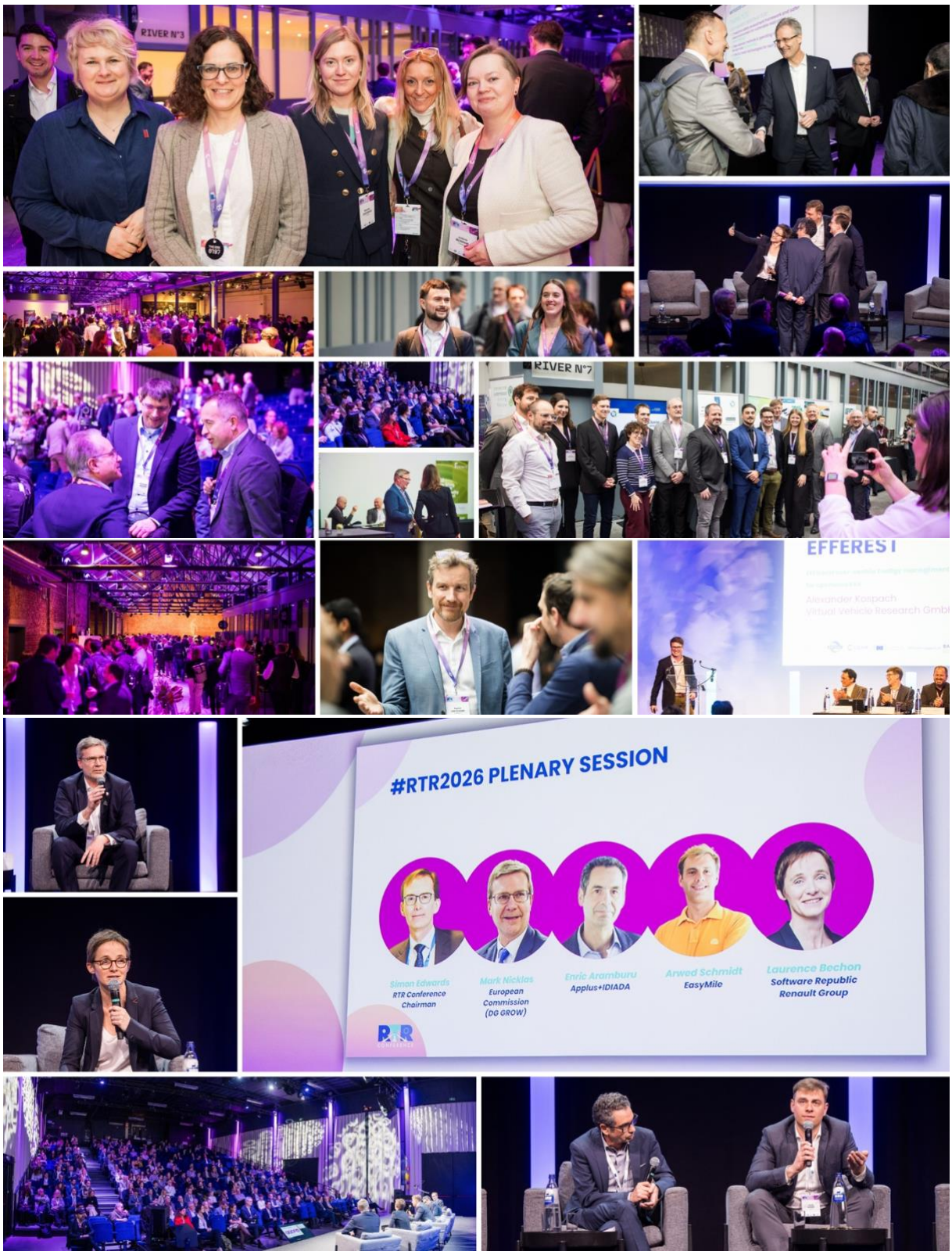
Arwed had several points for this question. "No beauty talks anymore, take a realistic look into today's market for AV". Secondly, "only make projects when the
OD is mature enough". Thirdly, "ask if it really makes sense to continue the project" and have a quality gating system to present the project to a non-biased investment board to the European Commission directly. Lastly, actually bring the smart minds together, those that have the competence.

Laurence, liked the comment about pitching the innovation, as if you were an entrepreneur, start with this mindset and that way to the market might come earlier. But

globally, do not forget to mix technical readiness with market readiness and, finally, to build the bridges with the application world from now.

Mark had the last word. He noted that the panel had full consensus and, to the innovators, he recommended also to think about the market: who are the users? Who would be willing to pay for the innovation? That's how you build a business case.

Simon, in closing the session, thanked all and noted that this had been a stimulating discussion, covering many aspects of and giving input to the bridge building we need to be doing in Europe right now to go from R&I to market impact.


#RTR2026 PLENARY SESSION
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