European Common Evaluation Methodology (EU-CEM) for Connected, Cooperative, and Automated Mobility (CCAM)

Executive Summary

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The European Common Evaluation Methodology (EU-CEM) for Connected, Cooperative, and Automated Mobility (CCAM) is written for professionals planning and conducting evaluations for CCAM projects, as well as for project coordinators and proposal evaluators. EU-CEM provides guidance for establishing a solid foundation for successful evaluation already in the project preparation phase with an evaluation plan that is feasible to execute. The objective is to ensure high-quality evaluations that provide reliable input for decision- and policymaking in both the public and private sectors.

The EU-CEM Handbook aims to provide guidelines and best practices for planning and conducting CCAM evaluations, particularly impact assessments. EU-CEM can be applied in three types of activities: (1) ex-ante impact assessments, where it can help to prepare for CCAM deployment and uptake, or to identify unintended outcomes that may require mitigation; (2) ex-post evaluations, to assess the impacts of already implemented CCAM systems; and (3) the design and deployment initiatives of CCAM systems, with an aim to maximise societal benefits. The EU-CEM Handbook provides guidelines for three different phases of a project: Proposal writing, the starting phase, and the ending phase. It is important to recognise that this handbook is not a substitute for expertise.

CCAM can have impacts on the level of (1) single vehicles and (2) humans, on (3) the transport system, and on (4) the society overall. This handbook covers all four levels of evaluation, totalling 18 evaluation and impact areas. To be applicable for different CCAM evaluations, EU-CEM leaves room for projects to adapt it according to their specific scope and needs.

Chapter 1 ‘Introduction’ of the EU-CEM Handbook provides the background and scope for EU-CEM. In scope of the methodology is higher automation in road transport of people and goods. To claim compliance with EU-CEM, the project must meet certain minimum requirements, such as including impact assessment activities, preparing an evaluation plan, and providing an explanation if any guideline in the EU-CEM Handbook could not be followed.

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Chapter 2 ‘Guidelines for the project preparation phase’ of the EU-CEM Handbook focuses on the essential steps for preparing the evaluation in a CCAM project, particularly during the proposal preparation phase and the beginning of the project. The guidelines emphasise the importance of scoping the evaluation to ensure that the commitments made in the proposal can be executed effectively. This involves understanding the overall project goal and the state of the art of CCAM, and being realistic about what can be tested within the project.

The chapter also highlights the need for a well-organised project structure and governance to manage the complexities of large, multi-partner projects. This includes defining clear roles and responsibilities, ensuring effective communication, and setting up processes for conflict resolution. The guidelines stress the importance of collaboration between the evaluation, technical, and test site teams to ensure alignment and successful project outcomes.

Chapter 3 ‘Guidelines for developing an evaluation plan’ provides detailed guidelines for developing an evaluation plan in CCAM projects. The process begins with a clear description of the CCAM system under evaluation, including its operational design domain and service concept. This is followed by formulating specific, answerable, and relevant research questions that align with the evaluation scope and project objectives.

The chapter emphasises the need for setting up an iterative process of refining research questions, evaluating their feasibility, and prioritising them based on relevance, importance, and resource availability. It also covers the selection of appropriate evaluation methods, data specification, and experimental design. The goal is to ensure that the evaluation plan is feasible, realistic, and capable of providing reliable input for decision-making.

Chapter 4 ‘Evaluation-area-specific guidelines’ of the EU-CEM Handbook supplements Chapter 3. Chapter 4 is divided into four main evaluation levels, each containing several impact areas:

- Vehicle Level: This section focuses on the technical functioning and driving behaviour of CCAM systems. It includes guidelines for assessing software and hardware functionalities, performance, cyber-security, and reliability. Driving behaviour evaluation covers the vehicle's dynamics, the vehicle’s interactions with the environment and other road users.
- Human Level: This section addresses interaction of people with CCAM systems, including user opinions, expectations, and awareness. It also covers people mobility, examining the effects on availability, access, quality, suitability, and affordability of mobility options. Additionally, it includes quality of life, considering individuals' physical, mental, social, and financial well-being.
- Transport System Level: This section addresses impacts of CCAM on the broader transport system, including services and operation, logistics, transport activity and fleet composition, traffic safety, traffic flow efficiency, energy and environment, and accessibility. It provides guidelines for assessing the impacts of CCAM on business models, logistics processes, total amount of travel and transport, number of accidents, collective traffic patterns, emissions, the potential to reach destinations, and so on.
- Society Level: This section covers the societal impacts of CCAM on land use, liveability, economic activity and employment, socio-economics, equity, and sustainability. It provides guidelines for assessing the spatial and functional implications of CCAM, the quality of living

in studied areas, economic development, societal outcomes, and the fairness and inclusivity of CCAM impacts, and the sustainability perspective of different impacts.

Chapter 5 ‘Guidelines for reporting evaluation outcomes and EU-CEM feedback’ covers the reporting of the evaluation and impact assessment in CCAM projects. Reporting should be seen as an opportunity to reflect on the entire evaluation cycle, document lessons learned, and share insights with the different stakeholders. Requirements for reporting the evaluation methodology and its outcomes can vary depending on the study commissioner.

In conclusion, the EU-CEM Handbook provides a comprehensive framework for planning and conducting high-quality evaluations in CCAM projects. By offering detailed guidelines for various phases of a project and covering multiple evaluation levels, EU-CEM ensures that evaluations are well-coordinated, feasible, and impactful. The use of EU-CEM not only supports the preparation and execution of evaluation for CCAM projects, but it can also maximise societal benefits of CCAM and improve the usefulness of the evaluation results for decision-making in both public and private sectors.

The first complete version of the EU-CEM Handbook was published in 2025. The methodology is planned to evolve over time, incorporating new learnings and experiences. The next update is expected in 2028.