EUCAR PERSPECTIVE ON DIGITALISATION OF ROAD TRANSPORT

INTRODUCTION

EUCAR is fully committed to achieving safer, cleaner, smarter and more efficient transport solutions. Digitalisation of Road Transport and its technologies will play a vital role in it:

- **Supporting the Vision Zero targets set for 2050 by decreasing the number of road fatalities and accidents.**
- **Further reducing transport emissions and congestion, while ensuring inclusive mobility in particular for the elderly and people with disabilities.**
- **Enabling new mobility concepts shifting design and development from driver-centred to mobility-user-centred.**

The innovations through the Digitalisation of Road Transport will have a remarkable economic impact ensuring jobs and growth. We drive the development of technologies, functions and services, ensuring safety and mobility for all road users while strengthening the global competitiveness of the automotive industry.

KEY STATEMENTS

Connectivity, Data and Automated Driving

⇒ **Mobility is crossing a new – digital – frontier, connecting vehicles to users, road infrastructure and the web in general. Thus, connectivity, data and automation are key elements driving the Digitalisation of Road Transport.**

- Digitalisation of Road Transport technologies and new business models involve producing and communicating huge sets of data. Secure and trustful communication inside the vehicle, between vehicles and other road users, and the infrastructure is essential. In this context, interoperability (EU/globally) is key.
- Security forms an essential pillar for connectivity and data sharing. Efficient security solutions are necessary to ensure scalability. We develop systems and functions that use safe, secure and trusted communication and protect users' privacy.
- For automated driving, as well as a number of automated manoeuvres, current vehicle technologies already provide advanced assistance functions, relying on sensing and data fusion processing enabling a 360° traffic situational awareness. Further advancing technologies will enable vehicle control for longer time periods towards highly automated driving. The vehicles will also leverage connectivity and data sharing in complex traffic environments to extend the operational design domain (ODD) for Automated Driving functions.
- In the future, we expect a mix of connected, automated and conventional traffic for a long time. We work with all stakeholders to ensure the smooth and safe coexistence of all other road users.

Safety

⇒ **Achieving the Vision Zero targets and further decreasing fatalities and injuries in road transport is becoming more and more challenging. Safe road transport is a key priority and digitalisation offers additional possibilities to improve it. We address increasing safety in all technology development stages and operations.**

- The accident statistics over the past 10 years show that further reducing accidents is becoming more challenging. A more systemic approach covering vehicles, infrastructure and road users is needed to achieve Vision Zero. Consistent methods and assessment tools are required to fully understand the safety impact of further digitalisation of road transport and derive safety requirements. We increase knowledge and data collection on accident causation and improve risk mitigation.
- We develop systems that minimize risks by first aiming at avoiding a collision and second reducing the consequences of accidents. We develop specific methods, design guidelines, real-world and virtual testing techniques to test, validate and verify all functions.
- As vehicles with different levels of automated driving enter the fleet, the accident statistics will change. While we expect the overall number to decrease, addressing new types of accidents is important, e.g. seating positions in automated driving may change.
- For all vehicles (even for highly automated vehicles) human technology interaction is relevant for road safety. This includes the driver (and the driving task), and the interaction with other road users. It has to be self-explanatory, intuitive and inclusive for all road actors (e.g. vulnerable road users).
- We analyse all safety-critical human-technology interactions, e.g. driver disengagement, cognitive load in critical situations, misuse, skill degradation, trust and misinterpretation to develop suitable counter strategies.

SDV

⇒ **Software is taking an increasingly important role in vehicle operation. Software-defined vehicles (SDV) enable new features, reshaping future mobility with increased cloud integration. It will enable cross-industries collaboration beyond current limitations with new partnerships and open ecosystems emerging.**

- ICT technologies evolve at a different pace than vehicle development and product lifecycles. By decoupling advancements in software from hardware, we accelerate innovation drastically. We address the software challenge for the EU's automotive industry and focus on an open and pre-competitive collaboration on the non-differentiating elements of the vehicle software stack.
- The software layers (e.g., operating system, middleware) between hardware, applications, and cloud including its interfaces play a key role in this paradigm shift. We align views and definitions with all relevant stakeholders leading to the development of standardised software building blocks, interfaces, development tools and validation toolsets.

AI

⇒ **Artificial Intelligence (AI) plays a major role in future services, and digital value chains not only in connected and automated driving but also in intelligent mobility services. Strengthening European Industries in developing and integrating AI technologies is a geopolitical necessity to avoid future strategic dependencies.**

- Europe needs a functioning ecosystem for AI development and integration. Implementing AI in automotive products, in particular in automated driving, presents a variety of challenges, e.g. industrialisation, requirement-based development, and continuous improvement of trained modules for application in safety-critical domains. Technological uptake of AI depends on societal trust, especially where there are many misconceptions and much misinformation about AI. We work on AI as a functional competitive and affordable technology.
- Enabling safe autonomous driving in a more complex and dense traffic environment needs specific automotive requirements such as reliability, robustness, safety, security and real-time functionality. We develop verification and validation methods for AI in automotive applications, especially when used to control the vehicle.
- In vehicle design, development, material research, integration of AI, machine learning and big data methodologies accelerate innovation cycles, and facilitate the search for suitable replacements for critical materials.

Economic Impact

⇒ **Connectivity, data, AI, automated driving, and SDV will have a remarkable economic impact. Advancing these technologies is a decisive factor for the future viability of vehicle manufacturers and the entire value chain. Global competition between Europe, the US and Asia for leading the Digitalisation of Road Transport is high.**

- The leader of this “innovation race” depends on user adoption and social acceptance. Genuine user adoption will be the key enabler for large-scale deployment that will alter the mobility landscape.
- Society´s acceptance of connected and automated driving is crucial to ensure the uptake of innovation. This depends on two key elements: trust in technology and added value. We translate technical complexity to humans to create trust and social acceptance. We conduct extensive public awareness campaigns and education by demonstrating at a large scale the safety and functioning of the system.

EUCAR is committed to evolving from driver-centred to mobility-user-centred design and development. We invite all stakeholders to collaborate and pave the way for European interoperability and economies of scale in the Digitalisation of Road Transport.

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EUROPEAN COUNCIL FOR AUTOMOTIVE R&D

ABOUT EUCAR

EUCAR (European Council for Automotive R&D, www.eucar.be) is the association for collaborative research and innovation of the major automobile manufacturers in Europe. These manufacturers contribute to sustainable mobility and a competitive European industry, investing more than €62bn per year in research and development. The industry’s investments are leveraged by the collaborative work performed with the support of the European Framework Programmes, currently Horizon Europe. The EUCAR Council comprises the heads of research and advanced development of the member companies