

EARPA Position Paper

'Saving Thousands of Lives on European Roads'

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About EARPA

Founded in 2002, EARPA is the association of automotive R&D organisations. It brings together the most prominent independent R&I providers in the automotive sector throughout Europe. At present its membership numbers 51, ranging from large and small commercial organisations to national institutes and universities.

Introduction to an approach for saving thousands of lives on European roads

The European Union has entered into a phase of stagnation in its efforts to protect the health and wellbeing of its citizens in road traffic. While continuous improvements in road safety had been achieved for many years, EU road fatality figures have remained nearly constant at the unacceptable level of about 26,000 deaths per year since 2013¹. The same trend is apparent for injuries with ca. 1.4 million EU citizens getting injured in road crashes each year. This is unacceptable in view of the human suffering which these figures imply and unacceptable also in view of relevant road safety targets set by the European Commission.

In its Transport White Paper adopted in 2001, the European Commission communicated the target of halving the number of fatalities on European roads by 2010². This target has not been met. The European Commission's Road Safety Programme 2011-2020 re-defined this target by calling for a further reduction of road fatalities by 50% until 2020³. With the current stagnation in fatality statistics, this target is getting out of reach, as well.

In contrast to that, the European road transport system actually needs to evolve towards Vision Zero meaning a system in which human life is the paramount concern and no-one is killed or severely injured anymore. This concept is supported by the current European Commission's Transport White Paper, which sets the goal of moving close to zero fatalities in road transport by 2050⁴. In view of the limited progress in European road safety over the last few years and earlier targets not being met, clearly intensified efforts have to be made by all relevant stakeholders not to completely miss this important goal for 2050.

Research and innovation are key factors in such efforts, and cooperative, connected and automated mobility (CCAM) shows the potential to become a key enabler for substantial reductions in collisions on European roads as well as in the numbers of injured road users and fatalities. Innovation in enabling technologies of CCAM, as described in the EARPA Position Paper on "The Role of Electronics and Communication Systems in European Road Transport and ICT", needs to be complemented by research on the safe integration of CCAM in the road transport system and by the development of new approaches to address a multitude of safety risks which will not be

¹ Road safety evolution in EU, based on CARE (EU road crash database) or national publications
https://ec.europa.eu/transport/road_safety/specialist/statistics_en

² European transport policy for 2010: time to decide, white paper, COM(2001) 370 final, Brussels, 12.09.2001

³ Towards a European road safety area: policy orientations on road safety 2011-2020, communication from the European Commission, COM(2010) 389 final, Brussels, 20.07.2010

⁴ Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, white paper, COM(2011) 144 final, Brussels, 28.03.2011

avoided by CCAM. (The latter comprising non-automated vehicles crashing into other road users, single vehicle crashes of two-wheelers, collisions with citizens refusing to be always connected to a data collecting network etc.) In the end, it is not one single measure, but the combination of innovations in all the aforementioned directions which may bring Europe closest to Vision Zero.

Key research needs

Following the approach above, EARPA fully supports the respective research topics from the Strategic Research Agenda (SRA) of the European Road Transport Research Advisory Council (ERTRAC)⁵. These topics are summarised in the chapters on Connectivity and Automation and on Safety and Security of the ERTRAC SRA, to which EARPA members have made substantial contributions. In particular, EARPA puts emphasis on the importance of the following research needs:

Key research needs

Concerning the ambition of saving thousands of lives on European roads, EARPA stresses the importance of further research and development on the following elements of the ERTRAC SRA:

1. Understanding and predictive assessment of safety risks and system effectiveness
2. Smooth interaction between all road users, their vehicles and infrastructure in a safe system approach
3. Crash safety in future scenarios of road transport

Under these three headlines, the following objectives deserve special attention:

1. Understanding and predictive assessment of safety risks and system effectiveness

- Safety assessment methods extended to the transport system level, to future scenarios and to self-learning systems
- Appropriate simulation environments for such assessment methods and realistic models of all elements of the transport system (incl. human behaviour and traffic flow)
- Methods to define when self-learning systems are sufficiently trained and how to deal with the inherent dynamics in their properties

2. Smooth interaction between all road users, their vehicles and infrastructure in a safe system approach

- Comprehensive analysis of how the road transport system will change with increased automation and how this will affect scenarios related to safety
- Solutions to avoid undesired interaction between road users, considering safety and acceptance criteria
- Human-technology interfaces becoming highly intuitive and adaptive to user needs

3. Crash safety in future scenarios of road transport

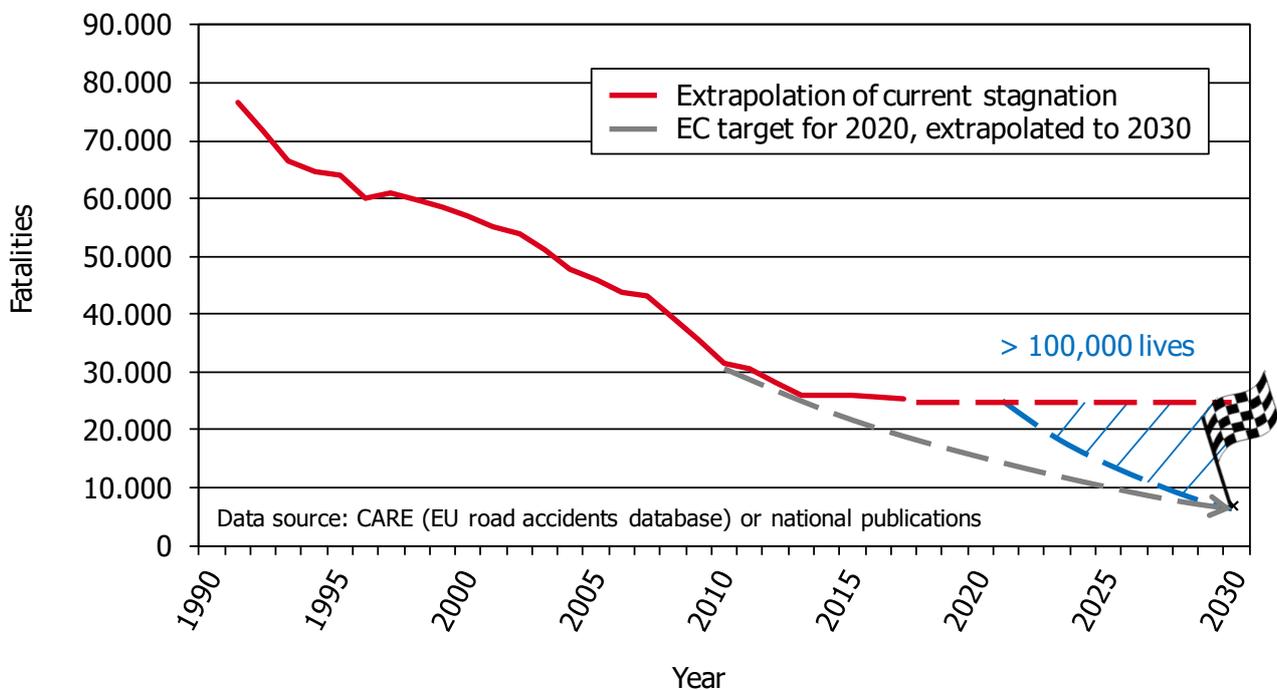
- Virtual human body models with improved biofidelity and new biomechanically based injury criteria, incl. the adaptation of such models to evaluate personal protection devices and forgiving road infrastructure for vulnerable road users
- Light, affordable and crashworthy vehicle body structures
- Appropriate crash safety systems for fully automated vehicles

⁵ ERTRAC Strategic Research Agenda, Input to 9th EU Framework Programme, April 2018

Expected impact

A comprehensive research and innovation programme addressing the above-mentioned key research needs is expected to enable anticipating transport governance, well-founded prioritisation of road safety measures and thus efficient investments by public and private stakeholders. It will facilitate the acceptance of automated road transport and leverage its potential in increasing road safety. More specifically, it will support the development of rating schemes and regulations for safe automated mobility on European roads and contribute to the avoidance of crashes resulting from sub-optimal system adaptation to user needs and characteristics. Even if some collisions may still occur in road traffic even by 2050, innovative mitigation measures will result in reduced human suffering from these crashes and in reduced burden for the health care system.

If it was possible then, in combination with the deployment of CCAM, to over-compensate the current stagnation in fatality figures and reduce the number of road deaths in 2030 to one fourth of the number in 2010, thousands of lives of European citizens could be saved. Actually, this extrapolation of the EC's earlier road safety targets would mean that more than 100,000 lives could be saved until 2030, if the current trend in fatality figures could be turned into a steady decrease in the coming decade (see figure below).



Saving so many lives would not only reduce human suffering and grief, but in a socio-economic perspective, would also bring about huge cost savings. According to figures from a study for the interim evaluation of the Policy Orientations on Road Safety 2011-2020⁶, saving 100,000 road deaths would mean saving costs in the order of EUR 200 billion. If also the target of halving the number of serious injuries until 2030 from the Valetta Declaration⁷ was reached by a steady decrease in the coming decade, this could be translated into a total of more than 400,000 serious injuries avoided and into additional cost savings of ca. EUR 100 billion.

With such huge potential returns, it is clear that substantial investments in the protection of the lives and health of European citizens in road traffic will be rewarding from both an ethical and an economic perspective.

⁶ Road safety study for the interim evaluation of Policy Orientations on Road Safety 2011-2020, study by Jeanne Breen Consulting for the European Commission, February 2015

⁷ Valetta Declaration on Road Safety, declaration by the transport ministers of the EU member states, Valetta, 29.03.2017

Conclusion

As much as Europe needs green vehicles, it also needs safe vehicles embedded in a safe transport system. The automation of road transport can be a key enabler in this context and contribute substantially to overcome the current stagnation in the numbers of injured road users and fatalities. With the longer-term objective of moving towards Vision Zero, a comprehensive research and innovation programme should be set up following the mission of saving more than 100,000 lives and avoiding four times as many serious injuries on the EU's roads until 2030. Some of the key research needs which should be addressed by such a programme and important objectives to pursue are mentioned above from the EARPA's experts' point of view.

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