

ON THE ROAD FOR SAFETY RESEARCH

The EU's Horizon 2020 research funding programme includes a dedicated Smart, Green and Integrated Transport Challenge, which aims to 'achieve a European transport system that is resource-efficient, climate-and-environmentally-friendly, safe and seamless for the benefit of all citizens, the economy and society'.

We talked to Maria-Cristina Marolda from DG MOVE's Unit Innovation & Research about the status of road safety research in the current programme.

Q. How does road safety research feature in the programme?

Maria-Cristina: "Safety, in all transport modes, is an essential aspect that cannot be compromised by any other technological development. For this reason the programme has a dedicated theme on safety issues. Road transport deserves particular attention due to the high number of accidents and fatalities compared to other transport modes, and to the high vulnerability of large groups of users. This aspect was the core of the Horizon 2020 2014 call 'Traffic safety analysis and integrated approach towards the safety of Vulnerable Road Users' that inspired a number of projects. A selection of these projects are described in this newsletter."

"Different groups of users have also been the focus of the 2016 call 'Behavioural aspects for safer transport' to study key factors that influence safe behaviour of transport users, both individually and collectively."

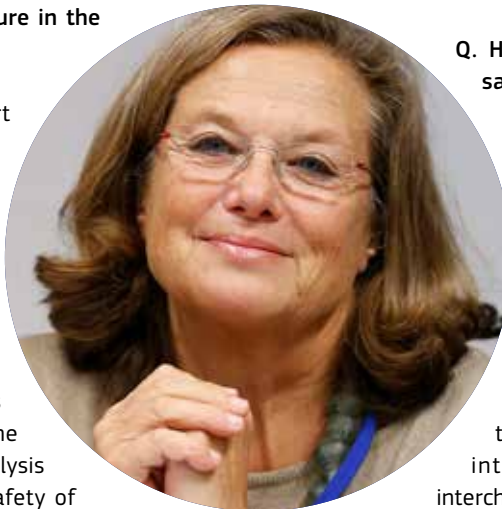
Q. How are new technologies, such as autonomous driving, likely to affect road safety in the future?

Maria-Cristina: "The emergence of new technologies for connected and automated vehicles will probably require a new definition for Vulnerable Road Users. These are traditionally identified as 'non-motorised' users, in future the connectivity level of this group will also need to be considered. New developments, although intending to increase the level of safety by removing human error, present new challenges for both passengers and other users. In 2015 the

Horizon 2020 call 'Safe and connected automation in road transport' and the 2017 call 'Protection of all road users in crashes' aim to collect new research to anticipate potential threats arising from such advanced technologies."

Q. How can research contribute to better safety on our roads?

Maria-Cristina: "All components of the road transport system have to contribute to reach the highest possible level of safety. That is why in 2016 special attention was devoted to the role of road infrastructure, and recent developments in transport connectivity and automation. The Horizon 2020 calls 'Transport infrastructure to increase the transport system safety at modal and intermodal level (including nodes and interchanges)' and 'Road infrastructure to support the transition to automation and the coexistence of conventional and automated vehicles on the same network' have received wide interest in the research community. The selected project programmes promise positive developments towards the completion of the Safety System in the new era of digitalisation and automation."



Support for decision makers on policy options

The Horizon 2020 project SafetyCube will develop an innovative road safety Decision Support System. This will help policymakers select and implement the most appropriate strategies, measures and cost-effective approaches to reduce the toll of casualties on our roads today.



At the core of the project is a comprehensive analysis of the factors that cause accidents combined with new data on the effectiveness and cost-effectiveness of safety measures, not just in relation to reduction of fatalities, but also the total number of citizens injured. The project will also set in place an operational framework to ensure authorities have access to the DSS when SafetyCube has completed its work.

Four steps to safety

The project's four-step approach begins with an identification of risk factors as a basis for selecting the most important road safety issues to tackle. Lists of risk factors will be made including ones that are relevant across Europe, such as speeding, drunk driving, use of protective equipment (seatbelts, helmets, etc.), driver error and risk factors related to the environment (darkness, bad weather, etc.), road design and maintenance issues. All the factors will be quantified and the 10-20 most important ones selected for further study.

Step two involves identifying and estimating the effects of road safety measures using a broad survey of effective and potentially effective measures. The 'potentially effective' measures refer also to concepts that have not yet been widely applied, such as Intelligent Speed Adaptation (ISA). Basic information, such as a description of the measure and a semi-quantitative estimate of safety effects and costs will be collected and assessed in terms of degree of implementation and their potential for further improving road safety. The measures will also be filtered with respect to whether their

effects are sufficiently well-known to be quantitatively estimated or not. Measures whose effects cannot be estimated will not be included in subsequent analysis.

SafetyCube's third step is to estimate the costs of implementing the road safety measures. The costs may be direct or indirect. Direct costs are the out-of-pocket payments made to implement a

Proactive systems for vulnerable users

Pedestrians accounted for 22 % of the world's road traffic deaths in 2010, while cyclists represented an additional 5 % — adding up to 335 000 deaths, according to the World Health Organization.

The EU-funded project PROSPECT seeks to provide a better understanding of accidents involving these vulnerable road users (VRUs), and to develop, demonstrate and test innovative, proactive safety systems for protecting them.

The project will use in-depth accident analysis and observation studies across a number of European countries to improve understanding of VRU-related accidents. This knowledge will be used to tailor more effective sensor processing, Human Machine Interfaces, and driver warning and vehicle control strategies that combine vehicle steering and braking for collision avoidance. In particular, PROSPECT will build on experiences gained with first-generation AEB-PED systems currently on the market.

The results will be integrated in simulators and four vehicles will be built to demonstrate the key achievements of the project and to validate the improvements. In addition, new test procedures will be proposed to the [European New Car Assessment Programme \(Euro NCAP\)](#).

www.prospect-project.eu





A toolbox to frame the causes of accidents

The InDev Horizon 2020 project will help improve the safety of Vulnerable Road Users (VRU) by developing a toolbox for understanding accident causes involving VRUs and a framework for comprehensive assessment of the socio-economic costs of these accidents.

The toolbox will combine use of accident databases, in-depth accident investigations, surrogate safety indicators, self-reported accidents and naturalistic behavioural data. The project will link accident causation factors to VRUs' accident risk and provide a solid basis for developing preventive countermeasures and a better input for socio-economic cost calculations for VRU accidents.

InDev aims to put the spotlight on the relevant factors by focusing on the processes involved as accidents develop. This examination of the 'causation chain' uses observation of critical traffic events that are similar in process to real accidents, but are more frequent and easier to collect. By using these surrogate safety indicators, the project won't need to wait for accidents to happen in order to learn how to prevent them. This solid knowledge will help to improve the safety of VRUs on our roads.

measure. Indirect costs are loss of benefit associated with a measure that influences travel demand. The project will utilise data from Government and industry stakeholders to estimate the costs of introducing and operating safety measures using a common methodological basis that will enable costs to be compared in terms of vehicle types, road environments and behaviour.

Ranking safety

The final step will be to determine how to prioritise the various road safety measures. This can be done using a variety of methods, including ranking according to the number of fatalities and serious injuries they prevent: an approach consistent with the EU's Vision Zero, an approach that foresees a future without road deaths.

Other ranking factors will also be undertaken in terms of cost-effectiveness (i.e. the number of fatalities or injuries prevented per unit of cost for implementing the measures), cost-utility (where utility

is represented by means of a scale for an individual's quality of life), net cost-effectiveness (also taking into account non-safety impacts of the measures) and net present value (the present value of benefits minus the present value of costs).

SafetyCube will consider the pros and cons of these different ranking methods and will make final recommendations on when particular approaches should be applied.

More info: www.safetycube-project.eu

Keeping older people safe on the road

European countries face great challenges due to rapidly aging population. In 2012, 17 % of Europeans were aged 65 and over. By 2020 this will have risen to 28 %.

Meanwhile, the mobility needs of the elderly are also changing. Maintaining a driver's license is important for many older citizens to retain their independence. In addition, technological developments, such as the introduction of electric-bikes, enable older people to continue to be mobile for longer.

These demographic and behavioural changes need to be better understood in the context of mobility and road safety. While accident data show a decreasing number of fatalities and serious injuries on EU roads, recent data from the European Road Safety Observatory (ERSO) shows a worrying increase in the proportion of older people in the fatality statistics. Another factor is the increasing rate of obesity in EU populations, which introduces changes in injury patterns and risks.

The main goal of the Horizon 2020 funded SENIORS project is to improve the safe mobility of the elderly, including the obese, using an integrated approach covering all main modes of transport and the specific issues of this VRU group.





SENIORS will investigate and assess how injury reduction can be achieved through innovative tools and safety systems targeting the protection of the elderly as car occupants and external road users. Improving the safety of the main modes of transport used by elderly people should impact positively on the safety of other modes such as public transportation and motorcycles.

More info: www.seniors-project.eu

XCYCLE for safety

Cyclists suffer a disproportionate share of serious injuries and fatalities on the road, but are often treated less equally than other road users by current traffic systems. The XCYCLE project is developing technologies to improve their safety. These include active and passive detections, systems that inform both drivers and cyclists of hazards at junctions, novel and effective methods of presenting information in vehicles, and on-site cooperation systems aimed to reduce collisions with cyclists.

An in-vehicle detection system and a system of threat mitigation and risk avoidance by traffic signals will be developed, as well as a demonstration bike equipped with cooperative technology. All these innovative and integrated solutions will be tested and

verified through case studies in the German city of Braunschweig and on a mobile platform.

A user-centred approach will be adopted and behavioural evaluation will part of the whole process using eye tracking data and an evaluation of human-machine interfaces. A cost-benefit analysis of behavioural changes will be translated into estimated crashes and casualties saved per system. The project ends in November 2018.

More info: www.xcycle-h2020.eu

Find out more...

If these subjects have revved up your interest, then check out the Road Safety website at: ec.europa.eu/roadsafety

Please visit [@Transport_EU](https://twitter.com/Transport_EU) twitter account for regular updates on #roadsafety" and #EUtransport

Visit these sites for inspiration and information.

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