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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

Saving Lives: Boosting Car Safety in the EU

Reporting on the monitoring and assessment of advanced vehicle safety features, their cost effectiveness and feasibility for the review of the regulations on general vehicle safety and on the protection of pedestrians and other vulnerable road users

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1. INTRODUCTION

Road safety in the EU has improved significantly over the past decades, thanks to strong and effective action taken at EU, national and local level to address road user behaviour, vehicles and infrastructure. As a result the EU roads are the safest world-wide. This increased safety can to a large extent be attributed to EU legislative requirements on safety of vehicles that have been introduced over these years as part of the EU policy on road safety[1].

These vehicle safety requirements were also a boost to European research, development and innovation: when industry was faced with more ambitious requirements it found the ways to respond with innovative technical solutions. Given that the EU was the first mover in most of these requirements, most solutions were developed in Europe and quality jobs were created here to respond to the challenges. In fact the motor vehicle industry is the main provider of private R&D in the EU, and has been setting the standards globally.

The automotive industry continues to innovate and the regulatory requirements need to be re-visited, with the aim to ensure that the EU continues to be in the fore-front of international developments, while continuing the work for saving lives. The impressive progress in the reduction of car accidents has slowed down lately, while the cost of road fatalities and injuries is estimated to be at least €100 billion a year[2] and hundreds of families continue to be shattered every year due to road accidents.

Active safety features and their technological development are leading to gradual automation of vehicles. They are considered as key enabling technologies to boost and support the wider automation of vehicles, contributing to the digitalisation of the internal market. The EU has, in the past, introduced mandatory fitting of electronic stability control systems on all vehicles and advanced emergency braking systems and lane departure warning systems on trucks and buses, which contribute to the reduction of fatal casualties in traffic by an estimated 5,000 a year. The full potential of these and further active safety technologies can only become reality with large-scale deployment in vehicles on EU roads.

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1 Ex post evaluation of the European Road Safety Action Programme (2001-2010) – http://ec.europa.eu/transport/facts-fundings/evaluations/doc/2010_road_safety.pdf, Interim evaluation of the Policy orientations on road safety 2011-2020 – http://ec.europa.eu/transport/facts-fundings/evaluations/doc/interim-road-safety-evaluation-report-final8june15.pdf

2 http://europa.eu/rapid/press-release_IP-16-863_en.htm

Several of these requirements also contributed to the reduction of CO_2 emissions and therefore to comply with the EU targets on climate action and to the objectives of the energy Union. This was the case for tyre pressure monitoring systems for passenger cars that ensured use with optimal tyre pressures to reduce the rolling resistance and therefore reduce fuel consumption. The climate action targets for reducing CO_2 in the transport sector also call for development of further vehicle technologies that incentivise driving in optimal conditions of fuel economy, e.g. through adaptive and intelligent speed adaptation and expansion of tyre pressure monitoring to commercial vehicles.

With increasing levels of vehicle autonomy being a priority for car manufacturers, accurate, robust, durable and affordable sensor technologies are becoming widely available. These are necessary to fully detect the environment around the vehicle, contributing to safety, especially regarding vulnerable road users, and to the reduction of congestion and the ensuing pollution, given that 15% of all congestion in Europe is due to accidents[3].

In this Report the European Commission presents the findings of its analysis concerning a range of new safety measures. It proposes a way forward, with due consideration of the feasibility and cost effectiveness of the proposed measures. The detailed explanation of the measures is included in the Commission Staff Working Document annexed to this Report. These are the basis for a large public debate to which the European Commission invites all stakeholders.

Finally, as a general framework the European Commission intends, with this work, to contribute to the priorities linked to growth, jobs and investment in the EU, promoting the most efficient innovations and retaining quality jobs in Europe, digitalisation of the internal market via the promotion of safety features that are considered the key enabling technologies to boost and support the wide-scale automation of vehicles as well as the Energy Union objectives of reduction of CO_2 in transport.

2. INTERPLAY BETWEEN ROAD SAFETY AND VEHICLE TECHNOLOGY

Since 2009, transport accidents are no longer the leading cause of death in the European Union[4]. The number of road fatalities in the EU has come down considerably during the last 13 years, namely with an approximate 53% reduction from 54,300 in 2001 to 25,900 in 2014[5]. However, traffic accidents still affect hundred thousands of families and lead to huge economic costs each year. As such, the problem of road safety remains an urgent one. Also, even though we have seen strong annual reductions, fatality figures appear to stagnate since 2013. Several Member States are in fact reporting that the number of casualties is on the rise again[6].

In order to reach the EU strategic target of halving the number of road deaths from approximately 31,000 in 2010 to 15,000 in 2020[6], as stated in the Policy Orientations on Road Safety 2011-2020[7], additional efforts are needed as it is entirely likely that the target is not going to be reached.

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3 http://ec.europa.eu/transport/themes/its/road/application_areas/vehicle_safety_systems_en.htm
4 http://ec.europa.eu/eurostat/statistics-explained/index.php/Causes_of_death_statistics
5 http://ec.europa.eu/transport/road_safety/pdf/observatory/trends_figures.pdf
6 http://europa.eu/rapid/press-release_IP-16-863_en.htm
7 COM(2010) 389 final

On average, a majority of 55% of road fatalities occur on non-urban roads, 38% inside urban areas, whereas only about 7% are caused on motorways. Pedestrians and bicyclists account for 30% of transport fatalities overall, but for almost 43% in urban areas[8]. These figures give a general indication of the areas of improvement that could be targeted with the revision of the General Safety and Pedestrian Safety regulations.

Experts have stated that about 95% of road accidents involve some level of human error, while it is estimated that 75% are caused by human error alone[9]. Amongst the main human factor related accident causes research has identified excessive speed, distraction and drink-driving as some of the most important aspects. In line with the Communication from the Commission CARS 2020: for a strong, competitive and sustainable European car industry[10] and the action plan outlined in in the Commission Communication "Towards a European road safety area: policy orientations on road safety 2011-2020"[11], road safety should follow an integrated approach and vehicle safety is only one out of a number of factors that determine the outcome. In order to be effective, road safety policy as a whole needs to take the full range of factors, such as driver behaviour and road infrastructure, into account and keep a close eye on their interplay.

However, given the relevance of vehicle safety requirements among these factors, and following the reporting obligations of the General Safety and Pedestrian Safety Regulations, the European Commission has started the debate on the priorities for intervention in this area and on the evidence-based measures that create a maximum of positive impact overall.

Specific attention should be given to vulnerable road users as well as vehicle occupants who present an intrinsic frailty due to their age, i.e. the elderly[12] and young children[13]. Attention should also be given to the assessment of technologies that exploit the interactions between the driver, the vehicle and the driving environment, such as Intelligent Transport Systems (ITS), contributing in this way to the digitalisation trends in the EU, in line with the Digital Single Market Strategy.

3. SAFETY DUE TO REGULATORY INTERVENTION

There are clear examples of effective safety requirements already made mandatory in the EU such as the provisions for passenger car frontal and side crash safety, as well as pedestrian protection, gradually introduced over the last 15 years[14]. These vehicle safety developments were considered crucial as regards EU intervention contributing to the reduction of road accidents and fatalities/injuries in the last 15 years, making the EU the safest region in the word in terms of the vehicle safety area[15].

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8 CARE distribution of fatalities by mode of transport in the EU 2013

9 Source: 2002 report of the eSafety Working Group

10 COM(2012) 636 final

11 http://ec.europa.eu/transport/road_safety/pdf/com_20072010_en.pdf

12 http://ec.europa.eu/transport/road_safety/pdf/studies/eldersafe_final_report.pdf

13 http://ec.europa.eu/transport/road_safety/specialist/knowledge/pdf/vehicles.pdf

14 WHO global status report on road safety, 2015, section 3

15 The evaluation of the EU Policy Orientations on Road Safety 2011-2020[15] concluded that "the motor vehicle safety legislation, in particular, implemented before 2011 is likely to be making a large contribution to reductions in deaths and serious injuries in all EU 28 countries in the current target period. This area of activity is by far the most efficient and effective of all Commission road safety activities, adds the most value to what can be achieved by Member States" - http://ec.europa.eu/transport/road_safety/pdf/study_final_report_february_2015_final.pdf

Specifically in order to protect pedestrians and other vulnerable road users such as bicyclists, a set of comprehensive requirements have been introduced and phased in for light passenger cars from 2005 to 2013, and are phased in for heavy cars and vans since 2011 to 2019. Comparison of the EU situation in 2013 with that of 2004 as regards the number of fatalities of pedestrians and bicyclists, demonstrates a 37% and 32% reduction of fatalities respectively[16].

The General Safety Regulation has introduced mandatory driver safety belt reminder, ISOFIX connectors to safely install child seats in cars and tyre-pressure monitoring to prevent car tyre blow-outs that can lead to loss of control. Lane departure warning and autonomous emergency braking were made mandatory for new trucks and buses and electronic stability control systems and daytime running lamps were introduced for all motor-vehicles. These recent measures were phased in just between 2011 and 2015. It is therefore noted that, given the still relatively low market penetration of the technologies used, a detailed assessment of their effectiveness could not yet be carried out.

4. MONITORING OF ADVANCED VEHICLE SAFETY MEASURES

In accordance with the General Safety Regulation[17] and the Pedestrian Safety Regulation[18] the Commission has to monitor and report to the European Parliament and Council on technical developments in the field of enhanced passive safety requirements, the consideration and possible inclusion of new and enhanced safety features as well as enhanced active safety technologies. The commitments are laid down in Article 17 of the General Safety Regulation and Article 12 of the Pedestrian Protection Regulation.

4.1. NEW TECHNOLOGIES AND UNREGULATED MEASURES

In order to meet the monitoring and reporting objective, the Commission set out in 2014 to launch the study assessing *Benefit and Feasibility of a Range of New Technologies and Unregulated Measures in the fields of Vehicle Occupant Safety and Protection of Vulnerable Road Users in the context of the General Safety and Pedestrian Safety Regulations*, which was published in the EU Bookshop in March 2015[19].

Both the preparation of the study's terms of reference by the Commission as well as the detailed information and input during the course of the analysis work that was subsequently carried out on behalf of the Commission, have benefited greatly from intensive stakeholder interactions and consultations. It was also intensively discussed with authorities of Member States and international partners prior to completion.

The Commission wanted to ensure that the information was compiled and provided with the aim to enable prioritisation of possible future safety measures. To achieve this, the study provides an overview of feasibility and cost-benefit assessment of a wide range of 55 candidate measures for possible inclusion in the revised General Safety and Pedestrian Safety Regulations. The outputs of the study are indicative cost-benefits provided in order to

[16] CARE percentage change in number of fatalities by mode of transport 2013
[17] OJ L 200, 31.07.2009, p. 1
[18] OJ L 35, 4.2.2009, p. 1
[19] http://bookshop.europa.eu/en/benefit-and-feasibility-of-a-range-of-new-technologies-and-unregulated-measures-in-the-field-of-vehicle-occupant-safety-and-protection-of-vulnerable-road-users-pbNB0714108/;pgid=Iq1Ekni0.1lSR0OOK4MycO9B0000BAJ9tQVy;sid=OT_-Ap3uO3P-V8j2wGFgpf_Lm_yCUpo9P-w=

differentiate those measures that are very likely, moderately likely or very unlikely to provide a benefit consistent with the cost of implementation.

In the context of this Commission Report, the preliminary assessment of enhanced safety features has been further elaborated and has been transformed into a list with specific selection of measures that could be both cost effective and feasible. These measures include the introduction of active systems such as automatic emergency braking systems and active lane keeping technology, enhancement of passive safety features such as seat belt reminders on all seats, as well as improved pedestrian cushioning in case of head impacts onto the front of cars and bicyclist detection in case of imminent collision. Other areas of high interest concern the improvement of direct vision and elimination of blind spots on trucks to protect vulnerable road users. A comprehensive overview is given in section 5 and all details are provided in the Staff Working Document accompanying this Report.

4.2. VOLUNTARY FITMENT

Consumer car assessment and rating programmes, such as the European New Car Assessment Programme (Euro NCAP)[20], have encouraged vehicle manufacturers to develop vehicles that are safer than required by the EU vehicle safety legislation and to fit state-of-the-art advanced safety technologies to an extensive portion of their models on the market. It is without a doubt that these efforts are also contributing to the high level of safety on EU roads.

However, whereas manufacturers in general would strive to obtain the highest possible star rating for their top selling models in key Member State markets, there are indications that not all countries receive an equal distribution of high-ranked cars in their respective markets. In some cases specific low-ranked models are specifically targeted for certain (less affluent) markets and not available in the others. In other cases the normally high-ranked models will actually perform less well in real life, because they are stripped of the non-mandatory advanced safety features in specific countries, for instance for reasons of cost reduction linked to local taxation policies. This common practice can be explained because of the (up to recently) used rating scheme rule that not all, but only a majority of rated cars sold should be fitted with a given safety feature[21].

As a result of the above, there are clear indications that not all EU citizens have access to cars with an equal high level of safety depending on the internal policies and allocation strategies of vehicle manufacturers and their importers, notably in what regards the purchase power of the consumers in a specific market, leading to the situation that one out of every five cars bought does not necessarily have the advanced safety features on board which the star rating would imply. Still, many of the features promoted by the rating programmes are commonplace and, due to economies of scale, their cost should have fallen considerably over the past years. Making these features mandatory could help making the protection levels more even.

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[20] Euro NCAP is a voluntary European car safety performance assessment program backed by the European Commission and several European governments, as well as by motoring and consumer organisations. Euro NCAP publishes safety reports on new cars, awarding 'star ratings' based on the performance of the vehicles in a variety of crash tests, including front, side and pole impacts, and impacts with pedestrians. The top rating is five stars.

[21] http://www.euroncap.com/en/about-euro-ncap/how-to-read-the-stars

4.3. ASSESSMENT OF PRESENT SAFETY BASELINE AND FUTURE FOCUS

To allow for a more ambitious and harmonised safety situation in the whole of the EU, the review of EU vehicle safety regulations should assess the safety features envisaged for possible mandatory inclusion to achieve an improvement of the level of safety of vehicles towards the level that is consistent with the current baseline offered by mainstream best-selling cars in the EU.

Regarding commercial vehicles and buses, the situation also requires attention. Whereas for passenger cars the focus is on the protection of the occupants and on protection of pedestrians and other vulnerable road users, this is not always evident for the other vehicle categories. Although elementary safety features such as general construction integrity and safety belts, as well as autonomous braking and lane departure warning systems are now required, relatively little attention has been given to further promote and improve the levels of safety offered by these vehicles. This is in conflict with a need to better protect the occupants of such vehicles given their still significant share of casualties, and to protect bicyclists and pedestrians that are increasingly involved in accidents leading to severe injuries and deaths in EU cities[22].

4.4. FURTHER STUDIES TO BE CARRIED OUT IN THE FIELD OF VEHICLE SAFETY

In light of regulatory actions in other regions of the world, notably that of the USA and Japan, the Commission deems it appropriate to initiate studies to investigate the specific accident types that are addressed in those regions with the aim to confirm whether or not similar occurrences in the EU needs attention. Such studies are to obtain an up-to-date overview for the EU situation and to identify countermeasures that may need to be taken. These accidents could concern frontal crashes, side crashes, roll-over accidents and rear crashes, notably with a focus on the effects due to the proliferation of SUVs with higher centres of gravity, higher masses and aggressive front-end design, linked to injuries to diverse and vulnerable occupants as well as to vehicle fires resulting from crashes. A list of proposed studies is included in the attached Commission Staff Working Document.

4.5. NEED TO IMPROVE AVAILABILITY OF EU-WIDE IN DEPTH ACCIDENT DATA

For every person killed in traffic crashes, many more suffer serious injuries with life-changing consequences. The serious injuries are not only more common but also often more costly to the society because of long-time rehabilitation and healthcare needs.

Central to the strategy of casualty reduction is the requirement for good quality in depth accident data. Such data is seen as a fundamental pre-requisite for the formulation and monitoring of road safety policy in the EU. Data is needed to assess the performance of road and vehicle safety and to support the development of further actions. It has already been identified many years ago that no single accident database available in the EU so far could meet all the needs and that there are major gaps, including regarding in depth accident and injury causation[23].

As from 2015, Member States started to report for the first time data on serious injuries based on the international MAIS3+ trauma scale (Maximum Abbreviated Injury Score) applying to seriously injured. This is an important step in the right direction. However, there is need to

[22] CARE distribution of fatalities by mode of transport in the EU 2013 vs 2011

[23] ETSC (2001)

debate the need to deploy an initiative that starts collecting EU-wide in depth accident data that can be used for policy-making in the area of road safety.

Further revisions of vehicle safety rules, as well as any other road safety measures, would benefit from a wider availability of accurate EU-wide in depth accident data.

5. KEY ISSUES TO BE ADDRESSED IN THE REVIEW AND POSSIBLE UPDATE OF THE REGULATIONS

Four main areas of action have been identified consisting of 19 specific measures to increase vehicle safety. At this stage, based on our analysis as highlighted in section 4.1. above, the selected measures indeed appear to be feasible and cost-effective but should be subject to further studies. To carefully assess whether this is the case or not, they should in a next step be subject to further debate with stakeholders and further analysis by the Commission, in order to eventually arrive at an irrefutable assessment of their impact to indeed boost EU vehicle safety.

A concise overview of the targeted measures is provided in the main vehicle safety areas outlined below.

5.1. ACTIVE SAFETY MEASURES

This main area covers measures that have the ability to avoid accidents altogether rather than to mitigate their outcome and is generally considered the most important area of future vehicle safety legislative advancement. The safety features covered are: automatic emergency braking, intelligent speed adaptation, lane keep assistance and driver drowsiness and distraction monitoring.

5.2. PASSIVE SAFETY MEASURES

This area covers accident mitigation measures consisting of introduction of new requirements or enhancing of existing measures in the field of: emergency braking display (flashing stop lamps), seat belt reminder, frontal crash testing, side crash testing, rear crash testing, alcohol interlock device interface standardisation, crash event data recorder and tyre pressure monitoring.

5.3. TRUCKS AND BUSES

The measures under consideration to improve the safety of trucks and buses are the introduction or improvement of: front-end design and direct vision, truck and trailer rear underrun protection (rear bumper), lateral protection (side guards) and fire safety for buses.

5.4. PEDESTRIAN AND CYCLIST SAFETY

Finally, this area foresees the introduction of pedestrian and cyclist detection (linked to automatic emergency braking systems), head impact protection on A-pillars and front windscreen, as well as reversing (backing up) detection of persons behind vehicles.

6. CONCLUSIONS

Vehicle safety rules in force in the European Union today consist of a comprehensive package with proven effectiveness and track record, as highlighted above in section 3. The action plan

outlined in in the Commission Communication "Towards a European road safety area: policy orientations on road safety 2011-2020"[24] covers extensive aspects that impact road safety, notably vehicles themselves, but also driver behaviour and road infrastructure. The interim evaluation of this policy[25] confirmed the important and very substantial progress in reducing road deaths. The study also concluded that motor vehicle legislation is in fact a critical area in terms of impact on the reduction of casualties.

This Report to the European Parliament and the Council provides a comprehensive overview and proposes a way forward as regards improved vehicle safety for the benefit of all road users, that is to say, all citizens of the European Union. The Commission has reviewed measures with potential to provide incremental but significant improvements to address a range of vehicle safety related issues. The Commission will consider which of these might be brought forward in legislation following appropriate impact assessments of the costs and benefits including consideration to the cumulative impact on the competitiveness of the EU industry and a reasonable time-line allowing industrial adaptation.

Any new requirements on safety of vehicles for European roads should spur further innovation and investment to create quality jobs in the EU and bolster the competitiveness of EU industries. They should also reinforce the Union's commitment to deliver robust reductions in greenhouse gas emissions as part of the strategy to combat climate change.

[24] http://ec.europa.eu/transport/road_safety/pdf/com_20072010_en.pdf
[25] COM(2015) 116 final