European Automobile Manufacturers Association

ACEA

ACEA Position Paper

General Safety Regulation Revision

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ACEA European Automobile Manufacturers Association

KEY MESSAGES

a. The European Automobile Manufacturers' Association (ACEA) is a strong supporter of the EU objective of reducing road casualties and thus welcomes the initiative to revise safety regulations.
b. An integrated approach is needed, examining the benefits that can be achieved by combining new technology with improving road infrastructure and driver behaviour.
c. Active safety measures can reduce the number and consequences of accidents.
d. Passive safety measures will have fewer benefits than active safety measures and may have negative impacts, such as increasing CO_2 emissions.
e. Safety will also be further improved by the introduction of autonomous driving features, but the successful roll-out of this technology will require a coherent approach across all services within the European Commission, as well as the member states.

KEY RECOMMENDATIONS

Based on the proposed measures of the EU General Safety Regulation (GSR):

a. The focus should be on active safety measures.
b. Detailed cost-benefit analysis and impact assessment are needed for all measures considered, separated into different vehicle categories.
c. When considering measures with an effect on the same type of accidents (eg collisions with pedestrians), synergies have to be factored in to avoid solving the same problem twice.
d. The measures need to take into account the different usage and characteristics of vehicles (passenger cars, light commercial vehicles, heavy trucks, etc).
e. ACEA considers the following measures most effective: autonomous emergency braking (AEB) systems (M_1, N_1, stepwise introduction); emergency braking display (EBD) (M, N); lane keeping assistance (LKA)/lane departure warning (LDW) (M_1, N_1); safety belt reminders (SBR) (M, N; all front seats; only buckling monitor on rear seats on M_1 vehicles; further exemptions to be considered such as removable seats, etc); alcohol interlock interface (AI) (M, N, instruction sheet); crash event data recorder (EDR) (M_1, N_1); reverse detection (M, N_1, N_2); tyre pressure monitoring system (TPMS) (M_1, N_1); front-end blind spot cameras and detection (M_2, M_3, N_2, N_3); frontal crash full width protection (M_1, N_1 derived from M_1); pole side impact protection (M_1, N_1 derived from M_1); lateral protection (N_2, N_3, O_3, O_4); fire safety of CNG buses (M_2, M_3); fire suppression for buses (M_2, M_3); and rear crash test (M_1, N_1).
f. All measures need to be harmonised with the provisions of the United Nations Economic Commission for Europe (UNECE) regulations; specific EU regulations have to be avoided.
g. Transition time must be aligned with product development time, allowing at least three years for new vehicle types from the date the regulation has entered into force and the final requirements are available.

INTRODUCTION

Despite a three-fold increase in traffic, road safety in Europe has improved significantly in the last 30 years. Maintaining this trend is important for an industry that prides itself on designing, producing, and selling safe, comfortable, and efficient vehicles in probably one of the most demanding markets in the world. The industry has a number of priorities in the field of safety that it wishes to see addressed.

Regulation (EC) 661/2009 of the European Parliament and Council, amended by the European Commission Regulations (EU) number 407/2011, 523/2012 and 2015/166 (GSR) governs the type approval requirements for the general safety of motor vehicles, as well as their trailers, systems, components, and separate technical units. The regulation lists the compulsory implementing measures and the vehicle types to which each regulation applies.

In addition, Regulation (EC) 78/2009 on the type approval of motor vehicles with regard to the protection of pedestrians and other vulnerable road users (VRUs) (the 'Pedestrian Safety Regulation') has replaced Directive 2003/102/EC with modified and more advanced provisions, adapted to technical progress. These modifications include passive safety requirements to mitigate the risk of critical injury in the event of a collision between a vehicle and a person.

The GSR requires the Commission to report to the European Parliament periodically with proposals for amendments to the regulation or other relevant community legislation. These proposals relate to the inclusion of new safety features that meet the criteria of the CARS 2020 Action Plan and the policy orientations on road safety 2011-2020. The Pedestrian Safety Regulation also requires the Commission to provide monitoring reports to the European Parliament.

The automotive industry is a strong supporter of further reducing road casualties and thus welcomes the initiative of revising safety regulations to introduce solutions with the potential to substantially reduce the number of accidents and related injuries. However, any approach needs to consider actions related to vehicles, infrastructure, and driver behaviour in an integrated way. There has to be an appropriate policy mix, combining regulatory and other measures, defined on the basis of an in-depth impact assessment.

INTEGRATED APPROACH

Road safety is a complex phenomenon, resulting from a combination of various factors and interactions between stakeholders. Factors include road user behaviour, road infrastructure, road traffic rules and their enforcement, vehicle fleet age and composition, vehicle design, etc. Isolating one of these factors, while neglecting the others, will not yield the desired benefits; this calls for an integrated approach.

The global automotive industry suggests that the main focus of future initiatives to improve road safety should address all these types of measures. This means looking not only at the vehicle but also at the driver (education and enforcement), maintenance, and the road infrastructure.

The industry understands that the Commission's (DG Growth – the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs) proposed measures currently focus on vehicle design alone. However, corresponding activities at DG MOVE (Directorate-General for Mobility and Transport) to improve the infrastructure should also be implemented.

When looking at vehicle design in isolation, the measures to improve road safety can be classified as:

- Preventive – active (primary);
- Passive (secondary);
- Post-crash (tertiary).

The first group includes all measures that can avoid or at least mitigate emergency situations or can actively help the driver to manage them properly without having an accident. The second group reduces the consequence of the accident. The third group (eg emergency calls) gives help to the affected persons after a collision and also minimises the time between the accident occurring and the intervention of rescue services.

HORIZONTAL APPROACH IN THE GENERAL SAFETY REGULATION REVISION

When only in-vehicle technical solutions are considered, a horizontal approach should be considered, as in the revision of the GSR. This is important when multiple measures are considered. In defining and evaluating the potential benefits of each measure, their influence on other measures needs to be taken into account.

There are several measures that are strongly correlated; the list below is not exhaustive:

- Driver distraction accidents will be reduced by AEB (Advanced Emergency Braking), LDW (Lane Departure Warning) and LKA (Lane Keeping Assist) systems.
- Small overlap frontal crash accidents will be reduced by AEB, LDW and LKA systems.

- AEB for pedestrians will reduce the need for additional passive safety measures such as the protection of adult pedestrians from head to A-pillar impact. It is preferable to avoid accidents wherever possible, rather than simply mitigate the consequences.
- UN Regulation No 135 regarding pole side impact protection will also deliver benefits in protecting far side occupants.
- AEB will prevent or reduce the severity of frontal and side crashes.

In general, advanced sensors/systems will increase driver awareness of the vehicle surroundings, assisting him/her to drive safely and avoid accidents. A more detailed description will be given in the accident analysis in the following chapter.

As a general criterion, the global auto industry suggests that, whenever different measures can provide benefits in a certain accident scenario, active/preventative measures should take priority, since they can deliver greater benefits and/or avoid accidents completely, rather than simply mitigating their effects.

ACCIDENT ANALYSIS AND ACTIVE SAFETY

Following the positive contribution of passive safety systems during the last few decades to mitigating the consequences of accidents, active safety now offers a huge potential to further improve road safety. In order to assess this potential, a detailed analysis of UK, German and French, German and UK accident statistics has been carried by the Transport Research Laboratory (TRL) and Centre Européen d'Etudes de Sécurité et d'Analyse des Risques (CEESAR). The proposals of the European auto industry are based on this accident analysis for each of the following proposed measures.

Note that the range of percentages given indicates the maximum and minimum values obtained from the various accident studies.

Small overlap crashes

According to the accident analysis, the current small target population of fatalities identified during small overlap accidents could be reduced further from 2.6-3.5% to 1.3-2.2% by the use of active safety systems. Along with electronic stability control (ESC) and AEB, LDW and LKA play the most important roles in reducing this kind of accident. Owing to the large percentage reduction that could be obtained from using such systems, ACEA suggests that additional physical crash tests should not be introduced. The implementation of such tests would require additional structural elements, increasing the weight of the vehicle in question and thus increasing CO_2 emissions significantly.

Pedestrian adult head to windscreen

With regard to this type of accident, AEB systems show a reduction of 30.4-54.8% in the numbers of killed or severely injured pedestrians and cyclists (see table below). In comparison, a pedestrian protection airbag (PPA) achieves an effectiveness of 0.4-0.9%. As a consequence, in this type of accident situation, ACEA recommended that AEB systems are introduced; AEB systems can also affect a larger target population than PPAs.

Measurement	Effectiveness for killed and severely injured pedestrians/cyclists versus M1 front		
	VOIESUR	STATS19	GIDAS
AEB	-30.4%	-45.9%	-54.8%
ISA	-0.7%	-2.0%	n/a
PPA	-0.7%	-0.4%	-0.9%

Far-side occupants in side impact crashes

According to the accident analysis, the target population of fatalities in this type of event can be reduced by ESC, AEB and intelligent speed adaptation (ISA) systems from (4.6-4.9%) to (3.2-3.7%). In this accident situation, head and thorax injuries are most frequent, head injuries being caused mainly by contacts with the car interior. To reduce the incidence of such head injuries further, development of the commonly fitted side curtain airbags and the effect of seat belt reminders in all seating positions will potentially provide benefits. ACEA recommends that more research work is undertaken to better understand the injury mechanisms and, based on that research, more solutions for this accident type could be developed.

Speeding

The accident analysis shows a target population of fatalities of 16.4-20.8% resulting from speeding. The following benefits in reducing fatalities are expected, based on studies of this type of accident:

- Benefit of ESC, LDW/LKA, AEB: 6.0-8.0%
- Benefit of ESC, ISA: 5.2-8.7%
- Benefit of ESC, SLI: approximately 3.5%

ESC, LDW/LKA and AEB systems deliver strong benefits and are recommended by ACEA to improve this kind of accident situation. In due course, ISA will provide improvements that will reduce speed-related accidents when the infrastructure of speed limit signs, maps, etc becomes sufficiently reliable to provide the vehicle with up-to-date speed limit information (SLI). Because of this, the European auto industry suggests, as a first step, using SLI (switchable system), which still provides

significant benefits. In conjunction with the introduction of SLI systems, ACEA recommends that the infrastructure of speed limit signs is updated using new technologies, such as short-range signs to aid vehicle communication as needed, updated digital mapping, etc. When this has been achieved, the introduction of ISA could be considered (for more details, see also the chapter on speeding below).

Front and side impact exemptions

Concerning front and side impact accident situations for vehicles that are currently exempted from the regulation (vehicles mass > 2.5 t/R-point > 700mm), the accident analysis shows that, for front impact, the current small target population of fatalities identified can be reduced from 1.3-1.4% to 0.7-0.8%, mainly by LDW/LKA then by AEB or ISA and then by ESC systems. For side impact the modest target population of fatalities can be reduced further from 0.3-0.5% to 0.2-0.42% by AEB, ESC and ISA systems. In addition, the extension of UNECE Regulations 94 and 95 seems to have a small effect, as the vehicles in the category already have a high level of protection.

Truck vision

To address vision-related accidents with trucks, the accident analysis shows that the population of fatalities of 3-4% can be reduced by:

- Best in class visibility cabin: 0.10%
- Low entry concept for all trucks: 0.95%
- VRU-detection systems: 1.40%
- VRU-AEB systems: 1.53%

The requirement for low-entry concepts for all trucks would have an unaffordable impact on the truck, as well as on the transport industry, as the overall layout of trucks, including the available transport capacity, would be greatly reduced. In addition, active safety systems will show increased effectiveness on the reduction of fatalities and injuries in the case of vision-related accidents. As a consequence, the truck manufacturers suggest introducing active safety systems for vulnerable road users (VRUs) in combination with direct and indirect vision systems to achieve a holistic approach that will also be the most influential in improving the safety of VRUs.

Analysis of vision-related accidents with trucks shows that N2 light commercial vehicles derived from M1/N1 have much lower rates.

Autonomous emergency braking

ACEA members are in favour of considering a requirement that all new type approvals for passenger cars have mandatory AEB systems. The manufacturers agree on the gradual introduction of various levels of AEB, initially detecting moving vehicles, followed by stationary objects, then pedestrians and, at a later stage, cyclists.

SPEEDING

Exceeding speed limits is an important factor in one-third of fatal accidents (source: European Transport Safety Council (ETSC)). Speed limiters are already installed on all commercial vehicles/buses. For passenger cars, speed warning/limiters are also already widely available. Several models provide the driver with information on the speed limit, derived from digital maps and/or from a camera sensor.

Regarding infrastructure, information on speed limits is not reliable enough; maps are not fully populated with SLI for all road networks and data are not always updated. Camera-based systems cannot anticipate all scenarios, such as:

- traffic signs misplaced or covered;
- conditional speed limits (eg those that apply only in the event of rain or during school hours); and
- implicit speed limits (urban/rural/highway).

In the revision of the General Safety Regulation, the ISA (intelligent speed assistant) is discussed as being mandatory in future new vehicles. Based on the outcome of the accident analysis (see the previous chapter), ACEA members suggest a step-wise approach for passenger cars as follows:

- Promoting harmonisation of traffic signs at European level and processes for rapid updating of SLI in digital maps.
- Incentivising implementation and use of speed limiters linked to speed limits.
- Developing and implementing new, effective solutions for providing reliable SLI to the vehicle, based on, for example, short-range communications.
- Mandating ISA on new vehicles based on the new solution.

Until the third point is completed, ACEA has suggested promoting the voluntary introduction of ISA on new vehicles, requiring that SLI, where available, is linked to the speed limiter.

Concerning heavy-duty vehicles, ACEA notes that these vehicles mainly travel outside urban areas and already have speed limiters regulating their maximum speed. Therefore, no additional measures are proposed.

ALCOHOL

Up to 2% of all kilometres driven in the EU are associated with an illegal blood alcohol concentration (BAC) (European Road Safety Observatory, 2006). Driving under the influence of alcohol is one of the three leading causes of traffic fatalities. Official statistics show that 11% of all road deaths across the EU are alcohol-related (ETSC, 2010).

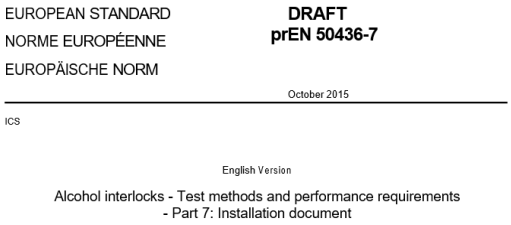
A number of European countries are planning, or have in place, programmes allowing offenders

(people found driving with an excess BAC) to use only cars equipped with an alcohol interlock.

During a recent stakeholder meeting, the alcohol interlock industry reported that it is complex to interface an alcohol interlock with a number of new advanced fully-electric or hybrid vehicle models.

The Commission planned to include a measure in the GSR revision to ensure that, in future, an alcohol interlock can be easily installed in all new vehicle models.

The European automotive industry supports this plan, working in the European Committee for Electrotechnical Standardization (CENELEC) ad hoc group to define a standard 'installation document' (CEN 50436-7). The Commission can then introduce a measure in the GSR revision that will require original equipment manufacturers (OEMs) to provide such a document. This will ensure that an alcohol interlock can be installed in all future models of passenger cars.


EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 50436-7

October 2015

ICS

English Version

Alcohol interlocks - Test methods and performance requirements
- Part 7: Installation document

VULNERABLE ROAD USERS

In 2013, 21.6% of Europe's approximately 26,000 fatalities were pedestrians (ERSO, 2015). The European Commission therefore considered different measures during the revision of the GSR for reducing the numbers of casualties among VRUs, such as pedestrians and cyclists.

European automobile manufacturers are working to improve pedestrian safety by introducing AEB systems in a number of new models. In 2016, the European New Car Assessment Programme (Euro NCAP) introduced specific tests of AEB systems with pedestrians. ACEA members have contributed strongly to defining the Euro NCAP testing protocol, developing – with the support of the automotive suppliers – an articulated dummy (with moving legs) to maximise the realism of the scenario.

Given the appropriate timeline, extending AEB systems for pedestrians to all new models of passenger car could be considered. With an additional lead time, AEB systems to detect cyclists could also be considered.

AEB is expected to result in a huge reduction of the number of rear end car-to-car accidents (35-41% fewer; source: International Research Council on Biomechanics of Injury (IRCOBI), Folksam and STA, 2014). Its effectiveness in urban areas, where vehicles travel at lower speeds, may be even higher. Given the proven benefits shown by the accident analysis relating to

VRU protection (for details, see the chapter on accident analysis and active safety) achievable with AEB, ACEA does not see the need to mandate further passive safety measures requiring external protection against a pedestrian's head colliding with the A-pillar or windscreen. The triggering of additional risks by other issues related to external protection has not yet been assessed in detail.

For heavy-duty vehicles, measures are already being considered for VRU protection, such as additional side/turning indicator lamps. ACEA members support revising the exemptions for lateral protection and, based on the information in the chapter on accident analysis and active safety, introducing active safety VRU protection systems for improving driver awareness of surrounding road users. This kind of system will always be aware with no loss of attention. Their use, in combination with direct and indirect vision, will provide the best performance. In addition, increasing market efforts to promote the safest truck for the intended job is suggested.

Regarding the proposal for safer truck front end design, that is, to extend drivers' direct field of view, ACEA recommends analysing the relative costs and benefits in detail. The costs are very high for truck cabins, while the benefits – in addition to those from sensor-based solutions – seem limited.

DRIVER DISTRACTION

The use of mobile devices while driving and the resulting driver distraction are increasing factors in road accidents. The USA has seen recent proposals to equip road police with 'textalyser' devices, which can verify whether or not the driver has been using a mobile device.

Automotive manufacturers are working on this issue in two ways:

- Developing the on-board systems of new vehicle models to minimise driver distraction during their use, following the European Statement of Principles (ESOP).
- Providing vehicles with systems such as LDW or (LKA) to avoid involuntary lane or road departures caused by distractions. AEB will also help in avoiding accidents with vehicles ahead due to driver distraction.

By including feedback from AEB and LDW/LKA systems, it is possible to make the driver aware of critical situations in the event of distraction or drowsiness. As a consequence, the driver will be able to focus on the critical area where a risk is arising and react in an appropriate way. Using driver-monitoring cameras would raise severe concerns about privacy, so ACEA does not suggest this. In addition, it is not currently possible to determine whether or not, for example, a driver would be distracted by using a driver-monitoring camera.

In addition, ACEA suggests addressing driver distraction by promoting, through both education and enforcement, improved driver behaviour concerning the use of mobile devices.

For on-vehicle systems, ACEA members are open to considering measures to ensure that the ESOP guidelines have been followed in the design of the human–machine interface. If the cost–benefit

ratio is positive, trip time monitoring will also be supported by ACEA members. In addition, more research work regarding driver distraction and the effect of mitigation systems (eg facial recognition) is suggested.

PASSIVE SAFETY

As mentioned in the general approach above, ACEA members suggest giving priority to active safety systems in the revision of GSR, given their potential benefits and capacity for reducing both the consequences and number of accidents. Additional passive safety measures may have negative consequences, including increasing CO_2 emissions.

However, some passive safety measures could be considered if the cost–benefit ratio is positive, including:

- Extending SBR to all front seats in all vehicles and rear seats in passenger cars; in some cases, exemptions need to be considered, for example in the case of removable seats;
- Full frontal crash protection for passenger cars;
- Pole impact crash protection for passenger cars;
- Improving rear underrun protection for heavy-duty vehicles; and
- Reducing exemptions from lateral protection on heavy-duty vehicles.

ACEA suggests reconsidering the following measures (for more details, see the chapter on accident analysis and active safety):

- Small overlap crashes: AEB, LKA and LDW systems will reduce the number of these accidents. Only additional benefits need to be considered.
- Far side occupant protection: pole side impact regulation will require new technology, including side airbag curtains and seat belt reminders, and will also benefit far side occupants. ESC penetration and future AEB systems will prevent or reduce the severity of side crashes.
- Extending the scope of existing frontal and lateral impact crash protection to all M1 and N1 vehicles: ACEA members believe that this extension will bring no additional benefits, especially for vehicles with a high seating position. In addition, ESC, LDW/LKA and AEB systems will contribute to improving these accident situations.

FIRE PROTECTION

ACEA members are in favour of considering the introduction of fire extinguishers in the engine compartment of future bus models and revising UNECE Regulation 110 for buses powered by CNG.

TYRE PRESSURE MONITORING

ACEA does not see a need to revise the regulation of TPMS. However, ACEA members acknowledge the proposal for amending the current regulation to include reasonable new requirements, as long as they are technology neutral.

Before extending the current regulation – currently limited to passenger cars – to all vehicle categories, including trailers and truck–trailer combinations, ACEA recommends that a thorough and detailed cost–benefit analysis is carried out.

CRASH EVENT RECORDER

The availability of a crash event recorder in vehicles will be helpful. However, the direct benefits for safety by promoting better driver behaviour are not evident. ACEA supports the implementation of crash event recorders comparable to US Part 563 if the cost–benefit ratio is positive.

IMPROVED ACCIDENT DATA

ACEA members fully agree on the importance of having high-quality, detailed accident data. This will improve understanding of the benefits of those systems that are already available and help to estimate the potential benefits of new ones. This is the reason ACEA commissioned an accident analysis from TRL and CEESAR prior to the revision of the GSR.

For the future, ACEA suggests:

- Continue use of the Community Road Accident Database (CARE, which is pan-European) to identify large-scale traffic accident spots within Europe and to ensure harmonisation of accident data collection and reporting throughout Europe.
- Improve the accuracy of injury data collection and reporting by encouraging a link between police and hospital data; currently the reporting of non-fatal casualties differs between countries.
- Support in-depth data collections, such as IGLAD (Initiative for the Global Harmonisation of Accident Data), which gathers, in a harmonised format, in-depth accident data from various countries.
- Collect data from crash event recorders and surveillance cameras, where national regulation permits, to obtain new data about the crash and pre-crash phases, which could also be used for accident reconstruction; however, issues such as privacy, data security, and harmonisation must be considered seriously.

AUTOMATED VEHICLES

The introduction of more highly automated vehicles to the market is planned in the coming years. Initial field experiments on public roads and with non-professional drivers are scheduled for 2017. In the European Road Transport Research Advisory Council (ERTRAC) Automated Driving Roadmap (2015), industrial-scale production is planned to commence in 2020.

With the implementation of larger scale use of automated vehicles in the future, there is the potential to reduce or at least mitigate further accidents, as this kind of vehicle, especially with higher automation levels, will be well equipped with sensors and evaluation equipment. This will also reduce the need for certain road safety measures planned for the near future. Therefore, a discussion based on well-proven facts has to be undertaken in the future.

The global auto industry agrees that the scenario of the large-scale introduction of automated vehicles is not sufficiently mature to begin considering any reduction in the passive safety of vehicles. However, this factor should not be ignored and needs to be considered in the roadmap of future improvements in vehicle passive safety.

CONCLUSIONS AND RECOMMENDATIONS

ACEA members welcome the Commission initiative to further improve road safety through the revision of the General Safety and Pedestrian Safety regulations.

As previously indicated, ACEA members are open to considering a large number of the proposed measures, while expressing concerns on only a few. The measures considered are (*N1 two years later):

- AEB (M1, N1*): step-wise introduction – step 1, moving obstacles; step 2, stationary obstacles; step 3, pedestrians; step 4, cyclists
- EBD (M, N)
- LKA/LDW (M1, N1*)
- SBR (M, N): all front seats; only buckling monitor on rear seats on M1 vehicles; exemptions to be considered for removable seats and seats in a row with a suspension seat
- AI (M, N): instruction sheet
- EDR (M1, N1)
- Reverse detection (M, N1, N2)
- TPMS (M1, N1): technology neutral requirement
- Front end blind spot cameras and detection (M2, M3, N2, N3)
- Frontal crash full width (M1, N1 derived from M1)
- Pole side impact (M1, N1 derived from M1)
- Lateral protection (elimination of exemptions; N2, N3, O3, O4)
- Fire safety of CNG buses (M2, M3)
- Fire suppression for buses (M2, M3)
- Rear crash test (M1, N1)

ACEA recommends that all measures should consider:

- The possibility of solving the problem with other initiatives, by looking at driver behaviour and following an integrated approach.
- A horizontal approach, looking at the benefits of other considered measures, avoiding addressing issues that will be completely or partially solved through other measures;
- A detailed cost–benefit analysis and impact assessment for all considered measures, separated into different vehicle categories.
- That the impact assessment has to take into account the impact on other European priorities, for example the impact of passive safety measures on vehicle weight and consequently CO_2 emissions.
- That heavy M1/N1 vehicles and M2/N2 vehicles should be evaluated separately from more lightweight vehicles, since they have a different design-principles.
- That the measures need to take into account the different usage and characteristics of vehicles (passenger cars, light commercial vehicles, heavy trucks, etc).

- That all measures need to be harmonised with the provisions of the UNECE regulations and specific EU regulations have to be avoided.
- That transition time must be aligned with product development time, allowing at least three years for new vehicle types from the date the regulation has entered into force and the final requirements are available.

Finally, it is important to take into account automobile manufacturers' efforts to bring automated vehicles to Europe's roads in the near future. This trend should be taken into account in the GSR. Active safety measures that will also be 'integrated' in a medium-term perspective in automated vehicles should take priority over passive safety measures.

BIBLIOGRAPHY

TRL, CEESAR and ACEA: accident analysis, November 2017

LIST OF ABBREVIATIONS

AEB: autonomous emergency braking

AI: alcohol interlock interface

BAC: blood alcohol concentration

CARE: Community Road Accident Database

EBD: emergency braking display

EDR: crash event data recorder

ESC: electronic stability control

ESOP: European Statement of Principles

GSR: General Safety Regulation

ISA: intelligent speed adaptation

LDW: lane departure warning

LKA: lane keeping assistance

OEM: original equipment manufacturer

PPA: pedestrian protection airbag

SBR: safety belt reminders

SLI: speed limit information

TPMS: tyre pressure monitoring

VRU: vulnerable road user

ACEA European Automobile Manufacturers Association

ABOUT ACEA

- ACEA represents the 15 Europe-based car, van, truck and bus manufacturers: BMW Group, DAF Trucks, Daimler, Fiat Chrysler Automobiles, Ford of Europe, Honda Motor Europe, Hyundai Motor Europe, Iveco, Jaguar Land Rover, PSA Group, Renault Group, Toyota Motor Europe, Volkswagen Group, Volvo Cars, and Volvo Group.
- More information can be found on www.acea.be or @ACEA_eu.

ABOUT THE EU AUTOMOBILE INDUSTRY

- 12.6 million people – or 5.7% of the EU employed population – work in the sector.
- The 3.3 million jobs in automotive manufacturing represent almost 11% of EU manufacturing employment.
- Motor vehicles account for almost €396 billion in tax contributions in the EU15.
- The sector is also a key driver of knowledge and innovation, representing Europe's largest private contributor to R&D, with more than €50 billion invested annually.
- The automobile industry generates a trade surplus of about €90 billion for the EU.

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