



POLICY POSITION ON THE GENERAL SAFETY REGULATION



Executive Summary

With the revision of the General Safety Regulation, the European Union has expressed its aim to improve road safety by upgrading its technical and legal framework to take new safety technologies into account. FIA Region I welcomes the EU's ambitious safety targets and encourages mandating proven safety technologies as standard for all vehicles.

Active in-vehicle safety:

- The mandatory introduction of Autonomous Emergency Braking systems and Lane Keep Assistance systems in passenger cars
- The fitment of Seat-Belt Reminders to all seats in passenger cars category M1 and light commercial vehicles category N1.

Passive in-vehicle safety:

- The adoption of the new standard for pole-testing (UN Regulation No 135) in the crash-testing of passenger cars
- An improved rear underrun protection of Heavy Duty Vehicles

For a full list of the advanced safety technologies and FIA Region I's stance, please see the [annex](#).



Introduction

FIA Region I urges the European Union to support ambitious safety targets in its policies. High vehicle safety standards place European motor vehicles amongst the safest in the world. These standards promote research and development, thus contributing to the long-term competitiveness of the European automotive industry.

Several driver assistance systems can help avoid collisions or minimise their consequences. The EU has a decisive role to play in speeding-up the deployment of many active safety systems. Electronic Stability Control (ESC), estimated to save 4,000 lives a year, was introduced in cars in the early 1990's but the technology only reached its full life saving potential in 2014, when it was made mandatory in all vehicles.

For the revision of the General Safety Regulation, FIA Region I offers an assessment of several optional stand-alone in-vehicle technologies. We also propose recommendations for improving the passive safety of vehicles. Cooperative technologies, because they are currently not regulated under vehicle type-approval, are not addressed here despite their safety potential.

The list of in-vehicle technologies considered in this document is based on:

- Vehicle based 'priority systems' identified by the [iMobility Forum](#)
- Systems promoted by EuroNCAP as part of its 'Advanced Rewards' for driver assistance systems
- FIA Region I's Mobility Clubs' accident research data on the causes of accidents

FIA Region I believes driver assistance technologies need to be brought to end-users, and we have conducted various technology roadshows - such as the [eSafety Challenge](#) and [iMobility Challenge](#). A

Regulators should consider the level of consumer acceptance and demand for advanced vehicle safety systems

key success factor in the implementation of technology is informing users on the technology's benefits as consumers can easily switch off features or ignore warning signals. Regulators should also consider the level of consumer acceptance and demand for systems¹.

¹ It is also deemed important that at the international level the naming convention of active safety systems is harmonised as well as their intervention characteristics, for consumers to know what may be expected from such systems in an emergency and to prevent confusion.



Systems or functionalities are considered in isolation by the Regulation. However, systems that use the same components can and will likely be bundled by manufacturers. For example, some sensors used for autonomous emergency braking can also be used for pedestrian and cyclist protection, lane departure warning, or traffic sign recognition. This spill-over potential is often not factored into safety analysis and cost/benefit calculations.

Autonomous Emergency Braking (AEB) systems

Rear end collisions occur very frequently in road traffic. In Germany, the ADAC conducted extensive accident investigations and found that they represent 24% of accidents. In the UK, around 70% of insurance claims for whiplash injuries arise from such accidents².



^{2,3,4}: TRL, [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](#), 2015.

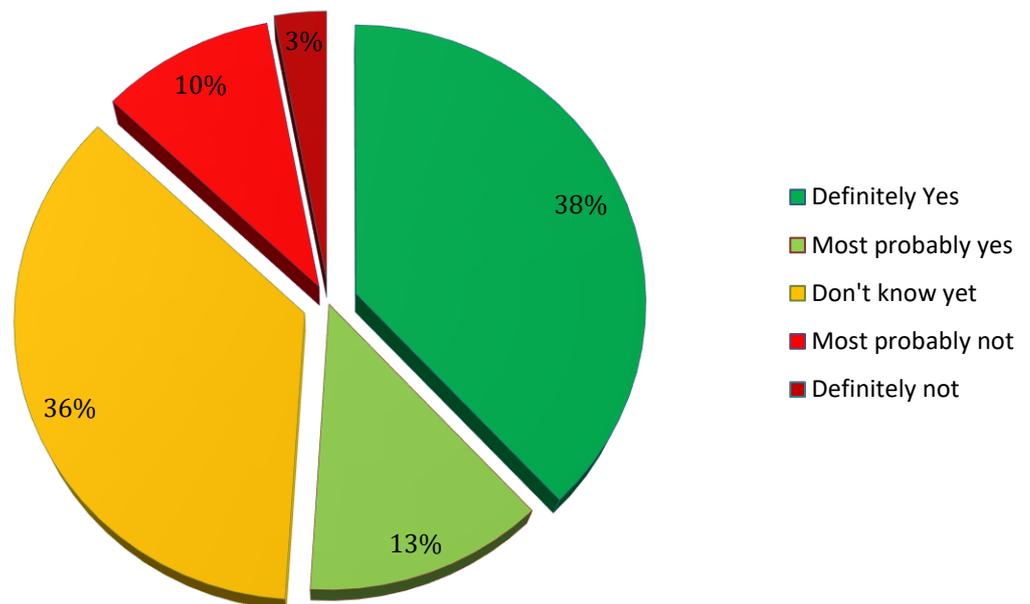


The speed range over which an AEB system operates depends on the type and complexity of sensors used. The clear majority of collisions happen at low speed in urban environments. In such scenarios, AEB uses cost-effective Lidar technology, for which the manufacturer price has steadily decreased over time and is estimated at less than €100³. This type of system promises to enhance traffic safety in urban areas. Radar and camera sensors are used for more advanced systems and combining different types of sensors in fusion allows for complex functionalities such as pedestrian and bicycle detection.

Cost/benefit studies for this technology typically show a cost/benefit ratio close to 1 (break-even)⁴, but rarely consider that the hardware used by AEB also enables additional driver assistance functionalities that further enhance safety benefits.

City/urban AEB systems are now widely available across all vehicle ranges (and on some vehicles AEB is standard). This has brought about a good level of consumer awareness. An iMobility Challenge consumer survey indicated that 55% of car drivers are aware of the technology, 38% would 'definitely like to have it' and 13% would 'most probably' like to have it in their next vehicle⁵. AEB was also the system for which the highest share of respondents (56%) were willing to pay for in their next vehicle.

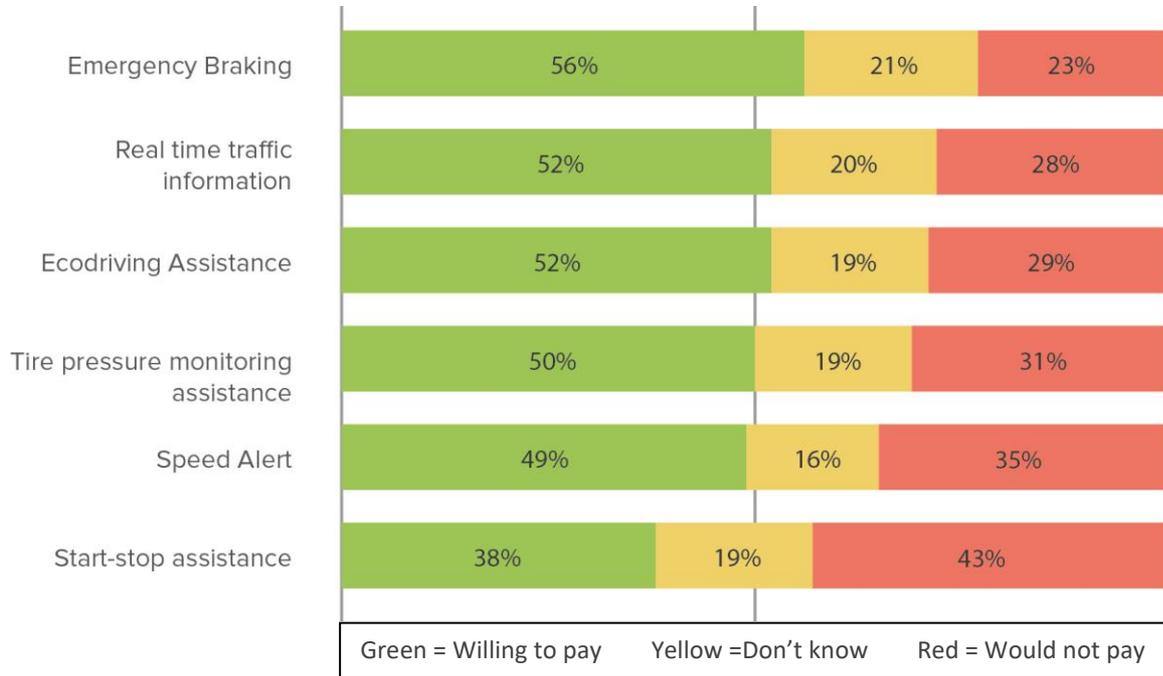
Would you equip your next car with AEB?



⁵: iMobility Challenge project: [Users' awareness and demand for in-vehicle technologies, 2014](#)



Which technologies would you be willing to pay for?



While there are wide variations on the scope of AEB benefits⁶, effects are always deemed positive. One study considers AEB could cut fatalities by 7% in the EU 25⁷. Insurance data also shows how car models equipped with AEB systems report a lower collision frequency compared to non-equipped vehicles⁸. According to the eIMPACT project results, advanced AEB systems with pedestrian detection could save billions of euros by preventing casualties⁹. The most optimistic figure is 4.5 billion Euros saved by 2023. The project highlights how gains should increase in time, with future systems expected to have better performing sensors.

EuroNCAP started testing AEB systems in 2014. While it confirms that performance varies depending on the systems, all the systems tested have a positive impact in real world critical situations.

Finally, the technology is designed to intervene at the very last moment through harsh/uncomfortable braking: it is reasonable to expect this should discourage driver adaptation (i.e. the risk that drivers over-rely on the technology to break for them).

⁶ http://www.esafety-effects-database.org/applications_18.html

⁷ Ecorys, Cost-benefit assessment and prioritisation of vehicle safety technologies, 2006. <http://www.roadsafetyobservatory.com/Evidence/Details/10803>

⁸ TRL, 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 - Active Safety Measures, 2015

⁹ <http://www.aspecss-project.eu/userdata/file/Public%20deliverables/ASPECSS-D1.3-FINAL-Benefit%20assessment%20methodologies-2014.04.30.pdf>



Conclusion

FIA Region I believes that given the frequency of rear end collisions, the affordable cost and pervasiveness of AEB systems, regulators should mandate the introduction of AEB systems to minimise the societal costs of collisions. It is of paramount importance that these AEB systems also operate at low vehicle speeds and are consistently detecting vulnerable road users such as pedestrians and cyclists. AEB intervention speed range and characteristics should be harmonised, so that drivers can know in advance what to expect from such a system and to avoid confusion. The full benefits from AEB can be gained if the system will be combined with other safety systems such as Lane Keep Assist, Blind Spot Monitor and can detect vulnerable road users such as pedestrians, cyclists and motorcyclists.

Blind Spot Monitoring (BSM)

BSM systems support medium and heavy-duty vehicle drivers, where blind spots are greater. It is also reported that BSM may be particularly suited to motorways where there are frequent lane changes and collisions have worse consequences.





The potential of the technology to assist Medium and Heavy-Duty Vehicle (MDV categories M2 & N2 and HDVs categories M3 & N3) drivers to detect vulnerable road users in their blind spot is confirmed in scientific literature as well as in practice. Cyclists, pedestrians and motorcyclists are particularly at risk when they find themselves in the blind spot of an MDV or HDV. FIA Region I believes the development and deployment of reliable technologies enabling the recognition of pedestrians and cyclists while they are in the blind spot of HGVs should be a priority.

Conclusion

FIA Region I believes that BSM can assist MDV and HDV motorists but does not see the need to mandate it for passenger cars. Motorists should not be led to believe that BSM always detects vehicles present in their blind spots: pedestrians, cyclists and motorcyclists in particular can still be missed in some traffic situations. The FIA Region I believes that BSM should be introduced in combination with AEB on MDVs and HDVs that have significant blind spots and where vulnerable road users are particularly at risk in case of accidents.

Intelligent Speed Assistance (ISA)

Advisory ISA is largely available to European motorists today through their navigation devices and the vehicle's electronic throttle/cruise control. However, there are concerns over the reliability of the speed limit information given by the infrastructure. Speed limits are not always accurately provided in several European Union countries. The alternative to ISA enabled by navigation devices, are camera-based systems. These however, are only as good as the availability of speed limit signs on the road. A recent test by the German automobile club ADAC, found weaknesses with all the ISA systems it tested¹⁰.

In Belgium and the Netherlands, a survey indicated that among respondents who have positive attitudes towards ISA, seven out of ten respondents would prefer to have a notification/warning system over an intervening system¹¹. In the UK, an AA survey of 17,481 respondents found 43% thought the compulsory introduction of 'controlling' ISA (i.e. an intervening system) would be acceptable compared to 49% who did not.

Informative or warning ISA applications are firmly established in the market and well-accepted. The active accelerator pedal could be an interesting alternative, especially if it also assists in specific situations, e.g. when approaching a red traffic light. Some drivers are already using adaptive cruise control (ACC) to set the desired vehicle speed. ACC systems are very convenient, adapting not only the current speed to vehicles ahead but also taking changing speed limits into account. Generally, warning, supporting and intervening systems of any kind will probably find acceptance only if they automatically

¹⁰ <https://presse.adac.de/meldungen/adac-ev/technik/intelligent-speed-adaptation.html>

¹¹ <http://www.steunpuntverkeersveiligheid.be/sites/default/files/RA-MOW-2010-005.pdf>



recognise the currently allowed speed limit and if ISA can be overruled by the driver at any point in time.

Conclusion

Drivers should be able to override ISA systems at all times or to deactivate them permanently, especially because the quality of local speed limits given by the infrastructure varies considerably. At present, FIA Region I does not deem it necessary to make ISA systems mandatory.

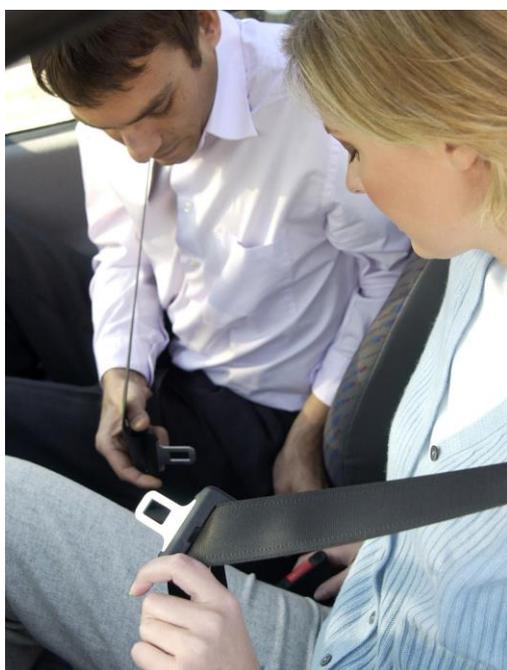
Lane keep assistance (LKA) systems

Lane keep assistance systems can help avoid a frequent cause of accidents: vehicles unintentionally leaving their lane or changing lanes when it is dangerous to do so because of oncoming vehicle. In Germany the ADAC conducted extensive accident investigations and recorded that 36% of accidents were caused by a vehicle leaving its lane.

Conclusion

FIA Region I is in favour of mandating LKA systems. The systems should be default on, but the driver should always be able to turn them off at any point in time. FIA Region I also encourages sustained efforts to improve and standardise Human Machine Interfaces (HMIs) so that drivers are not surprised by the information provided by LKA systems.

Fitment of seat belt reminders to all seats



The mandatory fitment of seat-belt reminders to all seats would help enforce EU legislation from 2006 mandating the use of seat belts on all car seats¹². All evidence shows that seat-belt wearing rates are consistently lower in the back seats compared to the front¹³. Reports suggest that certain regions in Europe have extremely low seat belt wearing rates in the back seat. Where it is hard to change users mentality on such a basic safety feature, mandatory introduction of seat belt reminders may be the most efficient way to achieve higher seatbelt wearing rates, especially on rear seats.

¹² Directive 2003/20/EC

¹³ TRL, [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](#) - Car Occupant and Pedestrian Safety, 2015.



The recommendation to fit reminders on all seats also figures in the [CARS 21 Final Report](#)¹⁴. It has been estimated that wearing the seat belt in the back seat reduced the risk of fatal injury by 25%¹⁵.

EuroNCAP has a seat belt reminder protocol recommending the fitment of seat belt reminders on all seats. For rear seats the protocol only requires a visual signal to be given to the driver and requires a visual and audible warning when a seatbelt is unbuckled, in the absence of rear seat occupancy information. Vehicle manufacturers increasingly equip their vehicles with this feature, which contributes to their safety rating. The protocol encourages the detection of occupancy in the second and third seating rows and recommends applying audible and visual signals.

Conclusion

FIA Region I believes that seat belt reminders should be fitted to all seats in all category vehicles (M1, M2, M3, N1, N2, N3).

The EU should continue to improve the level of passive safety technologies in vehicles for situations where crashes do occur and are not mitigated or prevented by active safety systems.

Passive safety systems

Side pole testing simulates sufficient side-impact crash protection with solid narrow objects such as trees and sign posts that can otherwise lead to severe consequences. FIA Region I encourages the EU to make mandatory UN Regulation N°135 regarding Pole Side Impact performance. UN Regulation N°94 on frontal collision protection and N°95 on lateral collision protection need to be urgently updated, in particular and among others to make the THOR impact dummy mandatory as of 2021, aligned with Euro NCAP requirements. The THOR dummy offers safety researchers a much better level of assessment owing to the fact that this dummy type significantly better represents the human body and the subsequent injury level after a simulated crash. The current exemptions in the scope of UN Regulation N°94, 95 and 135 must be deleted. The scope of passive safety requirements should include all M1 and N1 category vehicles. In addition, far-side occupant protection shall be made mandatory for these vehicle categories.

Passive safety of Heavy Duty vehicles

¹⁴ <https://www.fiaregion1.com/wp-content/uploads/2018/06/Cars-21-High-Level-Group-2012.pdf>

¹⁵ <http://www.roadsafetyobservatory.com/HowEffective/vehicles/seat-belts>



Improvements are needed in the crash compatibility of heavy goods vehicles with smaller vehicles and vulnerable road users. Special focus should be placed on reducing space under the rear bumper of a truck

The crash compatibility of HGVs with other vehicles and vulnerable road users is an area where improvements should be made. In particular, rear underrun, the space under the rear bumper of a truck, should be reduced. UN Regulation N°58 provides a definition of mounting height for rear under-run protective devices (RUPDs) and the test loads an RUPD must withstand. FIA Region I finds the current UN Regulation to be insufficient: every year, approximately 40 car occupants suffer fatal injuries in rear-end collisions with HGVs on German roads alone, while approximately 400 are severely injured.

A crash test conducted by ADAC has shown that RUPDs are effective and life-saving only if they conform to the requirements below:

- Specification to test loads of 150kN and 200kN respectively applied in three test points simultaneously – instead of consecutively.
- Reduction of RUPD maximum mounting height to 450mm – both for HGV with hydraulic suspensions and steel-sprung vehicles.
- RUPD maximum offset forward of the rear of 100mm – both for HGV with and without a lift platform.

RUPD optimisation would not cost more than €100 per vehicle¹⁶.

¹⁶ Data from the VC Compat project funded by the EU Commission; <http://vc-compat.rtdproject.net>



Annex

Overview of the technologies under review for the GSR update

EC Proposal GSR Measures	FIA Region I Assessment
Autonomous Emergency Braking (AEB)	FIA Region I supports mandatory fitting of AEB. Coupling the AEB with other accident prevention systems makes sense, such as: Emergency Braking Display, Lane Keep Assist, Driver Drowsiness, Blind Spot Monitor, Pedestrian and Cyclist Detection
Pedestrian and Cyclist Detection by AEB	FIA Region I supports mandatory introduction of pedestrian and cyclist detection by AEB. The proposed introduction date of cyclist detection by September 2026 is too late and should be brought ahead to September 2022.
Emergency Braking Display (Stop Signal), rapidly flashing of the brake lamps when full brakes are applied	FIA Region I believes that this feature distracts drivers more than that it helps to make a braking manoeuvre more visible.
Intelligent Speed Assistance (ISA)	The driver should always be able to override ISA system intervention and if deemed necessary be offered the possibility to permanently switch it off. This is because the quality of local speed limits varies greatly across Europe. FIA Region I does not deem mandatory fitment necessary.
Lane Keep Assistance Systems	FIA Region I supports mandating LKA systems under the following conditions: <ul style="list-style-type: none"> • It should not be a pure Lane Warning Assistant, but a Lane Keep Assistance system • The driver should be able to switch the system off
Seat Belt Reminders	FIA Region I supports mandatory introduction, as these are highly cost beneficial and effective systems. The EU should make the latest UN Regulation N°16 Rev. 8 Amendment 4 mandatory to ensure that all seats are equipped with seat belt reminders.
Driver Drowsiness or Distraction Monitoring	FIA Region I is against mandatory introduction if it is a purely informative system (for example, a coffee cup is displayed at regular intervals) <p>* Compulsory introduction is only useful if mature fatigue detection becomes available (not just a stopwatch function) such as those systems equipped with steering pattern monitoring or vehicle position in lane monitoring, but not with driver eye/face monitoring using an in-vehicle camera watching the driver's face (privacy issue)</p> <p>In addition, the result of driver monitoring should influence the sensitivity of the emergency assistants (AEB, LKA).</p> <p>* Continuous monitoring of the driver (e.g., via camera) should be prohibited when approving the system</p>



EC proposal GSR measures	FIA Region I Assessment
Frontal Crash protection	<p>FIA Region I supports several changes of frontal crash protection legislation:</p> <ul style="list-style-type: none">* Raise UN Regulation N°94 crash speed from 56 km/h to 64 km/h* Introduction of new measurement equipment needed, e.g. state-of-the-art THOR crash dummies* Expand scope to include all categories M1 and N1;* Addition of full-width crash test UN Regulation N°137 for M1 and N1 <p>However, FIA Region I does not support the additional introduction of a small-overlap crash test for M1, as active safety systems can better address the problem</p>
Side Crash protection	<p>FIA I supports:</p> <ul style="list-style-type: none">* Introduction of new measurement equipment, e.g. state-of-the-art THOR crash dummies* Expand scope to include all M1 and N1 categories. Deletion of current scope exemptions is supported by FIA Region I* UN Regulation No 135 regarding Pole Side Impact Crash Test - is endorsed by FIA Region I, provided that the worldwide rules are adopted from UN Global Technical Regulation No 8 on head restraints* Addition of far-side occupant protection - is endorsed by FIA Region I as it will also be assessed by Euro NCAP from 2020 onwards
Rear Crash protection	<p>FIA I supports:</p> <ul style="list-style-type: none">* Introduction of new measurement equipment needed, e.g. state-of-the-art THOR crash dummies* The speed of 80 km/h stated in the USA FMVSS is to be carried over as part of a revision of UN Regulation No34 regarding prevention of fire risks* The NHTSA has defined a complete procedure for electric vehicles, to be carried over into UNECE & EU legislation
Alcohol Interlock Devices	<p>A compulsory, non-event-related introduction of an alcohol interlock interface for all M and N category vehicles is not supported by FIA Region I, as it is not cost-beneficial and risks an unnecessary cost increase passed on to the consumer</p>



EC proposal
GSR measures

FIA Region I Assessment

Event Data Recorder	<p>FIA Region I is against mandatory fitting of an EDR on conventional and on low level automatised vehicles (up to SAE level 3):</p> <ul style="list-style-type: none"> *Risk of privacy breach and misuse of data is significantly higher than the benefits * Nearly the whole fleet in the EU is already equipped with an EDR. Making it mandatory is over-regulation * In the DG MOVE impact assessment there are questionable monetary benefits listed and only the cost passed on to consumer * Technical comparisons with airplanes and sports cars are not appropriate owing to component quality differences. High concerns with endurance/durability requirements of large series production vehicles after the end of useful life (drift) and reliability (millions of controller software bugs) * FIA Region I can accept 'if fitted' requirements, standardising signals and restricted accessibility only for authorities. Unlike in the USA where the minimum number of parameters are regulated, in the EU the maximum number of parameters logged should be limited * For highly automated vehicles FIA Region I can accept fitting of a Data Storage System for automated controlled steering functions, specifically <i>and only for automatic steering functions</i> <p>For more details see our position paper http://www.fiaregion1.com/policy-position-on-event-data-recorders/</p>
Tyre Pressure Monitoring Systems (TPMS)	<p>FIA Region I welcomes obligatory introduction of TPMS for categories M and N vehicles as well as for O3 and O4 trailers, even if additional costs for individual systems are to be expected of consumers (directly measuring TPMS).</p> <ul style="list-style-type: none"> * A TPMS requirement is proposed in the Commission's Staff Working paper to have TPMS mandatory for new types from 9/2020 and for new vehicles from 9/2022. These proposals are necessary, very relevant and overdue. * <p>Tyre pressure is sometimes indicated as root cause of very serious accidents involving trucks. In addition, there are often tyre failures during operation on the road, which cause corresponding traffic disruptions</p>
Front-end Design and Direct Vision of HDV	<p>FIA Region I is in favour of the mandatory introduction of a blind spot monitor for HDV. This should be coupled with an AEB to have a warning / information system and an accident prevention function.</p>



EC proposal GSR measures	FIA Region I Assessment
Truck Rear Underrun Protection	FIA Region I judges the current UN Regulation N°58 to be insufficient to ensure safety of passenger cars. Rear underrun protective devices (RUPDs) strength test must become more severe and dimensions (height) must be adapted to modern car bumper height to improve crash compatibility.
Truck Lateral Underrun Protection	FIA Region I supports the approach of the European Commission, but at the same time supports the mandatory introduction of a blind spot monitor, which should be coupled with an AEB to obtain an accident prevention function
Fire Safety for category M2 and M3, Buses	FIA Region I is in favour of mandatory introduction on new busses and retrofitting of buses with fire detectors for the engine compartment, toilet and galley.
Head Impact on A-Pillars and Front Windscreen	<ul style="list-style-type: none"> * The adult head impact zone must be extended * Make mandatory 2018 Euro NCAP VRU protection test requirements and assessment for M1 and N1 category vehicles (N1 derived from M1) - FIA Region I advocates an adjustment of the legal framework to correspond to 2018 EuroNCAP requirements * Coupling active VRU protection systems with AEB applications makes sense. However, passive VRU protection shall not be reduced as a trade-off with improved active safety systems; * AEB Pedestrian and Cyclist Detection for windscreen and A-pillar testing only is not supported by FIA Region I. It may be possible to reduce the impact speed if an AEB system is fitted, but an AEB system cannot address nor mitigate 100% of the accidents <p>"AEB does not always reduce the impact speed". The principle: No trade-off between active and passive security systems.</p> <p>Same test speed should be maintained, however, in the (hard) area of the A-pillar, the requirements must be adjusted</p> <ul style="list-style-type: none"> * The idea to use the A-pillar and possibly the upper windscreen frame has existed for more than a decade. - FIA Region I believes that other measures would be more economically viable and at the same time lead to an increased reduction of casualties and heavy injuries.
Reversing Detection	<p>A compulsory introduction is supported by FIA Region I.</p> <ul style="list-style-type: none"> * The topic is relevant for all vehicles. * The active avoidance of contact is important, which is why a coupling with an AEB is requested



FEDERATION INTERNATIONALE DE L'AUTOMOBILE
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Fédération Internationale de l'Automobile (FIA) Region I office

FIA Region I is a consumer body representing 107 Mobility Clubs and their 38.5 million members from across Europe, the Middle East and Africa. The FIA represents the interests of our members as motorists, riders, pedestrians and passengers. FIA Region I is working to ensure safe, affordable, clean and efficient mobility for all. Learn more at www.fiaregion1.com