

# General Safety Regulation Position Paper

How regulating vehicle design can help save lives

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October 2018

## Summary

The Commission published a proposal to review the General Safety Regulation (GSR) in May 2018. This Regulation defines safety technologies and design features that must become standard in new vehicles if they're to be sold in the EU. Over 25,000 people die each year as a result of road traffic collisions in the EU. Making all new vehicles safer is a big part of addressing this problem. The more well-defined and ambitious the GSR is, the more lives will be saved.

### 3 Ways to Strengthen the Commission's GSR Proposal:

**Minimum ambition levels** – Details of safety requirements are not provided in the Commission's proposal. Instead, the Commission outsources the development of details to a Geneva-based body known as the United Nations Economic Commission for Europe (UNECE). The EU must define the minimum requirements in the Regulation so that the UNECE has a framework that is adhered to.

**Shorter lead-in times** - The lead times for many of the technologies/design features are too far in the future. For example, direct vision for all trucks would not be an obligation before 2029 (assuming the final Regulation is agreed upon in 2019). This delay is unnecessary and undesirable for improving vehicle safety. Bringing forward the date to 2024 would ensure that vulnerable road users are protected sooner while giving manufacturers sufficient time to adhere to the new requirements.

**Deadlines for the UNECE** - There must be a clear delegation of power to the Commission to bring forward legislation if (a) the ambition level at UNECE does not meet the minimum ambition level outlined in the GSR or (b) timely progress is not being made at the UNECE. Specifically, the law needs to require the Commission to bring forward legislative proposals three years ahead of the deadlines provided for each safety feature in the Regulation so the EU is ready and able to step in if the UNECE is not delivering.

The Commission proposal covers all road vehicles and suggests different design features for different vehicle types. It proposes direct vision requirements for trucks and buses, which would oblige automotive companies to sell vehicles where the driver can see more of the road space around their vehicle. This is particularly important for protecting cyclists and pedestrians as trucks are often oblivious to such road users when in close proximity. Building trucks where the driver can see more could save 550 lives per year.

Amongst other technologies, the Commission proposes Intelligent Speed Assistance for all vehicles and Autonomous Emergency Braking Systems for cars and vans so that such vehicles brake automatically when impact with cyclists and pedestrians is imminent.

The details and ambition level of each standard is left to the UNECE to develop. Vehicle makers dominate the UNECE so relying on it is an open door for proposed safety

improvements to be watered down (as manufacturers are typically slow or unwilling to make the necessary investments).

## 1. Context

### 1.1. Road Safety

The EU has an objective to get to almost zero road deaths and serious injuries by 2050 (“vision zero”). The interim target is -50% between 2020 and 2030. The current target to reduce deaths to 15,000 by 2020 is unlikely to be met unless urgent action is taken as over 25,000 people still lose their lives on European roads every year<sup>1</sup>. The number of road fatalities has not decreased significantly since 2013<sup>2</sup>. Some EU countries are even seeing an increase in their numbers of road fatalities.

Deaths as a result of truck accidents are disproportionately high due to the fact that truck design, weight and size makes accidents involving such vehicles more likely to be fatal. Trucks represent 2% of vehicles on the road but are involved in almost 15% of road fatalities<sup>3</sup>. About 4,000 deaths are caused from truck crashes every year with approximately 1,000 of these involving (motor)cyclists or pedestrians.<sup>4</sup> The Commission expects the technology outlined in its proposal to save 7,300 lives between 2020 and 2030. This depends largely on how ambitious the standard for each lifesaving technology is.

Vehicle design plays a central role in reducing road deaths. A vehicle can be designed in such a way and fitted with technologies that make using that vehicle safer for the driver and other road users. This is what the General Safety Regulation intends as it mandates features that new vehicles must have by certain dates for them to be eligible for sale on the EU market.

### 1.2. General Safety Regulation

The General Safety Regulation (Regulation (EC) No 661/2009) sets out safety technologies and design features that must become standard for all new vehicles sold by defined dates (dates vary depending on vehicle type and technology). The purpose is to ensure that all new vehicles sold exploit the full potential of safety features on the market and to prevent such technologies from being reserved only for a few luxury models.

The Commission’s proposal provides that all road vehicles are to be fitted with intelligent speed assistance, reversing detection and reversing camera, driver distraction and drowsiness recognition, and tyre pressure monitoring systems. It obliges cars and vans to have lane keeping assistance and advanced emergency braking systems for pedestrians and cyclists. Finally, it means that trucks and buses would have a direct vision requirement, as well as cyclist and pedestrian detection systems. A lot of the technologies can be switched off by the driver.

Article 17 of the Commission’s proposal states that the Regulation applies “36 months following the date of entry into force of this Regulation”. This 3 year period forms the basis for the start dates of all of the proposed technologies. Some of the safety features will apply from the end of that 3 year period while others will start 10 years after the EU finalises the Regulation (i.e. 7 years from the application date). In short, the date by which a particular technology must be deployed as standard varies depending on the technology itself and the vehicle type. (Please see Annex 1 which maps out the likely timelines for key technologies, assuming a 2019 entry date).

The proposal outsources the formulation of the standards to the UNECE, which is a UN body. The UNECE has 62 countries or “contracting parties” who are members of an agreement established in 1958 aiming to formulate international standards. The EU countries have 28 seats. Decisions require at least 50% of votes<sup>5</sup>. In many cases the details of the GSR requirements, including how ambitious

<sup>1</sup> [https://ec.europa.eu/transport/road\\_safety/specialist/statistics\\_en](https://ec.europa.eu/transport/road_safety/specialist/statistics_en)

<sup>2</sup> [https://ec.europa.eu/transport/road\\_safety/sites/roadsafety/files/pdf/observatory/historical\\_evol.pdf](https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/observatory/historical_evol.pdf)

<sup>3</sup> 26,132 total fatalities in EU 2015. 3,848 involving trucks (EU CARE Database)

<sup>4</sup> [https://ec.europa.eu/transport/road\\_safety/sites/roadsafety/files/pdf/statistics/dacota/bfs2017\\_hqvs.pdf](https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/bfs2017_hqvs.pdf)

<sup>5</sup> [https://www.unece.org/fileadmin/DAM/env/lrtap/Rules\\_of\\_Procedure.pdf](https://www.unece.org/fileadmin/DAM/env/lrtap/Rules_of_Procedure.pdf)

they are to be, are left to the UNECE to define. This is an issue if we consider the fact that automotive company representatives sit in UNECE meetings acting ostensibly on behalf of a number of member states or independently in working groups. This leaves an open door for standards to be set at a level that the least progressive voices are happy to accept. As T&E mentioned in 2009 with regard to ineffective noise standards created at UNECE, decisions of such importance “must be taken out of these obscure UNECE working groups, and brought into the sphere of proper public debate with democratic oversight at EU level”<sup>6</sup>. This is the case for EU vehicle emissions regulation and should also apply to vehicle safety.

The EU must define a floor level of ambition in the Regulation, one that will be the basis of EU legislation failing sufficient action from the UNECE. The EU has delegated powers under the Regulation but no deadline is provided on when it would act in advance of deadlines if no progress is made at UNECE. There is a clear need for such EU-level deadlines. This would also provide more legal certainty for vehicle makers, allowing them to commit investment to safety knowing that - at the very least - certain standards will apply in the EU from a given date.

## 2. What the Regulation must include

### 2.1. Direct Vision Requirements for Trucks and Buses

“Direct vision” is the term given to what drivers can see directly through the windows of their vehicle. This is different to “indirect vision”, which is what a driver sees on a monitor or in a mirror. Seeing something “directly” has been shown to increase reaction speeds by 0.7 seconds<sup>7</sup>. In practice, improving reaction speeds by 0.7 seconds means a reduction of 5 meters in stopping distance if a vehicle is traveling at 25 km/h. 5 meters of additional travel before stopping can be the difference between life and death.

Direct vision requirements for trucks and buses are proposed by the Commission. Such requirements would be mandatory for new vehicles 7 years after the Regulation entering into force (as per the Commission’s annex, 36 months + 48 months) while it would be 10 years before all vehicles conform to the standard (36 months + 84 months). This lead time is remarkably long, especially considering the fact that many manufacturers have models that perform well from a direct vision perspective already today. The issue is that such vehicles are not the standard and are not being produced at a meaningful scale, which is why you mainly see such vehicles only when trucks are publicly procured. Trucks with very significantly enhanced direct vision must become the standard for roads to become safer. **2024 is a reasonable lead time for a direct vision requirement to become obligatory for all trucks sold in Europe.**

London is taking ambitious action to address cyclist and pedestrian deaths within the city<sup>8</sup>. London has developed a simulation model to assess the direct vision performance of the various trucks on the road. This model provides a rating for each vehicle from 0 to 5 stars. London will eventually stop the circulation of trucks within the city borders unless it achieves a certain star rating. This progressive approach is supported by other cities and the methodology developed for London should become the standard to avoid different cities having different systems, which is something that even truck manufacturers wish to avoid.

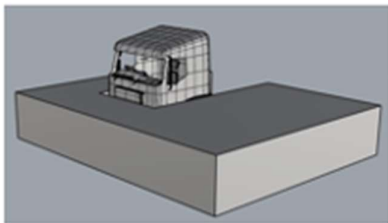
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<sup>6</sup> [https://www.transportenvironment.org/sites/te/files/media/2009\\_08\\_unece\\_noise\\_background.pdf](https://www.transportenvironment.org/sites/te/files/media/2009_08_unece_noise_background.pdf)

<sup>7</sup> <http://content.tfl.gov.uk/road-safety-benefits-of-direct-vs-indirect-vision-in-hgv-cabs-summary.pdf>

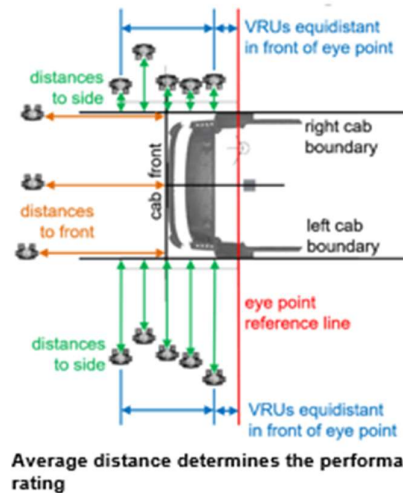
<sup>8</sup> <http://content.tfl.gov.uk/safer-lorries-scheme-traffic-regulation-order-2015.pdf>

## What should the driver be able to see



The DVS uses an assessment volume which takes dimensions from the area of the ground plane that is required to be seen from mirrors (UNECE reg 46).

## How far back does someone need to be from the truck before they can be seen by driver



Source: Transport for London

The biggest difference between London's system and what the Commission has proposed is that London's system applies to all vehicles on the road while the Commission intends to regulate new vehicles only. Under the current draft, the performance level of Europe's "direct vision requirement" is left to the UNECE to define with no guarantee in the proposal that it will ensure that safer vehicles become standard. T&E asks text to be included in the Regulation so that the UNECE knows the EU's minimum parameters for this requirement.

Therefore, **text should be included that ensures the requirement removes the blind spot at the front and driver's side of the truck while significantly reducing the blind spot on the passenger side.** This would provide some parameters by which the UNECE standard is to conform to. This is crucial for safer trucks to become the norm in Europe. Compared to the current draft text, such an amendment will provide far greater legal certainty to everyone from vehicle-makers and investors to lawmakers and all road users.

### 2.1.1. A Differentiated Approach

The Commission's cost-effectiveness analysis found that "the differentiated and best-in-class approach will result in different design requirements associated with the different categories of vehicle and thus offer opportunities for relative cost reductions for vehicle categories with a lower regulatory requirement"<sup>9</sup>.

Vehicles that perform the best from a direct vision perspective are so-called "low entry cabins" that are already in production by Volvo, Scania, Daimler, and others. These vehicles are often only bought when publicly procured. This is due to the fact that the specialised truck designs have not become the standard on the assembly line. A requirement that changes this so that well-performing direct vision trucks become standard on the market would mean safer trucks becoming commonplace on the road.



<sup>9</sup> [https://ec.europa.eu/growth/content/final-report-depth-cost-effectiveness-analysis-identified-measures-and-features-regarding-0\\_en](https://ec.europa.eu/growth/content/final-report-depth-cost-effectiveness-analysis-identified-measures-and-features-regarding-0_en)

Direct vision requirements for trucks would increase the competitiveness of European industry as many European manufacturers already have models that perform well from a direct vision perspective. The economic benefits go beyond those for the industry as the reduction in fatalities and injuries from direct vision would reduce the demands on the emergency services and the police, as well as cutting road closures and congestion. It could also reduce insurance prices due to the reduced casualty costs.

The trucks that spend most of their time outside of urban areas are more difficult to make “low entry”. The engine specifications and preference to be higher up on motorways hinders such redesign. These long-haul motorway trucks can still perform better from a direct vision perspective but not as good as urban trucks. This is why a differentiated approach is needed for direct vision. i.e. standards that are different for different truck types. A differentiated approach ensures ambition for the different truck categories. Put another way, any “one size fits all requirement” acceptable for long-haul trucks would fail to ensure substantially safer trucks in cities.

The European Parliament’s report on road safety<sup>10</sup> called for such a differentiated approach. The basis for differentiation could be the VECTO categories already formulated in EU legislation (governing climate emissions reductions from trucks). This would ensure consistency with existing EU legislation, which would reduce the complexity of categorisation.

The EU should adopt the methodology used to measure direct vision in London, which all manufacturers are already familiar with, and apply it to newly-built trucks according to their categorisation. The writing of detailed rules to classify trucks into urban, regional, long-haul, construction and any other categories should take place in legislative proposals drafted by the Commission.

Warning sensors may supplement but are no substitute for direct vision. In the hierarchy of road safety measures, designing out a hazard is the first step (e.g. direct vision improvements) whereas a warning of the threat (e.g. a sensor) should only be used when it’s not possible to design out the hazard.<sup>11</sup> Furthermore, if warnings are to be effective, the driver needs to be able to see *why* the warning sounds. There are also areas around the truck where direct vision is simply not possible (e.g. behind the cabin). Overall, both warning systems and direct vision are necessary for trucks to be safer. Automatic braking for pedestrians and cyclists is required in trucks to provide a backup in instances where the driver makes a mistake or still cannot see the threat. The figure below shows the need for both systems. The warning can also be considered as an emergency braking system.

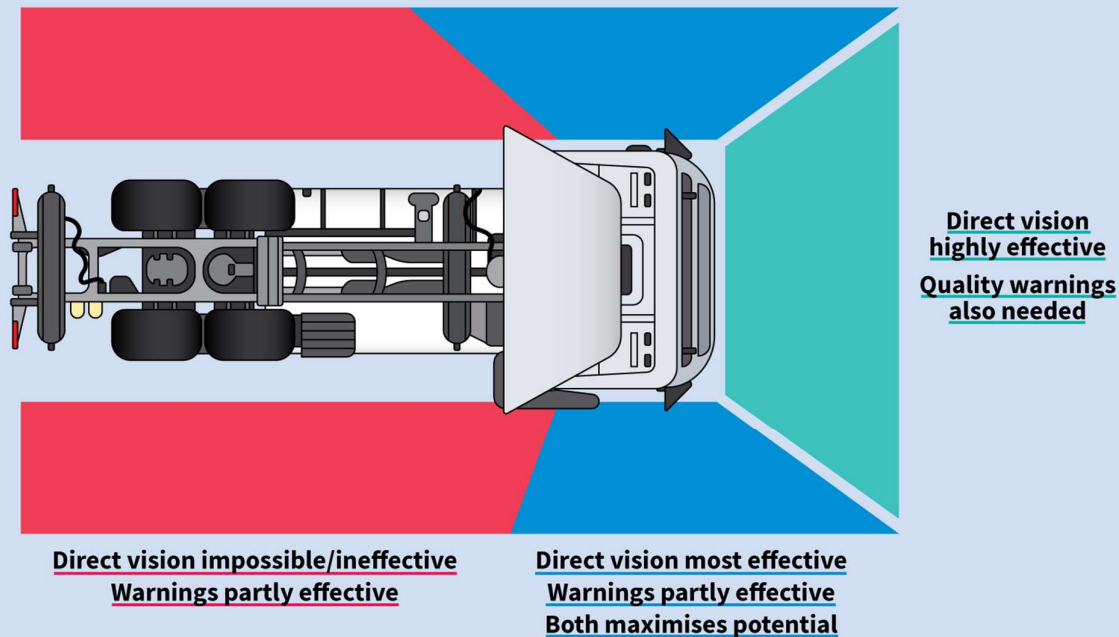
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<sup>10</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016DC0787>

<sup>11</sup> <https://www.cdc.gov/niosh/topics/hierarchy/default.html>

## Direct vision and sensors

Both are needed for safer trucks



## 2.2. Intelligent Speed Assistance

The Commission proposes to mandate intelligent speed assistance (“ISA”) on all road vehicles within 3-5 years from the Regulation entering into force. ISA is the term given to technologies that “know” the speed limit of the road driven on and sends signals or alters speed based on that information. The Commission proposes that the accelerator pedal lightly pushes back on the sole of the driver’s foot when the vehicle is going over the speed limit. This so-called “pedal pushback” or “haptic feedback” can be overridden by the driver pressing their foot down. It cannot be switched off.

Speed has a direct impact on CO<sub>2</sub> emissions. A faster speed means more energy is needed to propel the vehicle. More fuel needed means releasing more greenhouse gas emissions. CO<sub>2</sub> reductions from slight speed reductions range from 1% to 9% depending on road type<sup>12</sup>. This is the logic behind reduced speed limits on roads also being considered decarbonisation measures. Speed has a much larger impact on safety as vehicles are easier to manoeuvre and stop when traveling at lower speeds.

ISA should not only be pedal pushback though, this should be complemented with a mandatory signal on the dashboard and an audible signal when a driver is breaking the speed limit. ISA will clearly need to be more than a simple pedal pushback in an autonomous vehicle. The vehicle will need to “know” the speed limit and not be able to override unless there are exceptional circumstances. Therefore, the ISA application in the Commission proposal should be revised based on the maturity of the technology available.

## 2.3. Tyre Pressure Monitoring Systems

The Commission proposal extends the fitment of tyre pressure monitoring systems (TPMS) to all vehicles and updates the test taking the new methodology developed at UN level into account. TPMS monitors the level of tyre inflation and notifies the driver by a signal on the dashboard and/or an

<sup>12</sup> [https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/docs/ldv\\_speed\\_control\\_devices\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/docs/ldv_speed_control_devices_en.pdf)

audible warning when the tyre is dangerously underinflated. Tyre pressure can have an impact on the strength and performance (i.e. poor handling and increased stopping distances) of the tyre so this measure encourages drivers to keep their tyres inflated. Underinflated tyres also increase the risk of blowout. TPMS also has a marginal impact on reducing emissions because, if the user keeps their tyres optimally inflated, the fuel efficiency of the vehicle is slightly improved. The widespread application of TPMS can reduce GHG emissions and fuel consumption in the LCV and HDV fleets by about 0.2% to 0.3%<sup>13</sup>.

Extending TPMS to all vehicles is a positive measure by the Commission and should be further extended to include trailers so that truck drivers are aware of the tyre pressure of their trailer's tyres. A trailer tyre blow out can be dangerous, especially when it happens on a motorway. Put simply, making truck drivers aware of potentially dangerous levels of trailer tyre under-inflation would allow them to inflate the tyre for optimal performance and safety.

In addition to the extension and improvement of TPMS, the type-approval test for tyres should be improved for wet grip performance. Wet grip performance can worsen during the lifetime of a tyre so the test should be updated so that it is carried out on tyres that have been worn down to the legal limit (i.e. 1.6 mm). This would ensure the safety of tyres is guaranteed up until they reach the legal limit, which would also have a positive impact on reducing rubber demand from users prematurely replacing tyres.

## 2.4. Advanced Emergency Braking Systems

Advanced Emergency Braking Systems (so-called "AEBS") is the term given to technologies that stop a vehicle automatically when there is a danger of collision. AEBS has several applications and these are at different levels of market readiness. For example, there is AEBS for large inanimate objects, AEBS for vehicles in front of the vehicle, AEBS for behind or beside the vehicle, AEBS for pedestrians, and AEBS for cyclists.

The Commission proposes that AEBS for pedestrians and cyclists would be fitted on cars and vans within 5-7 years from the Regulation entering into force. It does not apply such AEBS to trucks. AEBS should become standard in all new vehicles without delay so that drivers who misjudge a situation or make a mistake are supported by an electronic system that stops the vehicle in the case of an emergency. This should apply to all vehicles, including trucks and buses, no later than 2025 with the application date for cars and vans being sooner.

## 3. The role of the UN in Vehicle Safety

The United Nations Economic Commission for Europe (UNECE) is a UN body that sits in Geneva. 62 contracting parties (incl. the EU, Russia, Korea, and Japan) signed an agreement back in 1958 to use the UNECE to create harmonised "global" standards in an attempt to reduce technical barriers to trade. The advantage in wider application are obvious but a downside is that UNECE standards are often set at the least ambitious level with companies heavily influencing the standard. This is contrary to a key goal of standards, which is to improve the performance of vehicles for socially beneficial purposes. This is why the EU develops its own standards for CO<sub>2</sub> and air pollutant emissions. The same should be the case for vehicle safety. At the very least, the EU must define the minimum requirements in the GSR so that the UNECE has a framework to guide it, and in the event of failure at the UNECE to at least match the EU's ambition level, the EU should be ensured the legislative authority to implement its own standards without delay. Unless manufacturers are clear on the minimum ambition levels and default application dates, their internal safety departments are in an extraordinarily weak position to make the investment case for new safety applications and product development.

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<sup>13</sup> [https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/heavy/docs/tno\\_2013\\_final\\_report\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/heavy/docs/tno_2013_final_report_en.pdf)

**The purpose of global standards makes sense only if such harmony does not restrict the ambition level of standards.** This is why more detail is needed in the text of the GSR proposal so that the UNECE standards are guaranteed to meet certain requirements. The “direct vision requirement” for example only says that such a requirement should exist but fails to detail what performance level is needed. This introduces a risk such standards will not ensure safer vehicles enter the market, or fail to enter in a timely fashion. Furthermore, the GSR must ensure that loopholes aren’t exposed that could undermine such standards.

As T&E mentioned in 2009 with regard to ineffective noise standards created at UNECE, decisions of such importance “must be taken out of these obscure UNECE working groups, and brought into the sphere of proper public debate with democratic oversight at EU level”<sup>14</sup>. There must exist deadlines in the GSR whereby the Commission is obliged to come forward with a legislative proposal detailing the standards if progress has not been made at UNECE level. Reports should be submitted to the Parliament annually by the Commission that outline the state-of-play at the UNECE. **The Commission should bring forward legislative proposals 3 years before the date when technologies are to be required with the Parliament determining whether the UNECE work is sufficient.**

## 4. Conclusions

There are options to reduce road traffic deaths that already exist today. These technological or design features should become standard as soon as possible so that lives are saved. An obvious example is direct vision whereby trucks and buses would only be required to have a direct vision requirement by 2029 (assuming the Regulation is finalised at EU level in 2019). This is not ambitious enough and the date should be brought forward.

Furthermore, ambition must be defined at EU level. The EU should not outsource such important decisions to the UNECE. The EU should formulate what a standard should include and then allow for the UNECE to work on that basis. An open door can lead to loopholes and a watering down of the proposal to the point where lives are not saved. Although the Commission proposal makes positive steps, the proposal can be strengthened in order to have a greater impact on protecting lives.

### 3 Ways to Strengthen the Commission’s GSR Proposal:

1. **Minimum ambition levels** - Most requirements in the Commission’s proposal are not detailed but are outsourced to the UNECE. The EU must define the minimum requirements in the Regulation so that the UNECE has a framework that it adheres to.
2. **Shorter lead-in times** - The lead times for many of the technologies/design features are too far in the future. For example, direct vision for all trucks would not be an obligation before 2029 (assuming the final Regulation is agreed upon in 2019). This delay is unnecessary. Bringing forward the date to 2024 would ensure that vulnerable road users are protected sooner while giving manufacturers sufficient time to adhere to the new requirements.
3. **Deadlines for the UNECE** - There must be a clear delegation of power to the Commission to bring forward legislation if (a) the ambition levels at UNECE do not meet the minimum ambition level set in the GSR or (b) timely progress is not being made at the UNECE. Specifically, the law needs to require the Commission to bring forward legislative proposals three years ahead of the deadlines provided for each safety feature in the Regulation so the EU is ready and able to step in if the UNECE is not delivering.

25,300 lives are lost every year on European roads. All of the features included in the Commission proposal are necessary for safer vehicle design. The more well-defined and ambitious the GSR is, the more lives will be saved.

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<sup>14</sup> [https://www.transportenvironment.org/sites/te/files/media/2009\\_08\\_unece\\_noise\\_background.pdf](https://www.transportenvironment.org/sites/te/files/media/2009_08_unece_noise_background.pdf)









## Further information





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## Annex 1: Entry Dates for Features of the GSR Proposal

**Commission Proposal Timeline (Presuming 2019 entry date)**

Technology	Car	Van	Truck	Bus
Direct Vision Standard 			New vehicle models: 2026 All models: 2029	New vehicle models: 2026 All models: 2029
Advanced Emergency Braking Systems (AEBS) for frontal vehicle/object collision* 	New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024	All models: 2022	All models: 2022
Tyre Pressure Monitoring Systems 	All models: 2022	New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024
Intelligent Speed Assistance 	New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024
AEBS for Pedestrians and Cyclists* 	New vehicle models: 2024 All models: 2026	New vehicle models: 2024 All models: 2026		
Collision Warning Signal for Pedestrians and Cyclists* 			New vehicle models: 2022 All models: 2024	New vehicle models: 2022 All models: 2024

\*Can be switched off

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Source: T&E