

Position paper of the European Transport Safety Council (ETSC) on the Commission's proposal for a Regulation on the protection of pedestrians and other vulnerable road users.

The European Transport Safety Council¹ welcomes the adoption of a Proposal for a Regulation on Pedestrian Safety by the European Commission which aims to update the existing legislation in this area. ETSC also welcomes the extending of the scope of the Directive to include heavy cars and vans.

Pedestrians are not only the most numerous but also the most vulnerable group of road users. While presenting no danger on the road themselves, they have literally no protection. In 2004, as many as 8,000 vulnerable road users, pedestrians and cyclists were killed and 300,000 were injured out of 43,000 road users killed and 1.7 million injured on EU roads.

It is therefore of paramount importance that the EC takes steps to improve the safety of this often neglected category of road users. Pedestrian-friendly legislation and regulations are the key element of the EU's road safety framework.

After a careful analysis of the proposal and intensive consultation with its independent experts, ETSC is seriously concerned about several elements of the proposed legislation.

A Issues related to the tests

In the first Transport Research Laboratory (TRL) feasibility report for the EC, published in June 2004, a number of proposals were made to revise phase 2 of the Directive. These included improvements to the test methods and protection requirements, based on new research. They also included changes which reduced pedestrian protection to take account of feasibility issues. However, with one minor exception the current EC proposals reduce the protection further than the TRL 2004 proposals. Note that the 2006 TRL feasibility study did not include the 2004 proposals but instead looked at the effectiveness of the current EC proposal.

¹The European Transport Safety Council (ETSC) is a Brussels-based non-profit making organisation dedicated to the reduction of transport crashes and casualties in Europe. ETSC seeks to identify and promote effective measures on the basis of international scientific research and best practice. It brings together 39 international and national organisations concerned with transport safety from across Europe.

1. Bonnet leading edge upper leg-form test

The retention in the second phase of the Regulation of the bonnet leading edge upper leg-form test only for monitoring purposes undermines the conclusions of the 2004 feasibility report carried by the EC contractor (TRL), which recommended mandatory protection for this area.

The EC proposal is not making use of the improved impact conditions proposed by TRL (EC contractor) who was also responsible for developing the test. Not only do these improve the validity of the test but they also, along with revised protection requirements, resolve the feasibility issues.

It is potentially dangerous to have an unregulated pedestrian impact area. This is particularly true for the bonnet leading edge which makes significant contact in many pedestrian accidents. The aggressivity of the bonnet leading edge is very dependent upon the vehicle's shape. The recent increase in the popularity of larger vehicles such as, off-road vehicle, soft-roaders and large pick-up trucks are likely to increase the risk of injuries from this area, as many of these vehicles have higher or more prominent bonnet leading edges. Other changes, such as those to improve the bumper area, can also lead to increased risk of bonnet leading edge injuries, unless controls are in place. ETSC strongly recommends that the bonnet leading edge test, with TRL's proposed improvements, remains mandatory, as in the second phase of the current Directive. If a mandatory requirement is not part of the initial stage, the test (with TRL's improvements) should initially be carried out for monitoring purposes with a fixed date set for a second stage where it would become mandatory, unless accident studies demonstrate that it is unnecessary. The EC should consider funding an accident study to compare the injury risk posed by car models with good and bad bonnet leading edges, as identified by the monitoring test or from Euro NCAP tests.

2. Headform test

a) *Lower impact speed used for the head-form to bonnet top test:*

The recommendation of the 2004 feasibility report specifically states that the impact speed of 40km/h should be retained for the phase two test. Given the expectation that reducing the severity of head injuries is likely to be the area that sees the largest benefit in terms of lives saved, it is disappointing that the Commission has elected to reduce the impact speed to 35km/h in the draft Regulation. ETSC believes that the conclusions of the feasibility report should be followed in the specifications for this test, retaining an impact speed of 40km/h. Reduction in head test velocity from 40 km/h to 35 km/h will significantly reduce protection. The TRL 2004 proposal at 40 km/h would provide approximately 20 percent more bonnet crush protection than the current EC proposal.

The EC Impact Assessment suggests that reducing the head velocity is justified by simulations carried out by IHRA which showed a lower average head velocity. However, in their last paper IHRA warned against this by reporting that *"Based on the PMHS test*

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and simulation result data variations as well as concerns about the biofidelity of the human models used in the computer simulation, the IHRA PS WG could not come to a solid conclusion to use average ratio of head-to-vehicle ratio for all vehicle shapes.” (Extract from IHRA ESV paper 2005).

ETSC recommends that 40 km/h should be retained for the head test method, following the EC contractor’s recommendations in their 2004 report.

b) *Change in transition from child to adult head test from 1500 mm to 1700 mm:*

This will in practice provide less protection for short adults or older children with heavier heads. For most cars this change will remove the zone safe for both child and adult heads intended by EEVC WG17 (and in phase 2 of the current Directive). This will be detrimental for short adults or older children with heavier heads as the protection for the 3.5 kg head is likely to be too soft and “bottom out” before the heavier head is stopped.

Accident data, considered by the IHRA Pedestrian safety group, shows that, depending mainly on pedestrian stature and car shape, a zone from about 1400 mm to 1700 mm wrap around distance can be hit by both child and adult heads, see Figure 1. Although these data have not been published it is the reason why IHRA had selected this as an overlapping child and adult zone in their test methods (Mizuno, 2003). For most cars the bonnet top test area extends rearwards more than 1500 mm. Therefore, under phase 2 of the old Directive (and EEVC WG17) most cars would have to pass child head test in the area in front of the 1500 mm line and behind it they would have to pass the adult head test. As it’s not possible to make a step change in stiffness within the same component in practice you would get a zone about the line that is safe for both the lighter heads of children and heavier heads of adults, by the provision of more crush depth. However, the EC proposal has changed the child to adult transition to 1700 mm. As the majority of cars produced, those of small and medium size, have a bonnets that finishes just short of 1700 mm they will only need to pass a child test therefore they will not have a zone safe for both child and adult heads. However, as already noted the IHRA accident data show heads impacts of both child and adult (taller children and short adults) overlap in a zone from 1400 mm up to 1700 mm. These short adults and taller children will have different head masses which would benefit from the zone of additional protection that would in practise be provided by a 1500 mm transition. Short adults and taller children are only a relatively small sub-group of the pedestrian population nevertheless retaining a 1500 mm transition will be provided them with better head protection.

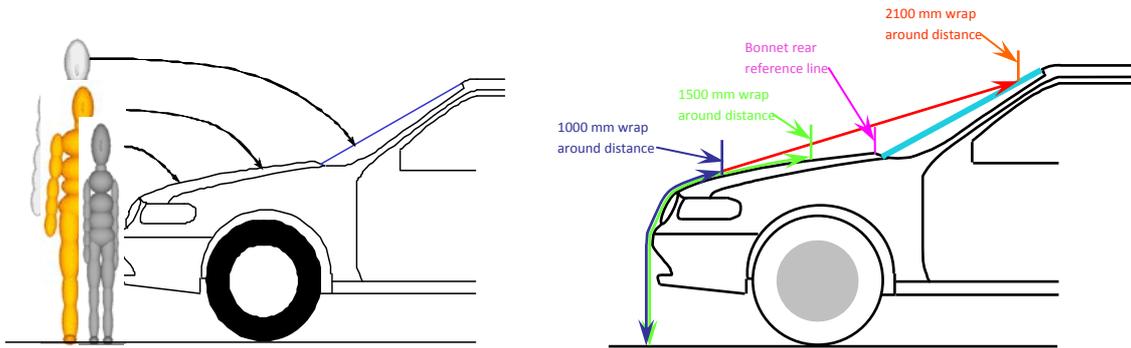


Figure 1 Wrap around distances for the head real life and current Directive's child and adult bonnet top zones (child 1000 mm to 1500mm and adult 1500 mm to rear bonnet reference line)

Therefore ETSC recommend that the 1500 mm wrap around distance be retained for the child to adult headform test transition.

3. Bumper test

a) The change from 15 degrees to 19 degrees is based on latest biomechanical data. At the time, both limits were selected to give an injury risk of approximately 20 percent. However, based on current knowledge, if 15 degrees were retained then the knee injury risk would be further reduced to about 10 percent. EuroNCAP tests of cars with pedestrian protection bumpers show that they already fully comply with the current Directives phase two requirements, this suggests that achieving 15 degrees is readily achievable. As knee joint injuries often result in permanent disability, a reduced injury risk would be particularly beneficial for quality of life.

ETSC recommends that 15 degrees be retained to further reduce the number of permanently disabling knee joint injuries.

b) The increase in lower leg acceleration from 150 g to 170 g will slightly increase the risk of lower leg fractures. This change was made to improve feasibility but recent EuroNCAP tests of cars with pedestrian protection bumpers suggest that it is not needed.

ETSC suggests that the original 150 g be retained, as tests by Euro NCAP show that change is unnecessary.

c) The 250g relaxation zone was added to improve feasibility for difficult areas, however, recent EuroNCAP tests of cars with pedestrian protection bumpers show that they already fully comply with the current Directive's phase two requirements. This suggests that this lower level of protection is not needed.

ETSC recommends that the 250g relaxation zone is removed.

B Other issues

1. Exemptions

Exemptions of vehicles with accident avoidance technologies is inappropriate. Pedestrian protection measures on cars are there for when a collision occurs. Collision avoidance technology will (hopefully) reduce the number of collisions but it will not eliminate them all as in many cases pedestrians run or walk into the road when it is too late to avoid a collision. In the cases where accident avoidance systems are able to reduce the impact speed it will compliment but do not replace the need for pedestrian protection by vehicle deformation. For car occupants, protection levels have been set to provide protection for a much higher proportion of potential casualties than the current pedestrian Directive. Unfortunately the level of pedestrian protection that can be provided by improvements to the vehicle's front cannot match occupant protection for a number of reasons; principally due to the feasibility of providing sufficient crush depth to protect above 40 km/h. Providing pedestrian protection by vehicle deformation above this speed becomes rapidly more onerous. Measure that in some cases can prevent the impact or reduce the vehicle's speed before impact such as accident avoidance systems should be used to increase the proportion of pedestrians protected, not as a reason to remove protection.

Nobody suggests that speed limits could be raised for cars offering pedestrian protection or where high friction road surfaces exist, as these would compensate for other protection measures so why should accident avoidance be treated differently? Casualty reduction requires the application of different measures that are able to compliment each other, rather than replace, so providing increased protection.

ETSC believes that the provision of accident avoidance technologies should have no influence on the requirement to provide pedestrian protection. Hopefully, they will increase the relatively small proportion of pedestrians for whom protection can be provided.

2. Timing for implementation

If the Regulation were to come into force in January 2009 the implementation of the diluted Phase two would be delayed by three years compared with the dates in the current Directive, see Table 1.

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ETSC sees no reason for delaying the implementation of tests for which the car industry has had sufficient time to prepare, unless the current EC proposal is significantly improved. However, the longer timescale proposed by the European Commission would be acceptable, if all of ETSC's proposals were taken into account.

Table 1 Timings assuming regulation comes into force in January 2009
(Dates for New Type Approvals / All new Cars)

Vehicles	Directive		Draft Regulation		
	Phase one (year)	Phase two (year)	Phase one (year)	Phase two (year)	BAS (year)
M1 ≤ 2500 kg and N1 derived from M1 ≤ 2500 kg	2005 / 2012	2010 / 2015	Oct 2009/ Jan 2014	Sept 2013 / Sept 2018	Oct 2009 / Oct 2011
M1 > 2500 kg	-	-	-	July 2015 / July 2020	Oct 2009 / July 2015
N1 other (not derived and/or >2500 kg) but excludes 'forward control' vehicles	-	-	-	July 2015 / July 2020	July 2015 / July 2015

3. Brake assist system

The proposal focuses too much on Brake Assist Technology. The UK Transport Research Laboratory (TRL), in their first feasibility study for the EC (2004), noted that whilst brake assist may reduce the severity of accidents with vulnerable road users "strictly speaking, this does not meet the above definition for complying with phase two". ETSC is therefore disappointed that the draft Regulation places so much emphasis on brake assist. This technology is already entering the market place without regulatory intervention. The benefits it offers in improved road safety should, therefore, have been additional to the measure rather than substitutive through the facilitation of the market introduction of other active technologies.

Moreover, poor estimates of the benefits of Brake Assist were used to justify watering down phase 2 of the Directive/Regulation. The calculations for the benefits made use of estimates of road friction made by the eye. These were taken from an on-the-spot accident study. The EC contractor (TRL) demonstrated that these estimates were wrong, in their second feasibility report (2006). This is why TRL called the results "indicative" in their study to determine the benefits. The EC took no account of the fact that Brake Assist is already fitted to many cars, so compulsory fitment will make little change.

Conclusion

The ETSC calls on the EP and the Council to improve the above mentioned shortcomings in the course of the forthcoming co-decision procedure. Enhancing the protection to the most populous group of road users will prevent unnecessary human suffering, injuries and deaths.

ETSC therefore urges the European legislator to stand by the proposals contained in the TRL report (2004). Indeed, to settle for any less would run against the obligations under the Treaty, notably those concerning public health as outlined in Article 152 which states that "a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities".

References

Mizuno Y (2003). *Summary of IHRA pedestrian safety WG activities (2003) – proposed test methods to evaluate pedestrian protection afforded by passenger cars.* Proceedings of the 18th international technical conference on the Enhanced Safety of Vehicles, Nagoya Japan, 19-22 May 2003. Washington DC: Department of Transportation, National Highway Traffic Safety Administration, NHTSA (available on NHTSA website - www.nhtsa.dot.gov).