

Developing a consumer safety rating for Heavy Goods Vehicles

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ABSTRACT

In 2024, Euro NCAP applied a consumer rating scheme to assess the safety of heavy trucks aimed at long haul freight for the first time. In 2025, this was followed up with an extension to rigid long haul variants of the same tractor units and the testing of vehicles aimed at a new sector (18 tonne rigids for regional distribution). Industry are allowed to submit updated and improved vehicles for testing at any time.

Consumer rating schemes are by their nature voluntary and rely heavily on making ‘safety sell’ to allow vehicle manufacturers to invest more in safety, with confidence of a return on that investment. The factors driving purchasing decisions in the HGV market are very different to that of private cars, and how both the freight and vehicle manufacturing industries would respond remained uncertain. The objective of this paper was to review the early results of the Euro NCAP HGV testing to-date. This was intended to provide a first objective benchmark of how truck safety varies between different manufacturers and how well manufacturers have responded to the rating. It will also highlight the technical safety areas that will be affected by the response as well as giving an indication of where future development will be targeted.

INTRODUCTION

In Europe, Heavy Goods Vehicles (GVW>3,500kg, aka trucks), represent c1.5% of registered vehicles, c6% of traffic (vehicle km), c 6% of all road casualties but around 14% of road fatalities [1]. In short, they are:

- used more intensively than passenger cars, increasing each vehicle’s exposure to risk
- under-represented in collisions of all severities, likely strongly influenced by more of their usage being on the safest types of roads (e.g. Motorways)
- strongly over-represented in the most severe types of collision, likely influenced by their size and weight

Unlike passenger cars, the use of HGVs is almost entirely linked to servicing an economic need. There is no leisure use, the use of online meetings cannot be deployed to reduce the need for travel and the scope for modal shift is more limited than it is for passenger transport. Freight demand tends to increase with increasing population and increasing prosperity. As such, the safety risks associated with the use of HGV would be likely to grow in societies doing well, if no other actions to mitigate risks were taken.

Euro NCAP has adopted a ‘Vision Zero’ approach to road safety and as such, it has been recognised that Zero will not be reached without action across all types of road vehicles. In 2020, Euro NCAP started its technical working group on ‘commercial vehicles’ collectively. This group delivered a rating scheme for vans in 2022, which has been the subject of a previous paper [2]. In 2024, a rating scheme for HGVs (in excess of 3.5 tonnes gross weight) was delivered, and the rationale and development was also described in detail in a previous paper [3].

The aim of this current paper is to assess the effect that the rating has had on the industry and to examine where it might develop in future to increase that effect.

EURO NCAP HGV TESTS & ASSESSMENTS

The overall rating scheme

At the time of the previous paper [2] describing the rationale and technical development of the scheme, the technologies had been identified where Euro NCAP had found evidence of potential casualty benefits and technical feasibility for industry. However, the assessment protocols and details of how the scores could be achieved had not yet been defined.

The rating scheme was developed in order to be as harmonised as possible with the car scheme at the highest level. As such, it adopted a new rating structure in 2024, which was due for adoption in 2026 in the car programme. The details of points allocation and technical areas are of course quite different from the car scheme, recognising that crash populations, technologies available and the means to test them can all be quite different for HGVs compared with passenger cars.

Safe Driving		Crash Avoidance		Crash Protection		Post-Crash	
Occupant Monitoring	15	Frontal Collisions	60	Frontal Impact	0	Rescue Information	90
Seatbelt usage	15	Car	35	Offset	0	Rescue Sheets	40
		Pedestrian & Cyclist	25			Rescue Guide	40
Driver Engagement	10	Lane Departure Collisions	25	VRU Impact	0	External Labelling	10
Driver Monitoring	10	Lane Departure	15	Head impact	0	Post-Crash Intervention	5
		Car	10	Pelvis & Leg impact	0	Advanced eCall	5
Vision	50	Low Speed Collisions	15			Vehicle Extrication	5
Direct Vision	35	Cyclist Nearside Turn	15			Energy Management	5
Indirect Vision	15	Pedestrian Moving Off	0				
Vehicle Assistance	25	Reversing	0				
Speed Assistance	15						
ACC Performance	10						
	100		100		0		100

Figure 1: 2024-2028 stages of a crash rating structure and points allocation

The overall star rating of a vehicle is determined by the score in the pillar with the lowest number of points (excluding crash protection for now because no measures are yet tested). In passenger cars, where the industry have been working with Euro NCAP for a long time, this approach reflects maturity where most manufacturers are addressing most feasible areas of safety. However, for HGVs the rating is new and up until 2024, industry had developed different approaches to safety (for example, some prioritising safe driving, others prioritising crash avoidance). As such, a ‘soft landing’ was considered necessary. The threshold for achieving 5 star was kept the same as for passenger car, but the points boundaries for lower awards were wider such that recognition begins with a significantly lower points total than for passenger car. The HGV boundaries are:

- 5 star ≥ 80
- 4 star ≥ 65 and < 80
- 3 star ≥ 50 and < 65
- 2 star ≥ 35 and < 50
- 1 star ≥ 20 and < 35
- 0 star < 20

For both passenger car and HGV a ‘points swap’ system is permitted to allow some flexibility in the rating for those that have prioritised different approaches. This means, for example, that if a manufacturer scored more than the 80 points needed to attain 5 stars in safe driving but less than the 5 star threshold in crash avoidance, then the vehicle at a basic level might be awarded only 4 stars. However, with the points swap approach, it may be possible to ‘top up’ the crash avoidance total with the ‘spare’ points from exceeding the threshold in safe driving. In the passenger car rating only 5 points may be transferred. In the HGV scheme, a more generous 20 points can be transferred. Transfers are only possible between adjacent pillars and no transfers to or from post crash are permitted.

One aspect of the HGV rating is unique amongst Euro NCAP’s scheme: The Citysafe Award. This recognises that cars and vans are used in similar patterns across different road types and each vehicle can generally be used anywhere on the road network. The use of HGVs is distributed differently across the road network, with a higher proportion of truck miles on motorways and major inter-urban routes. Some trucks may be bought as ‘general purpose’ machines for flexible use on ad-hoc contracts across a broad sector (e.g. long haul). These will access all road types where they are legally permitted (e.g. subject to local width, height and weight limits) and tractor units may work in cities, rigids may spend significant miles on highways. However, others may be

bought very specifically to service one specific contract for a long period of time. This means that some smaller rigid vehicles may be bought for exclusive use on a distribution contract for which almost all of the distance travelled is in a dense urban environment. Other tractor units may be bought for a contract that is 99% motorway use, and never in its working life enter a city environment.

The CitySafe award allows 'general purpose' tractor units that are better suited to occasional city use to be identified by buyers and the clients that they serve. It also allows vehicles intended solely for city use to still be recognised as achieving safety excellent for their purpose, even where they cannot achieve 5 stars because for example, they don't have a lane keeping system. To achieve the 'citysafe' award, then a vehicle must achieve at least 50% of the available points for Vision (direct and indirect), AEB pedestrian and cyclist and the cyclist nearside turn.

The individual test & assessment areas

Details of the tests and assessments are published in Euro NCAP protocols [4] so will only be briefly summarised here as contextual information of what manufacturers need to do to score well in the assessment:

- **Seat belt usage:** Seat belt reminder is very similar to passenger car protocol from 2023, requiring a 'loud and clear' warning for longer than is required by Regulation. It has been adapted to assign 9 points for the driver's seat and then divide 6 points among however many passenger seats are in the vehicle.
- **Driver Monitoring:** 5 points are awarded for compliance with GSR DDAW requirements, and an additional 5 points if either
 - Sensitivity exceeds 50% AND false positive rate is less than 1 every 4.5 hours; OR
 - An innovative attention function over and above information and warnings is provided (for example, a 'safe stop' function when an unresponsive driver is detected).
- **Direct Vision:** Assessment is based on the definition of total visible volume in a zone around the cab, as required by UNECE Regulation No 167. R167 requires the worst-case variant of a long haul vehicle to achieve a minimum 7 m³ of visible space from 2029. Euro NCAP will assess a 'best selling' variant (typically a lower eye point than worst case) and award the 35 points on a non-linear sliding scale from 5m³ to 21m³.
- **Indirect Vision:** This is intended to reflect the advantages that camera monitor systems can have in terms of reducing driver workload (fewer locations to look, less image distortion or better orientation of image) and field of view. Currently implemented as a feature count depending how many R46 compliant views are available via CMS, whether or not they replace or supplement mirrors and any innovative features (such as dynamic views that change in response to driving circumstances, enhanced night vision etc). Up to 12 points are available for the main CMS views with 3 points available for innovative features
- **Speed Assistance:** is very similar to earlier generations of the passenger car protocol. The Speed Limit Information Function (SLIF) can score up to 7.5 points if it responds to HGV specific limits and a range of conditional speed limits and update requirements etc. However, it does not yet consider local hazards and requires only a short 100km test drive to confirm. A further 7.5 points are available for speed control functions, which can be generated from the same systems as passenger cars but also from downhill speed controls or geo OEM submitted information.
- **ACC performance:** ACC ensures that drivers follow a safer distance behind vehicles than may otherwise occur and can enable earlier intervention in front to rear collision circumstances where AEB would also intervene. The assessment awards 3 points for close following information for the driver and 7 points where driving with ACC active results in better collision avoidance potential than AEB alone.
- **Frontal Collisions – Car:** Builds on UNECE Regulation 131 by seeking performance at higher and lower speed (90 km/h / 10 km/h) for full points as well as for performance in offset collisions where 50% of the width of the car overlaps with the truck structure. Performance when a lead vehicle brakes is also tested. AEB performance can achieve 31.5 points, but the total will be reduced by 25% if the AEB is deactivated by small driver inputs during the test. The remaining 3.5 points are for ensuring manual driver deactivation of AEB requires a complex process and the AEB is automatically reactivated.
- **Frontal Collisions - Pedestrian & Cyclist:** This protocol requires fitment of AEB before it will be required by Regulation 131 (2028 at best) and requires performance in additional areas. It is similar to earlier generation passenger car protocols with all crossing and longitudinal scenarios included. It considers test speeds up to 50 km/h rather than 60 km/h reflecting differences in crash data and fundamental limitations in airbrake pressure buildup time and commercial tyre grip. Performance in

pedestrian tests can accrue 17.5 points, cyclist tests can achieve 5 points and 2.5 points are available for meeting deactivation and reactivation criteria. Night and cornering tests are not yet included.

- **Cyclist Nearside Turns:** This test builds on the information and warning systems required from 2024 for UNECE Regulation No 151 but adds a requirement to intervene either to avoid collision, or at least to avoid runover by the wheels of the vehicle. A total of 24 scenarios are considered and 1 point is achieved for collision avoidance, 0.75 points for preventing runover but not impact. Performance is not required in all scenarios to achieve the maximum 15 points, recognising the early stage of development of this system and that OEMs have taken different approaches where relative effectiveness is not yet fully known.
- **Lane Departure collisions - Single Vehicle:** Also modelled on previous generation of car protocols, the truck protocol is adapted to account for the greater vehicle width, which limits the maximum lateral speeds that can be achieved in lane. Trucks also tend to permit greater deviation from the lane before intervention than cars because the greater width means there is less ‘tolerance’ between normal variation in lateral driving position and the truck leaving the lane, which makes a more difficult trade off-between true and false positive performance. Full points in each scenario are achieved for lane departures of 0.3m or less and half points if the lane departure is between 0.3 and 0.5m. The likelihood of secondary lane departure after an initial course correction is assessed, as well as complex deactivation and any innovative features that promote improved driver acceptance. These are worth up to 3 points of the 15 available.
- **Lane Departure collisions – Car:** this also closely follows earlier car protocols and integrates with the single vehicle. A point is awarded for avoiding each collision scenario.
- **Rescue Sheets & Rescue Guide:** These are almost identical to the passenger car requirements, adapted to account for different symbols and vehicle layouts etc. The rescue sheets provide a short, standardised and mainly pictorial fast guide to fire fighters on route to a collision and must be accessible via the Rescue App. The Emergency response guide allows for more detailed consideration of a wider context.
- **External Labelling:** This is slightly different to passenger car because it does not require front and rear labelling of the cab itself to identify in a standard form whether a truck is diesel, battery electric or alternatively fuelled. It was considered that all electric trucks are very clearly distinguished as this time by their marketing on the cab and legislation on this is considered imminent. The labelling that must be present is to allow firefighters to identify quickly where they need to cut high voltage supplies.
- **Advanced e-call:** Placeholder for the future, points not needed for 5 star, technical requirements not yet defined
- **Energy Management:** Placeholder for the future, points not needed for 5 star, technical requirements not yet defined

RESULTS

In 2024 Euro NCAP assessed 9 models of 4*2 tractor units intended for 40 tonne operation in the long haul sector, from the 7 main European truck makers. The results are shown in Figure 2, below.





Make	Model	Rating	CitySafe
DAF	XF	★★★★☆	
IVECO	S-Way	★★★☆☆	
MAN	TGX	★★★★☆	
Mercedes-Benz	Actros L	★★★★☆	
Renault Trucks	T	★★★★☆	
Scania	R-series	★★★★☆	
Scania	G-series	★★★★☆	
Volvo	FM	★★★★★	
Volvo	FH Aero	★★★★★	

Figure 2: Results of the long haul tractor tests, November 2024

It can be seen that almost the full range of possible results were achieved, from one star to 5 stars. Only 4 models from 3 manufacturers achieved the CitySafe rating. The latter is hardest to achieve in the long haul sector where large powerful engines and flat floor designs in the cab for driver comfort on overnight stays tends to produce a high driving position which is poor for direct vision near the cab.

Compared with expectation before the test, the collective was better than thought. During research to develop the test procedures through 2023, it was, for example, apparent that only one manufacturer (Daimler) offered AEB for pedestrians and cyclists on any of their trucks. By the time of the official testing in the late summer and autumn of 2024, all but one manufacturer offered that important system. A range of different performance was identified from different brands with only 3 models achieving performance categorised in the top performance band of ‘good’ but this represents a very rapid and major improvement in the market in the space of a year. In addition to the introduction of Euro NCAP’s rating, this step change will have been influenced by the UNECE regulatory development for the future, as well as the opportunity for major change because of other new items for the EU’s General Safety Regulation. It is important to remember though that any vehicle that only complied with the minimum standard set by the GSR in 2024 would achieve zero stars in the Euro NCAP rating.

In early 2025, Euro NCAP aimed to assess equivalent rigid versions of the same models of HGV in the same long haul segment. Although tractor semi-trailer combinations are the dominant configuration across Europe, there are countries where rigid vehicles towing drawbar trailers are more common so these are also very important. It also provided an opportunity for Euro NCAP to consider how much difference simple configuration changes such as different wheelbases, slightly different unladen weights, or more axles would make to the measured safety performance.

Even though these assessments were made only around 9 months after the first round, several manufacturers requested that new vehicles or updated performance was also assessed alongside the new configurations. The results are shown in Figure 3, below.

Make	Model	Rating	CitySafe
DAF	XF	★★★★☆	CitySafe
MAN	TGX	★★★★☆	
Mercedes-Benz	Actros	★★★★★	CitySafe
Mercedes-Benz	Actros F	★★★★☆	CitySafe
Mercedes-Benz	Actros L Procab	★★★★☆	CitySafe
Renault Trucks	T	★★★★☆	CitySafe
Scania	R-series	★★★★☆	
Scania	G-series	★★★★☆	CitySafe
Volvo	FM	★★★★★	CitySafe
Volvo	FH Aero	★★★★★	CitySafe

Figure 3. Results of the long haul rigid tests, September 2025.

The tests showed that where the specification remained the same but the wheelbase increased and the axle configuration changed from 4*2 to 6*2, then the measured performance did not meaningfully change, just small percentage differences in some scores, not moving systematically in one direction. This form of analysis will be monitored over future tests to develop confidence in what variables may or may not have an effect and may allow greater extension of test results in the future to cover more variants.

It was even more notable that several manufacturers significantly improved performance over this short time. Scania improved the R-series from a 3 star to a 4 star. Renault added the CitySafe rating to the already impressive 4 stars it gained previously. Daimler increased the Actros from a 3 to 4 star and added the CitySafe award. They also had two more trucks rated, with the ‘Procab’ Variant achieving the same as the L and the slightly lower Actros achieving the full 5 stars and city safe.

By the time this paper is presented at conference, at least one more round of results can be added, looking at regional distribution trucks. These are classed as two axle rigid vehicles, with a shorter wheelbase than their long haul cousins, and rated to a maximum authorised mass of 18 tonnes for cross border use in Europe (this can be increased to 20 tonnes for BEV). City distribution trucks (up to 12 tonnes) will be rated in the Autumn of 2026 and construction vehicles (for example, 4 axle rigid tippers at 32 tonnes) will be rated in 2027. Additional vehicles across different sectors will be added in interim releases where new market entrants or those existing manufacturers with new models wish to rate a vehicle not yet covered by our Members.

FUTURE DEVELOPMENT

Quantifying the effectiveness

The change in the market for HGV safety since 2023 has been enormous, both from the point of view of the ADAS measures required by the General Safety Regulation, and the additional systems deployed voluntarily by manufacturers, with the encouragement and market assistance of the Euro NCAP rating. Such a step change in a short time provides a rare opportunity to scientifically study the effectiveness of the intervention in multiple ways.

Euro NCAP and/or its Members will explore the possibility of a study of the effect in terms of casualty rates. This will only become possible in a few years' time when the new vehicles have penetrated the market to a sufficient extent for casualty data to be available from the full range of different performing vehicles, pre-GSR, GSR & Euro NCAP rated from 1 star to 5 star. However, there may be some significant challenges still, in executing such a study. Serious and fatal casualties from collisions involving HGVs are only a fraction of those from passenger cars so the statistical power of any analyses is immediately substantially less than any similar study of passenger cars. This exacerbates the universal difficulty in Europe of the lack of a detailed set of collision data that is consistently coded across all the different European Countries, which often limits sample sizes to individual nations. A further complication in this case is that while the GSR technologies will be required on all vehicles, Euro NCAPs first iteration awards manufacturers that make the technology available even if they are only optional fit. This can make it difficult to establish both in exposure data (vehicle registrations, or vehicle kms) and collision data what the real performance of the fleet is.

An important component of effectiveness will also prove to be the acceptance by professional truck drivers of all this new technology. The fact that at least one manufacturer could achieve 5 stars even in the first round of testing, when they did not have access to finalised protocols until quite late in the process, suggests that at least those first generations will have mainly been designed to a level of sensitivity and false positive risk that manufacturers were comfortable with. The influence of Euro NCAP in the 2024 results would be limited because there would not have been time for manufacturers to retune or redesign systems to 'chase stars' at the cost of driver acceptance. As such, it was considered that the level of challenge posed to the industry is likely to have struck the right balance. However, the step change in technologies, and the inclusion at a similar time of the GSR technologies, which mandated a series of audible warnings (ISA, Blind Spot Information Systems, Moving off Information Systems), equally provides an opportunity to study driver acceptance. Euro NCAP will look to work with fleets to try to measure in the real world how often drivers switch systems off, how they react to them and whether there are differences between different brands offering different approaches.

Protocol development along the Roadmap

Euro NCAP has committed to updating the rating for technical progress every three years, so that the next major upgrade is due in 2028 and subsequently in 2031. An overview is provided in Figure 4, below.

Technologies and Potential Introduction Timeline

Common crash types involving HGVs and other road users	Near Term(2024)							Mid Term(2028)					Long Term(2031)					
	Speed Assistance	Indirect OSM	AEB Vehicle front to rear	Lane Support	AEB VRU	Vision	AEB Nearside turn	On Road Evaluation	Direct OSM	Active MOIS	AEB - PTW	AEB - TAP	Trailer and Body Builder	AEB Reverse	AEB Head On	Passive Ped Protection	Crash Compatibility	Occupant protection
VRU crossing	●				●			●								●		
Stationary or walking VRU	●			●	●			●								●		
VRU in collision with low-speed manoeuvring truck						●	●	●		●								
VRU in collision with reversing HGV													●	●				
PTW rider in collision with HGV	●	●				●		●	●		●	●						
Car occupant in collision with HGV	●	●	●	●		●		●	●			●	●		●		●	
HGV occupant in collision	●	●	●	●				●	●					●			●	●

Standard Fit?

Before the new items highlighted above are considered, Euro NCAP also intends to evolve the existing protocols already implemented in 2024. The detailed protocols for these are due to be delivered to industry by the end of 2026 so the exact content under consideration could not be defined at the time of writing. However, at the end of 2025, the possibilities under consideration were:

- **Seat belt usage:** Upgrading requirements to identify ‘misuse’ scenarios, for example where a driver might fasten a belt behind their back, silencing the seat belt reminder without gaining the benefit of a belt.
- **Direct Vision:** No change to principles or method of measurement but consideration of amending the scoring to ensure that no reward is gained for vehicles with vision less than will be required by regulation for long haul trucks from 2029 (7m³). This could be a change to the whole range, which would mean scores for vehicles already exceeding 7 m³ may reduce, or could be a simple step to maintain scores for those vehicles and simply reduce to zero the scores for those between 5 and 7 m³.
- **Indirect Vision:** There is an intention to move from a simple feature count towards more of a performance measurement approach.
- **Speed Assistance:** Considering the addition of ‘local hazards’ as implemented in more recent car protocols but potentially also HGV specific features such as curve speed information to warn the driver of a risk of rollover if they approach a bend at a speed that is too high.
- **ACC performance:** Some OEMs report very high usage of ACC amongst professional truck drivers and, where available, those SAE level 2 systems offering both lateral and longitudinal control on a continuous basis. Euro NCAP is considering whether the assisted driving grading could be transferred in whole or in part to HGVs.
- **Frontal Collisions – Car:** This is the longest established ADAS technology currently in the truck rating and simplifications may be considered to minimise test burden. However, in addition to this, the possibility of adding ‘robustness’ layers such as the use of different targets is also under consideration.
- **Frontal Collisions - Pedestrian & Cyclist:** Although collisions between trucks and pedestrians in darkness are less of a priority than they are for equivalent passenger car collisions, a substantial number do still occur, particularly in the longitudinal scenarios. Adding night time performance is under consideration.
- **Cyclist Nearside Turns:** As an emerging technology, this is being kept under close review, but no proposals intended to significantly increase the performance of systems are yet under consideration.
- **Lane Departure collisions:** The addition of road edge responses and ELK that is sensitive to powered two wheelers is under consideration, as well as any additional measures that could be identified to improve driver acceptance.

In addition to the above, it is currently proposed to begin On-Road Assessment for HGVs, similar to the scheme introduced on passenger cars in 2026. Strict rules on freight operator licensing in Europe as well as a patchwork of diverse rules on exemptions for testing may limit this to on-road testing in one country per laboratory for HGVs. However, the application and intention would be the same. An extended drive with considerable implementation can directly improve the evaluation of Speed Assist technologies and begin to quantify accuracy. It can also begin to look at questions of excessive false positives either directly or by providing evidence for future protocol changes.

Direct driver monitoring systems that are capable of identifying distraction as well as fatigue and impairment will be required as part of the general safety regulation by 2026. For 2028, Euro NCAP will consider the extent to which additional requirements over and above regulated minima that have been introduced in the passenger car rating can be migrated to HGVs. In particular, Euro NCAP will examine the potential for links between driver monitoring and other ADAS to allow higher true positive performance where drivers are not attentive, while simultaneously reducing false positives where they are attentive.

Moving off information systems provide information signals (visual only) whenever a pedestrian is crossing in front of a stationary truck and is potentially in a blind spot. While expected to reduce how often collisions occur when the driver moves off from rest in those circumstances, there are concerns that it will not eliminate them. The information signal is expected to activate frequently, which is why it cannot be an audible system which would be annoying in the many situations where the driver was aware of the VRU presence. However, visual signals are less alerting when they are genuinely needed, particularly if the driver is not paying full attention and/or where they are so frequent that they can become ‘wallpaper’ in the background. Euro NCAP plan to introduce a requirement for the motion of the vehicle to be actively inhibited in this situation. This could be implemented by suppressing the throttle, or potentially by active braking if there is some initial movement, with details and the possibility of override systems still to be confirmed.

In passenger cars, AEB that activates to prevent one car from turning across the path of oncoming traffic is seen as a very important safety mechanism in a crash type that causes many casualties. These are based on evolutions of the forward looking sensor sets that are already in use on HGVs to address frontal collisions and so, they are considered feasible for at least the leading HGVs during the 2028-2031 time frame. However, preliminary crash data suggests that in HGVs that crash mechanism is of lower priority than it is for passenger cars and that when it does occur, powered two wheelers may be as relevant, if not more relevant, than passenger car casualties.

In the post crash pillar, then it is notable that Volvo in the USA has now released an eCall function [5]. At the time of writing, none are available in Europe. However, it is considered feasible that at least the 112 eCall system could be implemented by manufacturers in Europe within the 2028-2031 timeframe. The details of how many of the advanced features required in the passenger car market are relevant and feasible for trucks are under discussion, as well as whether any features specific to trucks (e.g. details of trailers or loads) could be feasible.

Energy management & extrication are also under discussion. Some of the energy management measures will undoubtedly be relevant to battery electric trucks as they begin to enter the market more widely, and the stored energy levels will be much higher than in the car market. However, not all requirements may be relevant and in extrication particularly, there will be quite different techniques and priorities. The details of the exact content remain under discussion.

In the roadmap document [6] published in 2022, and in most discussions since, crash protection measures have been allocated as an upgrade for 2031 ratings. This is for many reasons, including:

- Fundamental difficulties with managing large collision energies
- The long lifetime of cab body in white designs and tooling in the HGV market making structural change difficult,
- The absence of generally accepted test procedures, requiring Euro NCAP to start from a blank sheet of paper in terms of development, and
- The reliance in some cases on structures being put in place by a third party manufacturer rather than the truck OEM (i.e. a body builder, or a trailer maker).

However, it is also problematic in many ways. All manufacturers in the European Truck sector have taken action voluntarily on safety but the areas in which they have focussed has varied. Those that have placed a lot of focus on crash protection measures may, so far, feel that they do not get fair reward for their efforts in the Euro NCAP rating. As such, research and consultation is underway to examine whether interim measures may be possible in the 2028-2031 time frame.

CONCLUSIONS

In 2024, Euro NCAP completed development of the worlds first consumer rating scheme for Heavy Goods Vehicles and published the first results concerning long haul tractor units. The results showed that there was substantial variation in the safety performance of the vehicles in the fleet. However, with the scoring system set such that minimum compliance with the latest 2024 General Safety Regulations would achieve zero stars, it also showed that all the mainstream markets offered more than the bare minimum, and substantially more than was available just one year before in 2023.

It remains too early at this stage to scientifically measure the effects of the rating in terms of casualty benefits or even in safety proxies or driver behavioural change. However, the second set of results released in 2025 clearly shows an excellent market response. Two new models were added to the rating voluntarily by manufacturers, and 3 more models improved their rating from the first launch.

The scheme will continue to rate other vehicles in the HGV sector including Distribution, Construction and Utility trucks on an annual basis and a published roadmap for future 3 yearly updates continues to encourage yet higher safety levels on HGV's.

This excellent response is extremely encouraging and all the signs from industry are that it will continue. As such, Euro NCAP has committed to ongoing development of the rating to continue improving truck safety over the years to come, with significant upgrades scheduled for 2028 and for 2031.

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