

**Euro NCAP**

**RATING REVIEW**

**2023**



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# Preface

This document explains how the strategic elements from Euro NCAP's "Vision 2030" roadmap will be included into a new overall rating scheme for passenger cars and outlines the performance standards for each star level from 2026 onwards.

The Euro NCAP Rating Group produced the rating scheme, its contents and the rating thresholds between mid-2022 and late-2023. The final version was formally approved by the Board of Directors in December 2023.

# Abbreviations

ACC	Adaptive Cruise Control
AD	Assisted Driving
AEB	Autonomous Emergency Braking
AES	Autonomous Emergency Steering
COP	Child Occupant Protection
CPD	Child Presence Detection
CRS	Child Restraint System
DMS	Driver Monitoring System
eCall	Automatic crash notification system
ERG	Emergency Response Guide
GSR	General Safety Regulation
HBM	Human Body Model
LSS	Lane Support Systems
PTW	Powered Two-Wheeler
SAS	Speed Assistance System
SBR	Seat Belt Reminder
SLIF	Speed Limit Information Function
SCF	Speed Control Function
V2v, V2x	Vehicle-to-vehicle, Vehicle-to-everything Communication
VRU	Vulnerable Road User
VSSTR	Vehicle Specification, Sponsorship, Testing and Retesting (protocol)

# Introduction

## Background

Euro NCAP's most recent strategic plan Vision 2030 "**A Safer Future for Mobility**" was presented for the first time in November 2022. The document covers a range of cutting-edge automotive technologies that have recently entered the European market that will increase the safety of motorists and other road users. To further reduce injuries and fatalities from traffic accidents, it is crucial to ensure the availability of these safety systems across all vehicle segments, improve their technical capabilities, and raise public knowledge about their relevance.

Safety systems need to have a proven record, so that road users can feel confident about their effectiveness. With Vision 2030, Euro NCAP continues the strategy taken in recent years but is delivering fresh impetus to its mission. A new overall safety rating will encourage more robust, user accepted systems that support safe driving – whether manually or assisted – prevent collisions with other road users, and mitigate the effects of unavoidable collisions on car occupants of all sizes and gender as well as vulnerable road users. Furthermore, it reflects the organisation's continued efforts to improve post-crash safety and support critical rescue services.

To help develop and facilitate the market for safety, Euro NCAP's role is to recognise and reward the vehicle industry's innovators and early adopters. Vehicle manufacturers decide on technical solutions and how to introduce efficient countermeasures. The roadmap's timeline outlines the timeframe during which Euro NCAP anticipates that new and improved technologies will reach the market and be ready for testing as part of the rating scheme. Requirements and the presented timeline are based on Euro NCAP's current understanding of the market and assumptions about how technology and regulations will evolve. However, these assumptions might be, or eventually become, invalid, which may lead to adjustments to the rating scheme in the years to come.

## Objectives

The Ratings Group reconvened in 2022 to lay out the specific rating scheme based on the Vision 2030 roadmap proposals. Euro NCAP will continue to issue overall star ratings for passenger cars based on a compilation of relevant safety tests and checks; however, the current four box system will be phased out and replaced by a new rating methodology in 2026. The new scheme clusters tests according to the four distinctive stages of an accident: safe driving, crash avoidance, crash protection and post-crash safety (based on the Haddon matrix<sup>1</sup>).

With this approach, Euro NCAP intends to make a clearer distinction between the role of various safety features and put a larger emphasis on the effectiveness, robustness, and customer acceptance of driver aids, including assisted and automated driving functions. It allows for testing of the relevant functions contributing to each accident stage, but also acknowledge the benefit of technology integrating the stages by creating links between them on a protocol and scoring level. To deliver on these objectives, new ways to assess safety functions are deployed, such as virtual testing and on road evaluation.

Due to the uncertainty surrounding the evolution of the content, the effects of future revisions of the General Safety Regulation (GSR), and the development of automated driving systems, it was decided to focus on the rating for the period 2026 to 2028. As part of the exercise, the group assessed the Euro NCAP rating system to date, including the modifications already proposed by the various working groups, and suggested a justification for adding additional items and backstops. Thresholds were established for each star level using test results of recently rated cars and predictions of performance. However, as only a small number of cars has been evaluated against the 2023 protocols to date, several assumptions were made. This means that some minor corrections to the numbers in this report may still be required in the upcoming period.

<sup>1</sup> Peden, World Health Organization. Ed. by Margie (2004).  
World report on road traffic injury prevention.  
Geneva: World Health Organization. ISBN 9241562609.

## Guiding Principles

Achieving the roadmap depends on industry engagement and thus on the stability and feasibility of the rating requirements. For that reason, these principles have been crucial in guiding the development of the new scheme. To avoid a too-radical impact on the overall stars of future car models, the current rating scheme has been transformed into the new rating method by regrouping the existing elements and recalculating and adjusting the points for each test. In most cases, this transition could be applied to complete protocols, however in the case of child safety, the existing assessment elements have been distributed over different stages.

In the next step, new content has been added, including, a “soft” link to assisted driving systems. This link takes the form of a penalty for poor driver engagement (for standard or optional systems) and points for vehicle longitudinal and steering assistance (for standard systems) under Safe Driving. The motive behind this connection is the potential safety benefit, but also the associated risk of assisted driving systems that rely on driver oversight. The assisted driving gradings for optional systems will, for the time being, remain complementary to the overall rating and continue to be published separately from the star rating.

The basic principle of the new rating is like the current system in that a vehicle must obtain a minimum score in each of the stages to qualify for an overall star level. This implies that the number of stars given to the vehicle depends on which of the stages received the lowest score. A unique feature of the new rating scheme, however, is that some compensation is allowed between the first three stages, reflecting how in real-life safety technology acting in adjacent stages can address similar accidents or injuries. This makes the rating more stable and offers manufacturers some additional flexibility and a soft landing. Finally, some backstop mechanisms have been included to avoid unwanted side effects, such as rewarding 5 stars to vehicles where a life-threatening injury risk was observed during the assessment. This is the already proven regulation on the "red body regions" from the current rating system.

The new system is expected to be sufficiently flexible to accommodate new tests and effectively drive improvements in the vehicle fleet by continuously reviewing the requirements on a protocol level. Euro NCAP has adopted a three-year update cycle, that provides more time for the development of protocols and test equipment for Euro NCAP and as well as more time to vehicle manufacturers to adapt to changes in the rating. The dual rating policy is less applicable because of these lengthier lead times and consequently the decision has been taken to not actively pursue an extension of the policy for the time being.

# Rating Plan for 2026-2028

Unless otherwise noted, all tested safety equipment needs to be installed as standard throughout the Euro NCAP Application Area for a vehicle to be eligible for scoring under the new rating system. See the “Vehicle Specification, Sponsorship, Testing and Retesting” (VSSTR) protocol for more information about test variants and fitment requirements.

## Rating scheme

An overview of the rating scheme and points allocation is given in the table below. Each of the stages is given a weighting factor, however this is used solely to calculate a weighted average score used for the annual Best in Class ranking. The overall rating is calculated based on balance thresholds as explained below.

### Points Allocation (2026-2028)

Safe Driving		Crash Avoidance		Crash Protection		Post-crash Safety	
<b>Occupant Monitoring</b>	<b>30</b>	<b>Frontal Collisions</b>	<b>60</b>	<b>Frontal Impact</b>	<b>40</b>	<b>Rescue Information</b>	<b>40</b>
Seatbelt Usage	10	Car & PTW	40	Offset	20	Rescue Sheet	35
Occupant Classification	10	Pedestrian & Cyclist	20	Full Width	10	Rescue Guide	5
Occupant Presence	10			VT & Sled	10		
<b>Driver Engagement</b>	<b>30</b>	<b>Lane Departure Collisions</b>	<b>20</b>	<b>Side Impact</b>	<b>35</b>	<b>Post-crash Intervention</b>	<b>25</b>
Driver Monitoring	25	Single Vehicle	10	Barrier	15	Advanced eCall	20
Driving Controls	5	Car & PTW	10	Pole	10	Multi Collision Brake	5
				Farside	10		
<b>Vehicle Assistance</b>	<b>40</b>	<b>Acceleration Prevention</b>	<b>20</b>	<b>Rear Impact</b>	<b>5</b>	<b>Extrication</b>	<b>35</b>
Speed Assistance	20	Car & PTW	10	Front Seats	4	Energy Management	20
ACC Performance	15	Pedestrian & Cyclist	10	Rear Seats	1	Occupant Extrication	15
Steering Assistance	5						
				<b>VRU Impact</b>	<b>20</b>		
				Head Impact	10		
				Pelvis & Leg Impact	10		
<b>Weight: 20%</b>	<b>100</b>	<b>Weight: 20%</b>	<b>100</b>	<b>Weight: 50%</b>	<b>100</b>	<b>Weight: 10%</b>	<b>100</b>

Note: Backstop mechanisms may apply.

# Rating Plan for 2026-2028

## Balance thresholds

A vehicle must achieve the necessary points score in each stage to be eligible for a certain star rating. For this purpose, balance thresholds are introduced. To account for sufficient lead time, the balance thresholds set for each star level include a soft landing in the first two years of introduction of the new rating scheme. This applies specifically to the Safe Driving and Crash Avoidance stages.

From 2028 onwards, the balance thresholds will become the same for each of the individual stages.

### 2026 Balance Thresholds

Star Ratings	Safe Driving	Crash Avoidance	Crash Protection	Post-crash Safety
5	60	70	80	80
4	50	60	70	70
3	40	50	60	60
2	30	40	50	50
1	20	30	40	40

### 2027 Balance Thresholds

Star Ratings	Safe Driving	Crash Avoidance	Crash Protection	Post-crash Safety
5	70	80	80	80
4	60	70	70	70
3	50	60	60	60
2	40	50	50	50
1	30	40	40	40

### 2028 (And Onwards) Balance Thresholds

Star Ratings	Safe Driving	Crash Avoidance	Crash Protection	Post-crash Safety
5	80	80	80	80
4	70	70	70	70
3	60	60	60	60
2	50	50	50	50
1	40	40	40	40

## Compensation rule

Within the first three stages, a maximum of 5 points can be used for compensation of the adjacent stage when needed. A surplus of points can only be used for compensation of an adjacent stage. In other words, Safe Driving and Crash Protection cannot compensate each other. However, a 5-point surplus in Crash Avoidance can be split between Safe Driving and Crash Protection. This rule is a new feature of the rating scheme, created primarily to improve the mathematical stability of the rating. It also reflects the fact that technology in two adjacent stages to some extent can address similar crashes in the real world.

## Extension of rating validity

From 2026 onwards, a vehicle's rating will automatically be updated with a new year stamp in the year that follows if it already satisfies the requirements for the upcoming year and therefore maintains the same rating. This effectively adds a year of rating validity, but only applies when underlying tests have not changed. Where the tests have changed, recalculation remains possible at request of the vehicle manufacturer (see VSSTR protocol).

# Rating Plan for 2026-2028

## Backstop mechanisms

Any rating system that relies on calculating the relative performance levels of cars based on a variety of tests and criteria can introduce unintended consequences. The following backstop procedures are introduced to stop this from happening. The rating approach for 2026 is new, thus not all potential drawbacks are completely recognised yet. Euro NCAP may implement other restrictions if they are deemed necessary.

## Assisted Driving

Driver supervision is essential for assisted driving systems to be used safely. A safety risk is introduced by vehicles that do not sufficiently ensure that the driver is engaged while the system is operating. Poor levels of assistance engagement will therefore be penalised under safe driving, whether such technology is offered as standard or optional. The definition of poor engagement will be based on the integration of the driver monitoring system and co-operative steering, meaning that the driver monitoring system should be linked to the assisted driving mode.

## Vulnerable Road Users

In the new approach, car front-end countermeasures to reduce injuries to pedestrians and cyclists and avoidance technologies addressing vulnerable road user crashes end up in different stages. Although both safety measures may address comparable crashes, in practise they work better together than separately.

To ensure that cooperation between passive and active safety measures is maintained in this area, a minimum of 10 points need to be scored within VRU impacts in Crash Protection to be eligible of scoring points in pedestrian and cyclist scenarios in Frontal Collisions under Crash Avoidance.

## Red body regions

As in the previous rating system, a vehicle that meets the balance criteria for a 5-star overall rating cannot have any red rated body regions after modifiers are applied. In case of a red body region as will be detailed ASSESSMENT PROTOCOL – OVERALL RATING, the vehicle is limited to a maximum of 4-stars. This prerequisite for 5-star overall ratings is applied to all official full scale and sub-system tests under Crash Protection.

# Rating Plan for 2026-2028

## Scheduled content

### Safe Driving

Safe driving covers technology that supports a car, driver, and occupants towards a safer driving experience on the road and is divided into three main elements: Occupant Monitoring, Driver Engagement and Vehicle Assistance.

#### **Occupant Monitoring**

Occupant Monitoring consists of the assessment of seatbelt reminder systems, Occupant classification systems and Occupant presence detection technology.

Seatbelt usage will incentivise smarter seatbelt reminder technologies. Euro NCAP's current front seat SBR pre-condition for Driver Monitoring scoring is removed. Under occupant classification, both airbag disabling and Child Presence Detection (CPD, direct sensing only) are covered.

#### **Driver Engagement**

Driver Engagement consists of the assessment of Driver Monitoring Systems (DMS) and general Driving Controls. Cars with standard or optional assisted driving systems, which combine ACC and Steering Assistance, are only eligible to score Driver Engagement points when the assisted engagement as per AD grading protocol is adequate, see backstops.

The assessment of Driver Monitoring Systems including driver fatigue, distraction, and impairment and has a link to Crash Avoidance (frontal and lane-change collisions). Driving Controls is a new assessment element covering the ease of using the most important vehicle controls.

#### **Vehicle Assistance**

Vehicle Assistance consists of the assessment of Speed Assistance systems, ACC Performance and Steering Assistance, aiming to support the driver during normal driving conditions.

The evaluation of Speed Assistance system (SAS) will include updated SLIF requirements, including Local Hazards warnings (cloud based and V2v/V2x), road features and extended coverage, in addition to new SCF requirements (linked to ACC).

ACC that is installed as standard equipment will be evaluated in accordance with the AD grading protocol, regardless of whether it is provided as a stand-alone feature or a component of an assisted driving system, and regardless of how driver engagement is rated. Supplementary Steering Assist functions are also assessed if fitted as standard into ACC.

### Crash Avoidance

Crash Avoidance includes advanced crash prevention technology that mitigates or avoids crashes in critical scenarios by warning or automatic interventions, named Frontal Collisions, Lane Change Collisions and Acceleration Prevention.

#### **Frontal Collisions**

The frontal collisions cover all the baseline AEB and AES scenarios, extended with robustness variations and supported by virtual testing. All pedestrian and cyclist scenarios will only be eligible for scoring when the VRU impact element under Crash Protection scores more than 10 points (see backstops).

#### **Lane Departure Collisions**

Lane Departure Collisions cover the baseline single vehicle, oncoming and overtaking LSS test scenarios extended with robustness variations and supported by on-road evaluation.

#### **Acceleration Prevention**

Acceleration Prevention is a whole new element covering technology that prevents crashes from standstill and will also include (sudden) unintended acceleration involving cars, PTW and vulnerable road users.

# Rating Plan for 2026-2028

## Scheduled content

### Crash Protection

Crash protection includes traditional crash protection systems, such as seatbelt, airbags, crash structures and head restraints, designed to mitigate injuries, named Frontal impact, Side impact, Rear Impact (Whiplash) and Vulnerable Road User impacts, from critical incidents on the road.

#### *Frontal and Side impact*

Two full scale frontal and two full scale side crash tests are used, supplemented with sled tests and virtual simulations to improve robustness and diversity. Points are allocated to child occupant protection (COP) based on dummies representing 6- and 10-year-olds in the frontal offset and side mobile deformable barrier tests. Gabarit, i-Size assessment and CRS installation are prerequisites for scoring these child protection points.

#### *Rear impact (whiplash)*

Minor amendments to the whiplash geometric head restraint assessment for front seats are foreseen, removing the un-intended penalty for smaller statures.

#### *Vulnerable Road User impacts*

The scoring scheme will be changed to incentivise improved protection in the A-pillar and roofline areas next to updates that would allow activation of deployable systems based on forward looking sensors.

### Post-crash Safety

Post crash-safety addresses the "golden hour" of emergency response by promoting Rescue information, i.e., Rescue Sheets and Emergency Response Guides (ERG), Post-crash Intervention technology and Extrication.

#### *Rescue information*

Rescue information covers updated rescue information that supports further improvements of the Euro Rescue app to allow license plate coupling.

#### *Post-crash intervention*

Post-crash intervention includes the refinement of existing elements, e-Call and Multi-Collision Braking together with some new elements like automatic activation of hazard lights.

#### *Extrication*

Extrication includes updated and additional vehicle extraction requirements related to new energy vehicles.

## Planning for 2029 and beyond

2029 and beyond, the Vision 2030 roadmap predicts additional content changes, most notably the introduction of Human Body Model (HBM) based virtual testing and connected safety systems. Although V2v and V2x technologies have the potential to improve safety for car occupants, at-risk drivers, and powered two-wheelers, their true safety benefits will not be realised until enough of the fleet's vehicles — passenger cars, trucks, PTWs, etc. — can communicate with one another and/or with the infrastructure. Even while the auto industry has a lot to gain from it, it is obvious that they are not the only ones who can make it happen. This indicates that the supply and demand paradigm typically used by more established safety technology may not apply to the path to market for safety solutions that rely on communication between vehicles and/or infrastructure.

## Member Representatives in Euro NCAP's Rating Group

Andre Seeck (Chair)	BAST	Andrea Tesio	CSI/ACI
Aled Williams (Secretary)	Euro NCAP	Volker Sandner	ADAC
Michiel van Ratingen	Euro NCAP	Max Lang	ÖMTC/FIA
Richard Schram	Euro NCAP	Joaquim Huguet	IDIADA/Catalonia
Matthew Avery	Euro NCAP	Herman Steffan	DSD/Austria
Jean Schiltz	Luxembourg	Niels Ebbe Jacobsen	ICRT
Rikard Fredriksson	STA	Ronald Vroman	ICRT
Céline Vallaude	UTAC/French MoT		

## About Euro NCAP

Established in 1997, Euro NCAP is composed of seven European Governments as well as motoring and consumer organisations in every European country

Euro NCAP provides consumers with an Independent assessment of the safety level of the most popular cars sold in Europe.

Euro NCAP has rapidly become a catalyst for encouraging significant safety improvements to new car design. We hope that when buying a new car Euro NCAP will help you choose for safety.



Mgr. Ladeuzeplein 10, 3000 Leuven,  
BELGIUM.[www.euroncap.com](http://www.euroncap.com)