



FIX All on AI
Future Innovation tech eXpo Conference 2025



Euro NCAP 2026, 2030 Mid- to Long-Term Roadmap and European Technology Trends

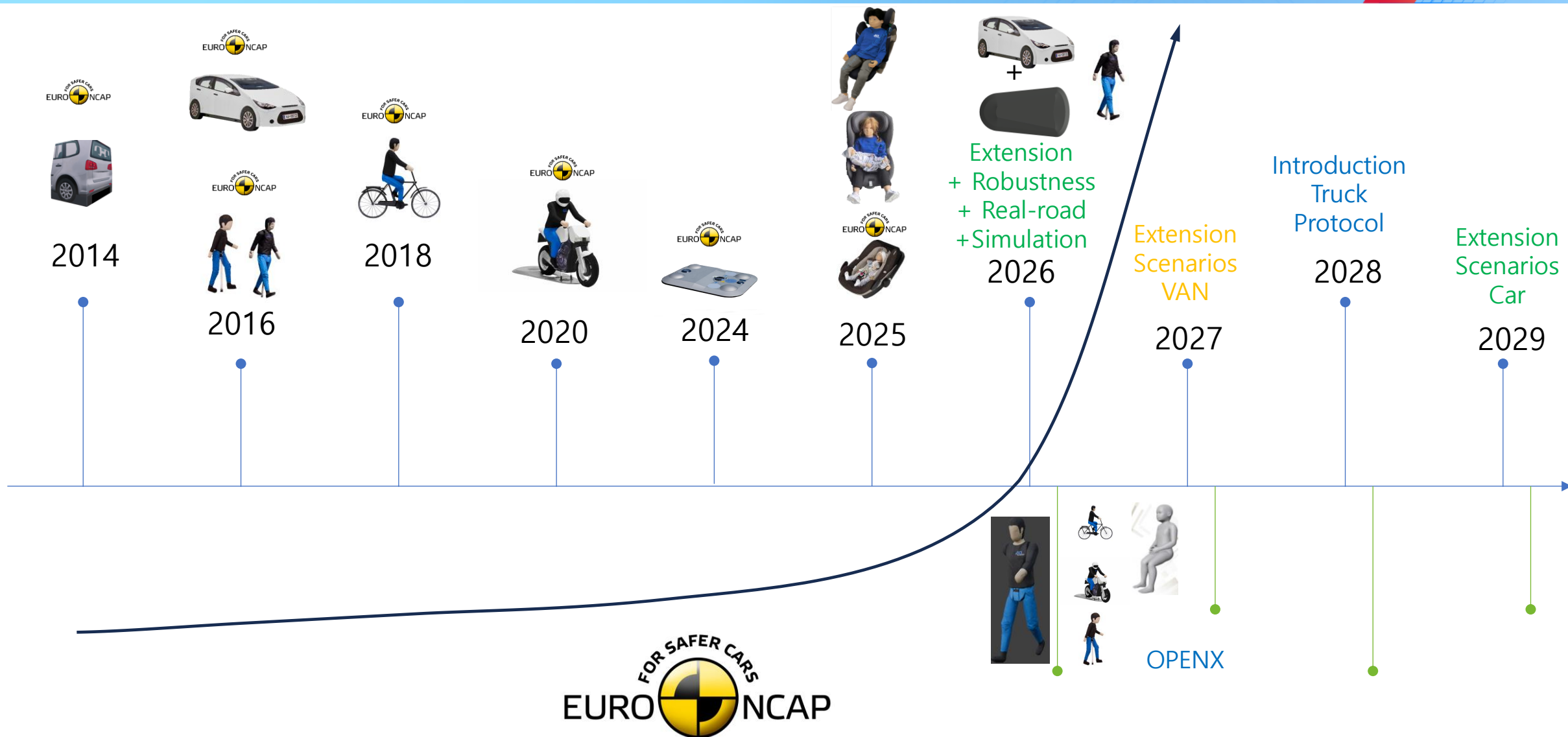
Martin FRITZ / 4activeSystems GmbH



Content

1. Euro NCAP ADAS history
2. ADAS Target validation process
3. Euro NCAP 2026
4. Beyond 2026+
5. Summary

Euro NCAP – ADAS history



Euro NCAP – Research Projects

- vFSS – static Pedestrian Targets – 2010-2011
- ASPECSS – introducing Surfboard Test-system VRU 2011-2014
- ACEA/CLEPA – **Euro NCAP** Articulated Pedestrian Target 2013-2015
- **Euro NCAP** – CATS – European Bicyclist Target 2014 -2016
- EU-Project – Prospect – **Euro NCAP** 2020 VRU Protocol 2015 – 2018
- **Euro NCAP** – MUSE – European Motorcycle Target 2017 -2019
- **CNCAP** CATARC – Electrical Scooter Target for C-NCAP 2021 2018-2020
- **Asian-NCAP** – OASIM – Asian motorized two-Wheeler – 2020 - 2022
- EU-Project – Headstart –validation procedures for Automated Driving 2019 – 2022



OASIM Project (Asian NCAP)



The OASIM project aims to improve the safety of motorcyclists in the ASEAN region by creating active safety testing protocols that are representative of the accident situations in this region. In Southeast Asian countries, the number of seriously injured drivers of motorized 2- and 3-wheelers is significantly higher. The OASIM project aims to develop protocols and appropriate test equipment that will help reduce the number of accidents in Asian countries.

Beginning: Q1/2019

End: Q3/2023

4a Products: 4activeMC-AMT
4activeFB small



Partner:

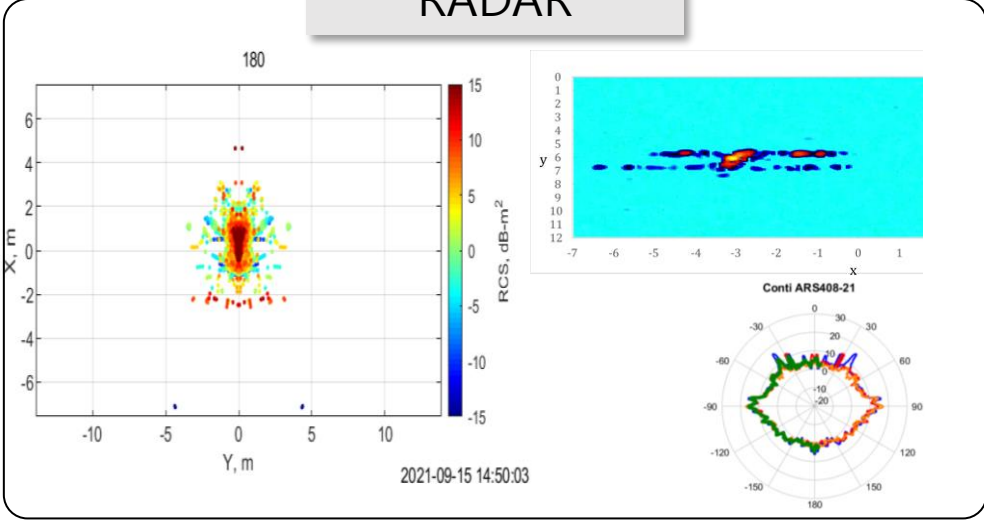
TOYOTA
NISSAN
DAIHATSU
HONDA
YAMAHA
MITSUBISHI

DENSO
VALEO
HITACHI

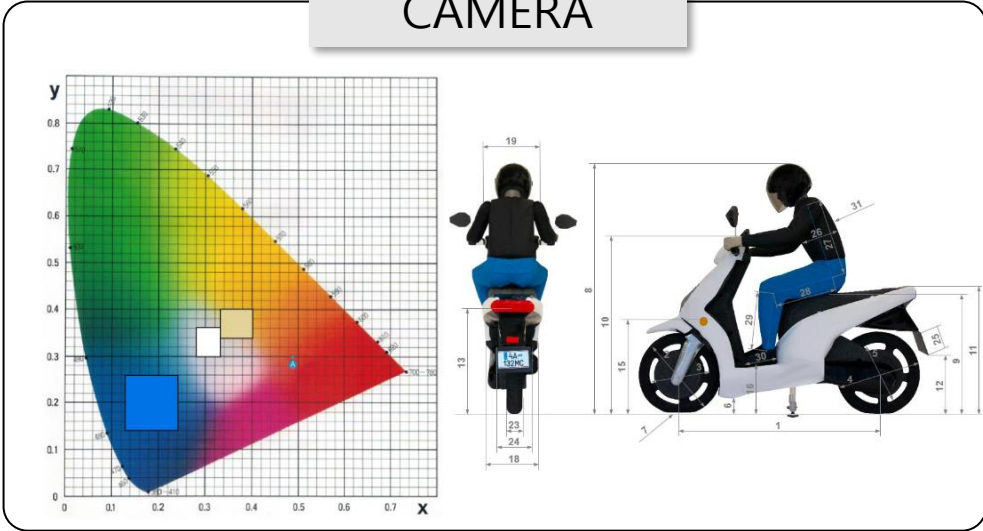
MIROS
CEESAR
ASEAN NCAP
UTAC
4activeSystems

[illegible]

RADAR



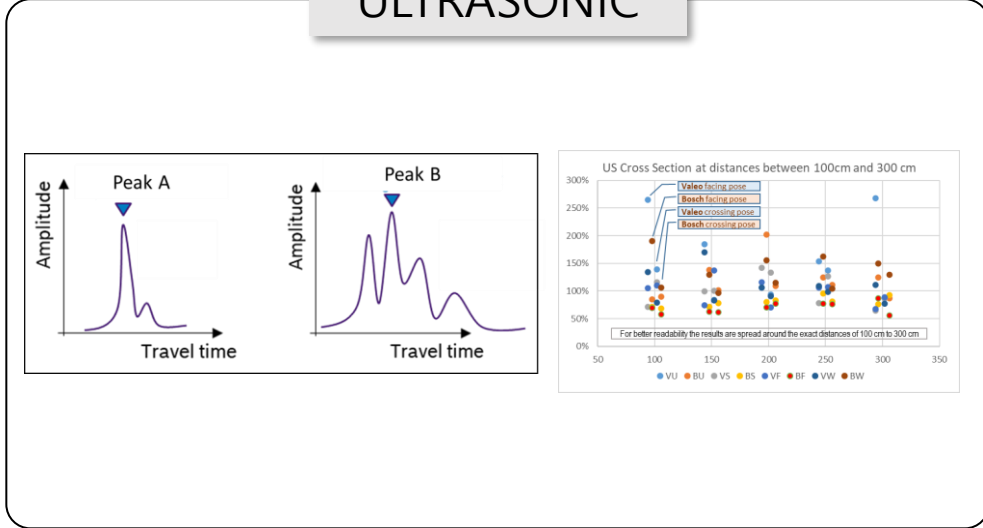
CAMERA



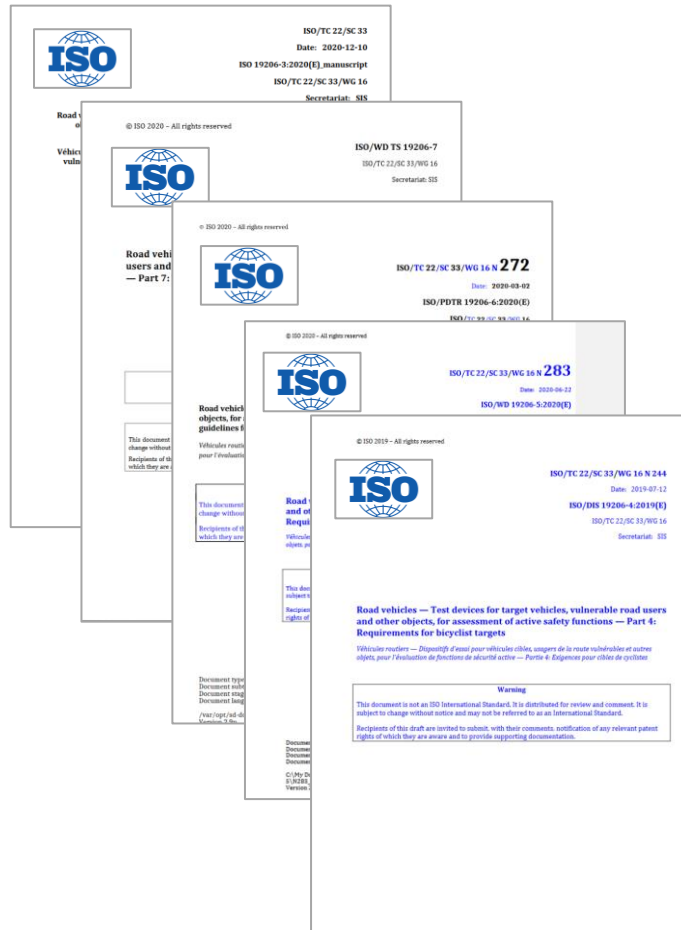
LIDAR



ULTRASONIC



ISO Standards related to ADAS Targets



ISO 19206-2
Requirements for pedestrian targets



ISO DIS 19206-3
Requirements for passenger vehicle 3D targets



ISO 19206-4
Requirements for bicyclist targets



ISO 19206-5
Requirements for power-two-wheeler targets



ISO PRE 19206-6
Requirements for animal



ISO 19206-8
Requirements for test systems



ISO 19237
Pedestrian Detection and Collision Mitigation Systems (PDCMS)



ISO 22078
Bicyclist detection and collision mitigation systems (BDCMS)



ISO 22133
Test object monitoring and control

Typical NCAP – Scenarios -2025



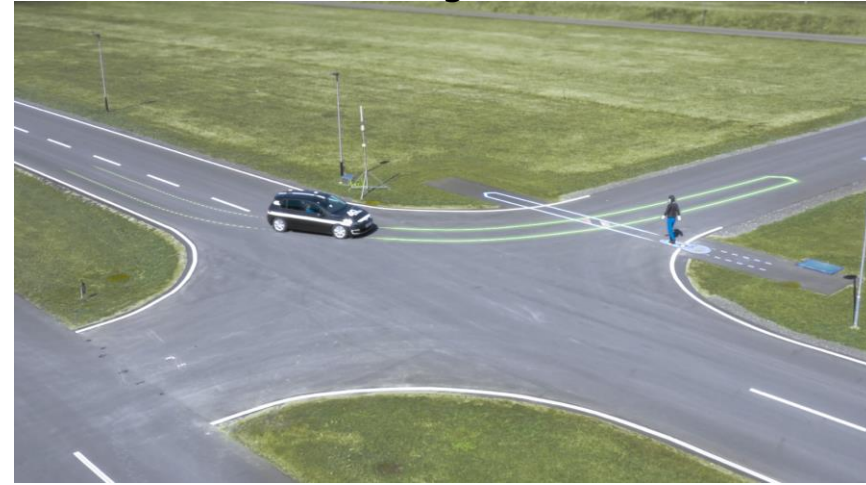
Euro NCAP **CPNA** - Night

Car to Pedestrian Near Side Adult (Night)



Euro NCAP **CPTA**

Car to Pedestrian Turning Adult



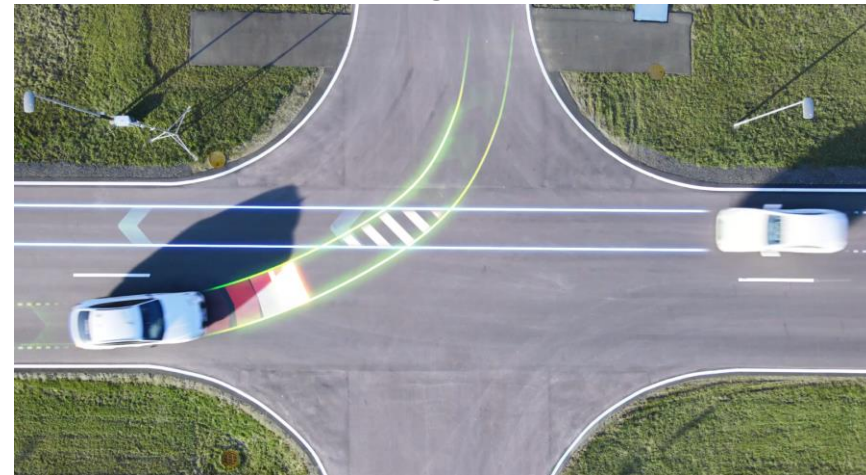
CNCAP - **STA-BSM**

Scooter Target Asia – Blind Spot - Merging



Euro NCAP - **CCFTAP**

Car-to-Car-Front-Turning across Path



Slightly more complex



Euro NCAP – approved Testlabs



Test Laboratory (Status March 2025)	Passive Safety			Active Safety	
	Full scale	Ped Pro	Whiplash	Track tests	On-road**
ADAC (Germany)	Yes	Yes	Yes	Yes	
Applus+ IDIADA (Spain)	Yes	Yes	Yes	Yes	Yes
Asta Zero (Sweden)	-	-	-	Yes	
BASf (Germany)	Yes	Yes	Yes	Yes	Yes
CSI (Italy)	Yes	Yes	Yes	Yes	
DEKRA (Germany)	-	-	-	Yes	
Horiba MIRA (Great Britain)	Yes	Not aPLI	-	Yes	
SLA [TECCON/ALP.lab/TUG] (Austria)	Yes	-	-	Yes	
Thatcham Research (Great Britain)	Yes*	-	Yes	Yes	
TASS/TNO (Netherlands)	Yes	Yes	Yes	Yes	Yes
Transpolis (France)	-	-	-	Yes	
UTAC (France)	Yes	Yes	Yes	Yes	
IVEX (Belgium)	-	-	-	-	Yes
CAERI (China, co-accreditation)	Yes	Yes	-	-	-
CATARC (China, co-accreditation)	Yes	Yes	-	-	-
SMVIC (China, co-accreditation)	Yes	Yes	-	-	-

* MPDB outsourced

** For 2026 testing

Euro NCAP 2026 – New Rating Approach



2009-2025



Reason for a New Rating System

- Adaptation to future safety developments like assisted and automated driving
- Better structure and clearer communication
- Stronger focus on efficiency, robustness, and consumer acceptance
- Benefiting from advances in testing, adding virtual and road testing

2026+



What's New?

- Starts in 2026, 3-year update cycle
- New naming and structure for better consumer understanding
- Current tests rearranged and new assessments added
- Enabling links between boxes, for instance between Safe Driving and Crash Avoidance

Euro NCAP 2026 – 4 Stages of a Crash



Safe Driving

Supporting safer driving behavior.

Technologies:

- Seat Belt Reminder (SBR)
- Driver Monitoring System (DMS)
- Speed Assistance Systems



Crash Avoidance

Preventing collisions through alerts or interventions.

Categories:

- Frontal Collision Avoidance
- Lane Departure Warning/Prevention
- Other collision types

Crash Protection

Minimizing injury during impact.

Areas:

- Frontal Impact
- Side Impact
- Whiplash Protection
- Vulnerable Road User (VRU) Protection

Post-Crash Safety

Emergency response during the "golden hour."

Measures:

- Rescue Information
- Post-Crash Intervention
- Extrication Support

Euro NCAP 2026 – enabling Links



 Safe Driving	 Crash Avoidance	 Crash Protection	 Post-Crash
   	   	   	   
Occupant monitoring	Frontal collisions	Frontal impact	Rescue information
Driver engagement	Lane departure collisions	Side impact	Post-crash intervention
Vehicle assistance	Acceleration prevention	Rear impact	Extrication
		VRU impact	

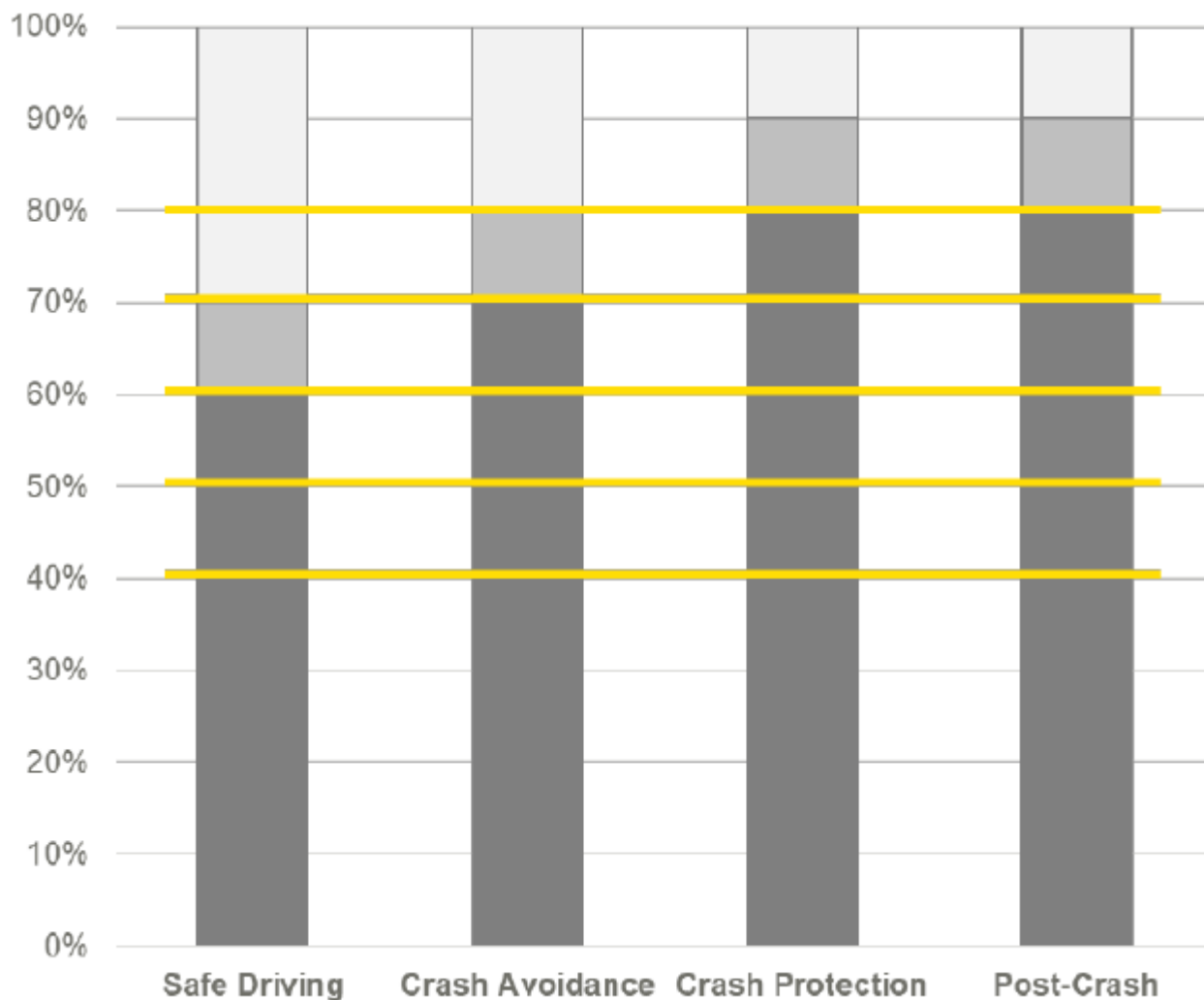
 VULNERABLE ROAD USER

 SAFETY ASSIST

 ADULT OCCUPANT

 CHILD OCCUPANT

Euro NCAP 2026 – Rating Limits



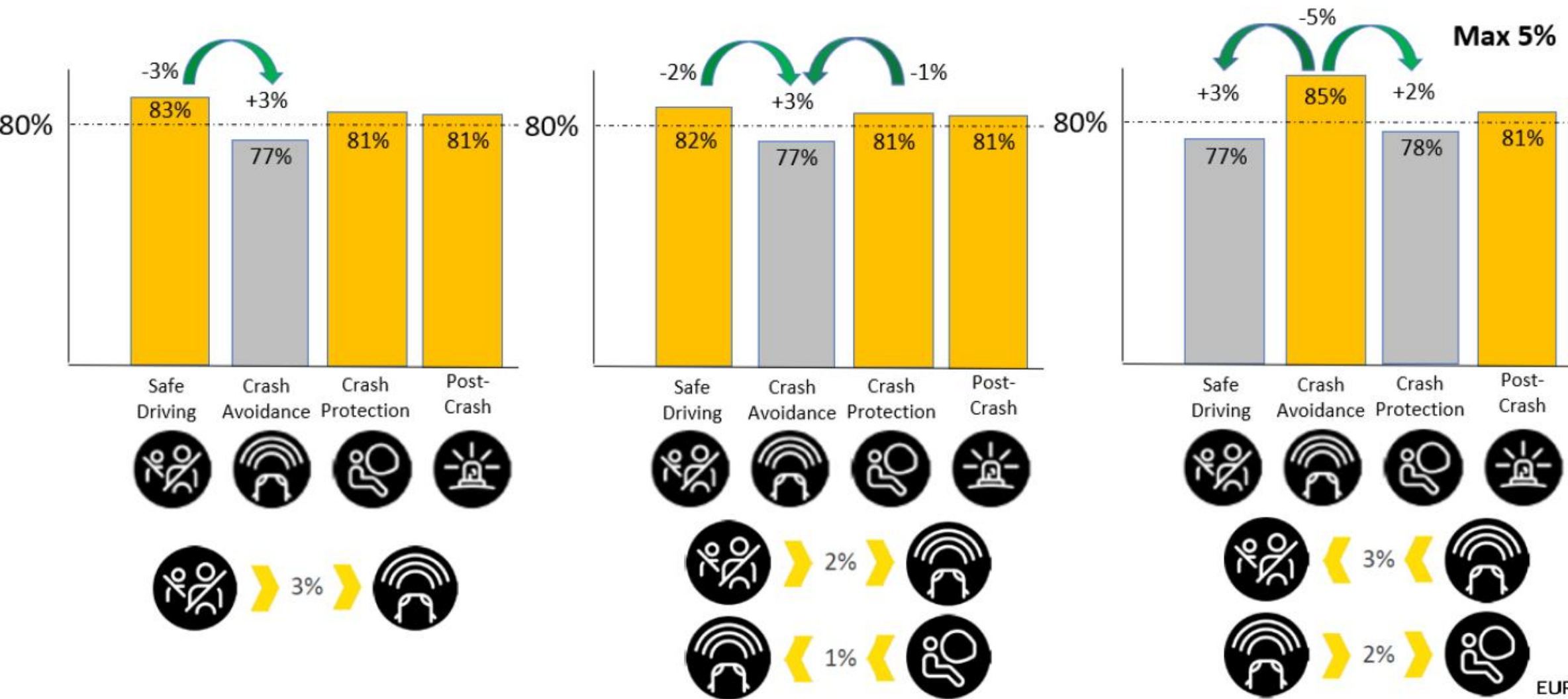
Star rating limits

5-stars	80%
4-stars	70%
3-stars	60%
2-stars	50%
1-star	40%

Soft landing for 2026 & 2027

Star Rating	Safe Driving		Crash Avoidance	
	2026	2027	2026	2027
5	60	70	70	80
4	50	60	60	70
3	40	50	50	60
2	30	40	40	50
1	20	30	30	40

Euro NCAP 2026 – Compensation Rules



Euro NCAP 2026 – 5 Star Requirements



Safe Driving		Crash Avoidance		Crash Protection		Post-Crash	
Occupant Monitoring	30	Frontal Collisions	60	Frontal Impact	40	Rescue Information	40
Seatbelt usage	10	Car & PTW	40	Offset	20	Rescue Sheets	35
Occupant classification	10	Pedestrian & Cyclist	20	Full Width	10	Rescue Guide	5
Occupant presence	10	Lane Departure Collisions	20	VT & Sled	10	Post-Crash Intervention	25
Driver Engagement	30	Lane Departure	10	Side Impact	35	Advanced eCall	20
Driver Monitoring	25	Car & PTW	10	MDB	15	Multi-collision Brake	5
General Vehicle Controls	5	Low Speed Collisions	20	Pole	10	Vehicle Extrication	35
Vehicle Assistance	40	Car & PTW	10	Farside	10	Energy Management	20
Speed Assistance	20	Pedestrian & Cyclist	10	Rear Impact	5	Occupant Extrication	15
ACC Performance	15	Active Safety tests for the proving ground		VRU Impact	20		
Steering Assistance	5			Head impact	10		
				Pelvis & Leg impact	10		
Weight: 20	100	Weight: 20	100	Weight: 50	100	Weight: 10	100

Standard Tests ~80

Standard + Extended Tests ~1200
Robustness Tests >5000

Euro NCAP 2026 – The Layers



Layer	Description
Standard Range	Baseline tests under ideal conditions; foundational performance.
Extended Range	Adds minor complexity (e.g. speed variations, impact positions).
Robustness Layer	Introduces real-world variability (e.g. weather, illumination, driver input, target appearance).

CCCscp	Function	GVT speed						
		20 km/h	30 km/h	40 km/h	50 km/h	60 km/h	70 km/h	80 km/h
20 km/h	AEB							
30 km/h	AEB							
40 km/h	AEB						N/A	N/A
50 km/h	AEB						N/A	N/A
60 km/h	AEB						N/A	N/A
70 km/h	AEB			N/A	N/A	N/A	N/A	N/A
80 km/h	AEB			N/A	N/A	N/A	N/A	N/A

CBLA	EBT speed	Function	Impact Location			
			10%	25%	50%	75%
20 km/h	15 km/h	AEB				
30 km/h	15 km/h	AEB				
40 km/h	15 km/h	AEB				
50 km/h	15 km/h	AEB				
60 km/h	15 km/h	AEB				
50 km/h	20 km/h	FCW				
60 km/h	20 km/h	FCW				
70 km/h	20 km/h	FCW				
80 km/h	20 km/h	FCW				

Euro NCAP 2026 – Robustness Layer



Robustness layers (Perception)		Description	Verification Test	Performance prediction source
Type	Layer			
Target	Type	Different collision partner type (e.g., Car: Vehicle Cat.: N1, N2, N3 PTW: Vehicle Cat.: L1, Bicyclist: Powered Standing Scooter)	No	Field Data**
	Appearance	Same collision partner type but with different appearance (e.g., colour, accessories, shape)	No	
Environment	Adverse weather conditions	Functionality available under the presence of Rain, Fog, Dirt/ice/moisture	No	
	Illumination (Night time)	Performance in darkness (1 lux) for all daytime scenarios	No*	
	Illumination - Glare	Functionality available under the presence of glare caused by Low sun (all scenarios)	No	
		Performance under the presence of glare caused by headlights of a stationary vehicle on adjacent lane (all standard nighttime scenarios)	No*	
	Infrastructure / clutter	Performance in environments cluttered with objects such as urban furniture or secondary road users (without fully obscuring the main target)	No*	
	Obscuration / Obstruction	Variance in the layout of nominal obstructions	No*	

- Variable target heading
- Variable targets types
- Variable target colors, shape, accessories etc.
- Variable adverse weather conditions
- Variable illuminations and light conditions
- Variable objects in test environment
- Variable obscuration/obstruction

Robustness testing requires repeatable, controlled execution of complex scenarios, including:

- Variable driver steering input
- Variable target speeds
- Variable target acceleration
- Variable target positions

Target Robustness layers		Verification condition*	Assessment Criteria
Layer	Scenarios		
	CBNA, CBFA, CBNAO	+5 km/h	≠red
		-3 km/h	Same or better than Standard Range
Acceleration	CCRb, CMRb	+2 m/s ²	Same or better than Standard Range
		-2 m/s ²	≠red
Initial position offset	CPNA, CPFA, CBNA, CBFA, CPNCO, CBNAO	-25% m of distance to impact point	≠red
	CPTA	±0.5m Path offset	Same or better than Standard Range
	CCFtap, CMFtap, CBTA		
	CCRb, CMRb	±0.5s Time headway	≠red
Trajectory/ Heading	CCRs, CMRs	±20° (rotation around the impact point)	Same or better than Standard Range
	CPNA, CPFA, CBNA, CBFA, CPNCO, CBNAO		

Euro NCAP 2026 – Scoring

Standard Range

Each grid cell scored by predicted color:

- Green = 1.00
- Yellow = 0.75
- Orange = 0.50
- Brown = 0.25
- Red = 0.00

Scenario	Standard	Extended	Robustness	Total
Car-to-Car Rear	5.2 pts	0.65 pts	0.65 pts	6.5 pts
Car-to-Car Front	4.0 pts	0.5 pts	0.5 pts	5.0 pts
Car-to-Motorcycle Rear	2.8 pts	0.35 pts	0.35 pts	3.5 pts
Crossing (Car/PTW)	6 pts	0.75 pts	0.75 pts	7.5 pts

Extended Range

Grid cells scored:

- Brown to Green = 1.00
- Red = 0.00

Final score:

- 50–74.99% = 50%
- 75–99.99% = 75%
- 100% = 100%

CBLA	EBT speed	Function	Impact Location			
			10%	25%	50%	75%
20 km/h	15 km/h	AEB				
30 km/h	15 km/h	AEB				
40 km/h	15 km/h	AEB				
50 km/h	15 km/h	AEB				
60 km/h	15 km/h	AEB				
50 km/h	20 km/h	FCW				
60 km/h	20 km/h	FCW				
70 km/h	20 km/h	FCW				
80 km/h	20 km/h	FCW				

Robustness Layer

Score = 100% if passed, 0% if failed.

Eligibility: ≥50% score in Standard Range.

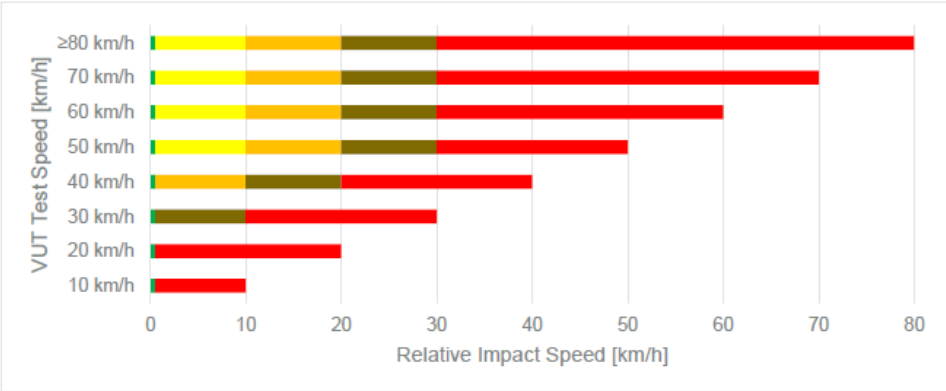
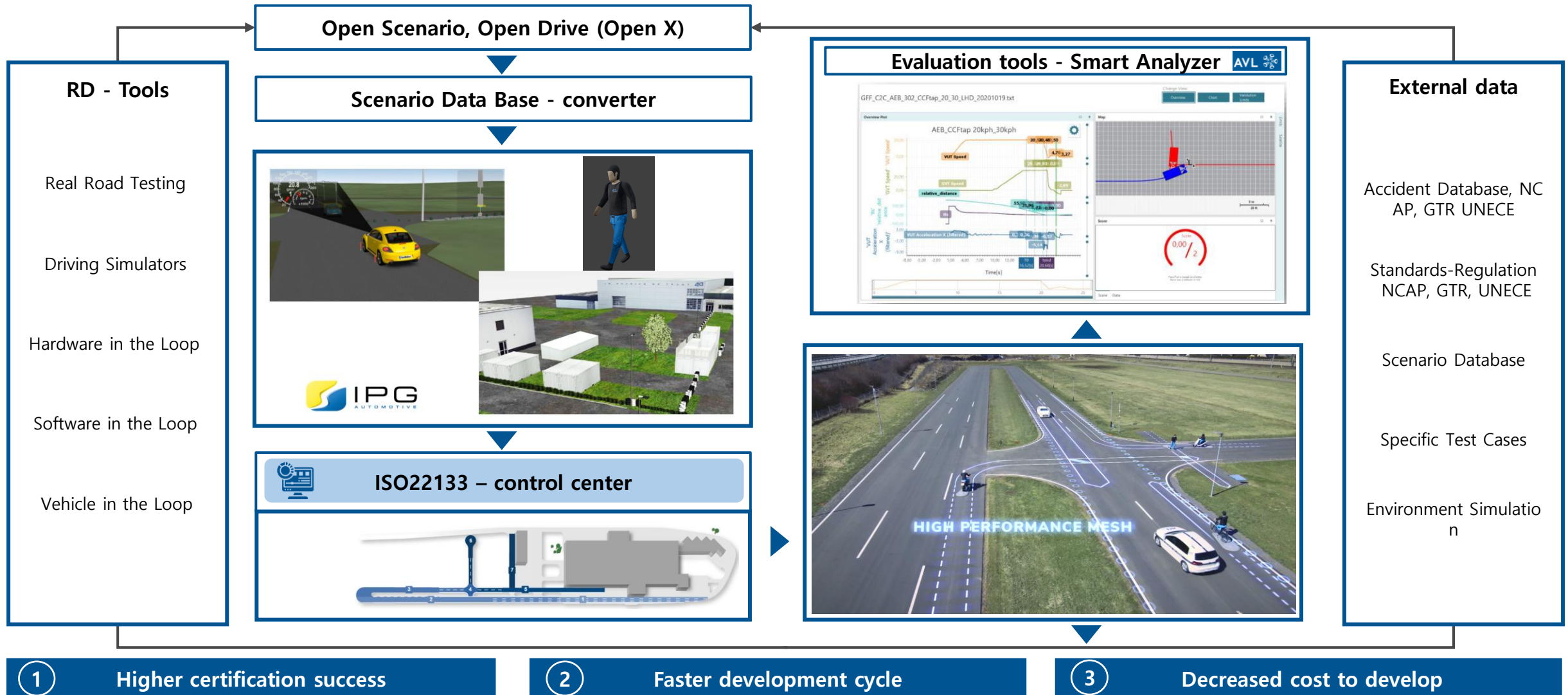


Figure 5-1 Relative Impact Speed colour band criteria (applicable to Car & PTW Rear, and Pedestrian & Cyclist Longitudinal / Crossing)



Figure 5-2 Speed Reduction colour band criteria (applicable to Car & PTW Front)

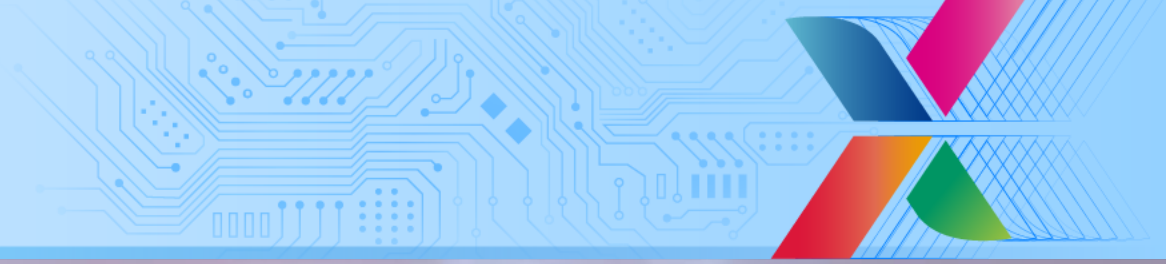
filling the gap virtual/physical - validation



Validated virtual ADAS and Occupant models



Beyond 2026



Intention recognition (Pedestrian turning head, realistic actor)?

Extension of night scenarios and low light conditions?

Considering of Wildlife accidents?

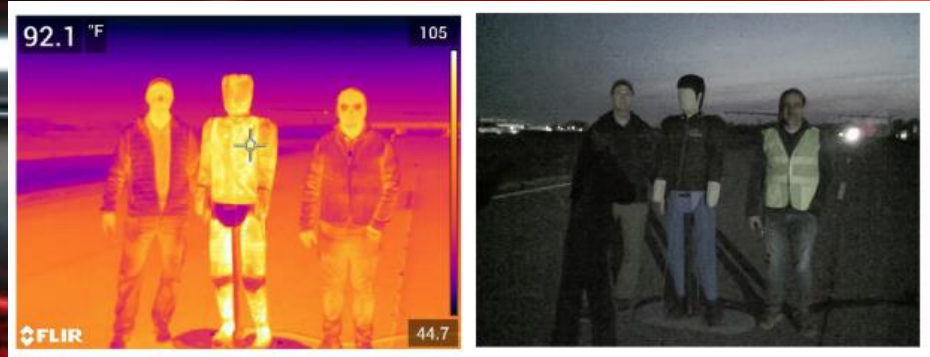
Extension of virtualization capability and models?



Beyond 2026



Beyond 2026



Source: TELEDYNE FLIR Thermal-Fused Automatic Emergency Braking
FMVSS No. 127 Pedestrian Automatic Emergency Braking Test Report Dec.24

Summary

