



Euro NCAP Roadmap 2025 – “Now and then....”

Mar 2022

Strategic Planning

◆ Start
 ● Protocol Release
 ■ Implementation

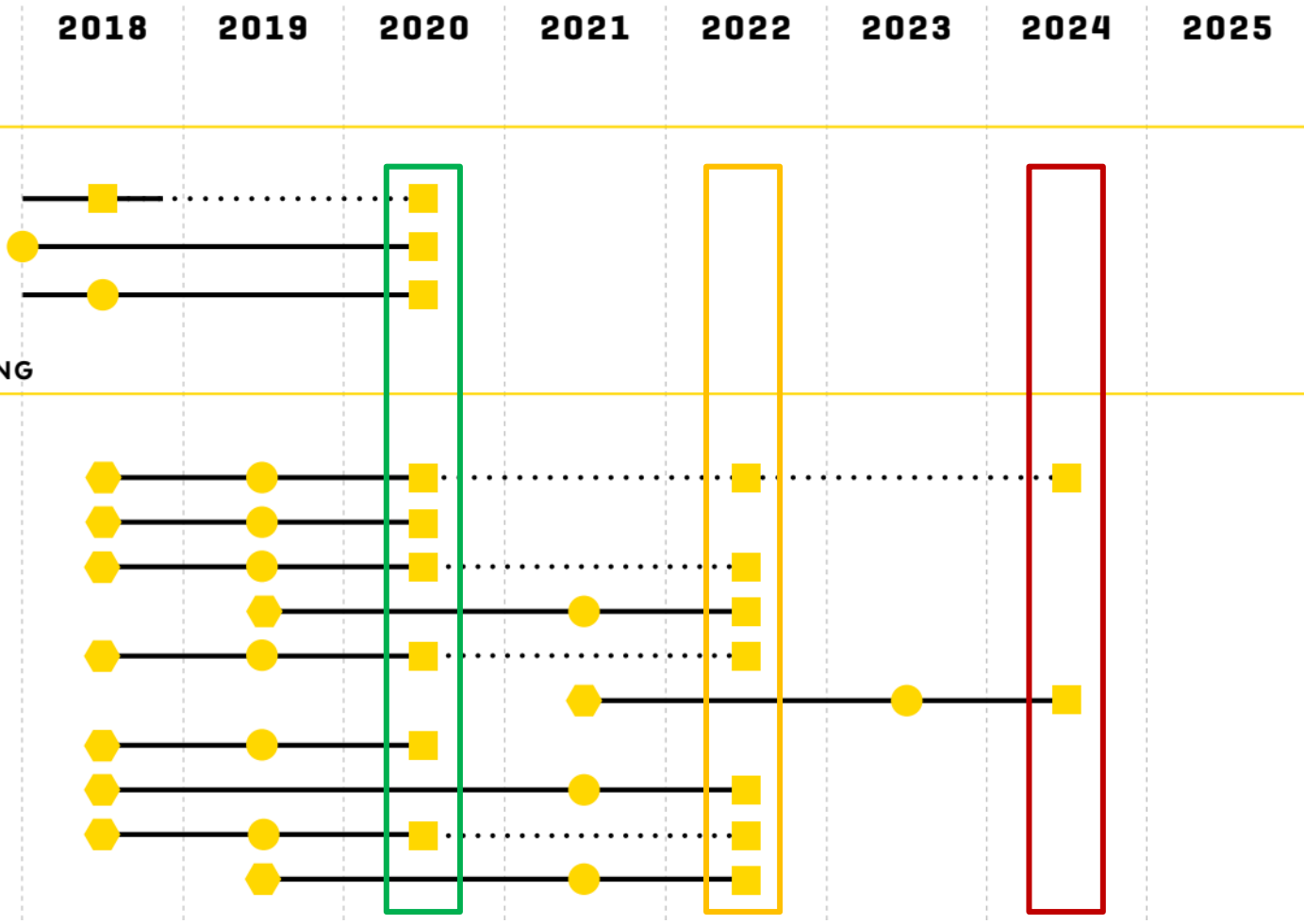
2018 2019 2020 2021 2022 2023 2024 2025

ROADMAP 2020

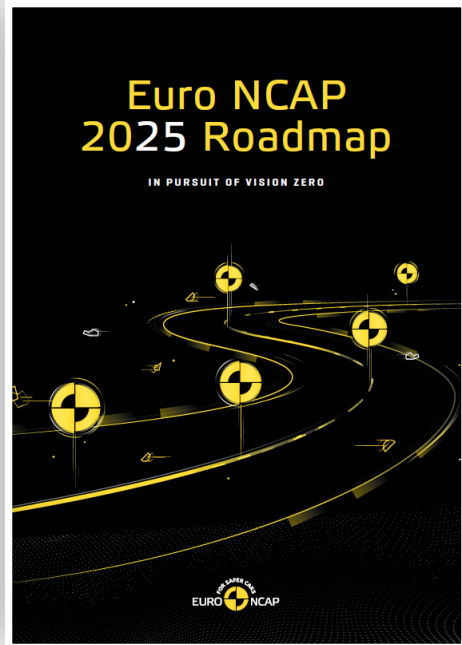
AEB VRU cyclist
 Far-side protection
 Mobile progressive deformable barrier

ROADMAP 2025 – SAFETY RATING

Driver monitoring
 AEB VRU pedestrian - Back-over
 AEB - Junction & Crossing
 AEB - Head-on
 Automatic Emergency Steering
 V2X
 Whiplash/Rear-end Crash Protection
 Revised subsystem for pedestrian & cyclist
 Rescue, extrication and safety
 Child presence detection



▶ Protocols delivered
 ▶ Protocols under development
 ▶ To be initiated



Tests & Assessments



Adult Occupant Protection

- Frontal Offset Deformable (barrier)
- Full-width Rigid (barrier)
- Advanced European Mobile Deformable (barrier)
- Oblique Side (pole)
- Whiplash Neck Injury (subsystem)
- Low-speed AEB (track)



VRU Protection

- Pedestrian Head Impact (subsystem)
- Pedestrian Upper Leg Impact (subsystem)
- Pedestrian Lower Leg Impact (subsystem)
- AEB VRU Pedestrian (track)
- AEB VRU Cyclist (track)



Child Occupant Protection

- Frontal Offset Deformable (barrier)
- Advanced European Mobile Deformable (barrier)
- CRS Installation (operational check)
- Vehicle based (functional check)

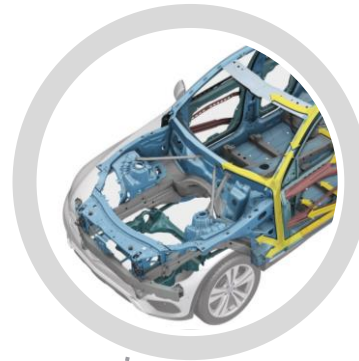


Safety Assist

- Seat Belt Reminder (operational check)
- Speed Assistance (operational check)
- High-speed AEB (track)
- Lane Support (track)

2020 Safety Rating Updates

AEB test scenarios including
Turn-across-Path and Reverse

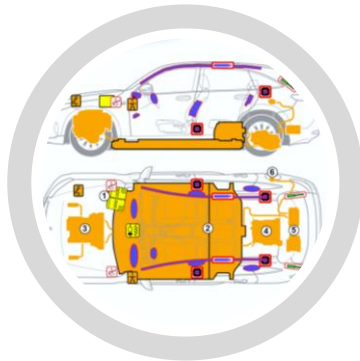


Mobile Progressive Deformable Barrier test:
THOR ATD, Q10₂₀₂₀ & Partner protection



Increased near-side
test severity & far-
side protection

Attention Assist



Rescue, Extrication & Post-crash Safety



© Mercedes-Benz (2019)



Revised Front Seat Whiplash

2020 Test Updates

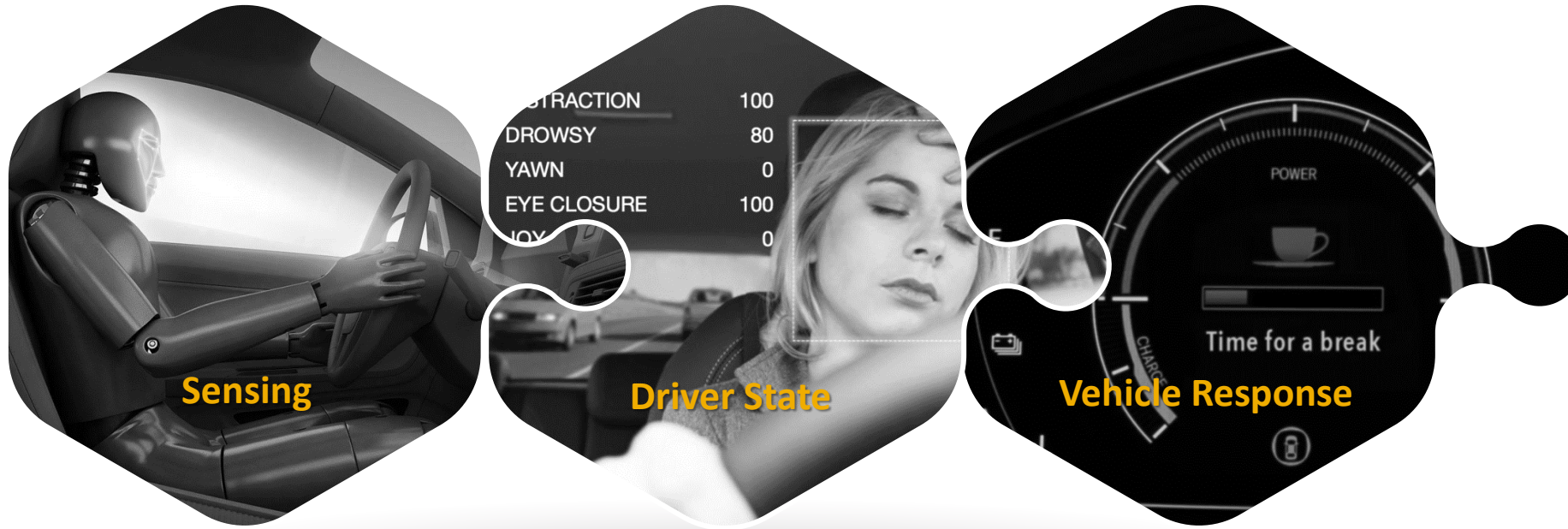


Mobile Progressive Deformable Barrier - MPDB



Turn Across Path – Car to Pedestrian and Car to Car

Driver State Monitoring



DISTRACTION	FATIGUE	UNRESPONSIVE DRIVER
Long Distraction	Drowsiness	Unresponsive Driver
Short Distraction (Time Sharing)	Microsleep	
Phone Usage	Sleep	

Driver Coverage

Driver	
Age	Youthful (16-18) – Aged (≥ 80)
Sex	All
Stature	AF05 – AM95
Skin Complexion	Fitzpatrick Skin Type (1 – 6)
Eyelid Aperture	14mm > 6mm

OCCLUSION	
Lighting	Daytime - night-time
Eyewear	Clear glasses and sunglasses
Facial Hair	Beard
Hand on Wheel	One hand blocking camera view
Facial occlusion	Facemask, hat, etc.

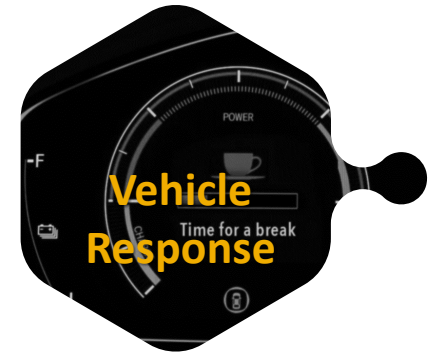


Lizard long distraction – infotainment system



Owl long distraction – driver window

Production Examples



Mazda MX-30 – sleep



Subaru Forester – drowsiness and distraction



DS7 – drowsiness and distraction



Mercedes S-Class – microsleap



Genesis GV70 – long distraction



Assisted, Automated & Autonomous Driving



Assisted

- Driver retains full responsibility and shares control with the Vehicle
- Vehicle & Driver share **Object** and **Event Detection** and **Response** (**OEDR**)
- Driver may not perform secondary tasks over and above those permitted during normal driving



Automated

- Vehicle has full responsibility for control in **Operational Design Domain** (**ODD**) defined by the OEM
- Vehicle performs **OEDR**
- Driver may perform certain other non-driving tasks but needs to be available for safe transition of control

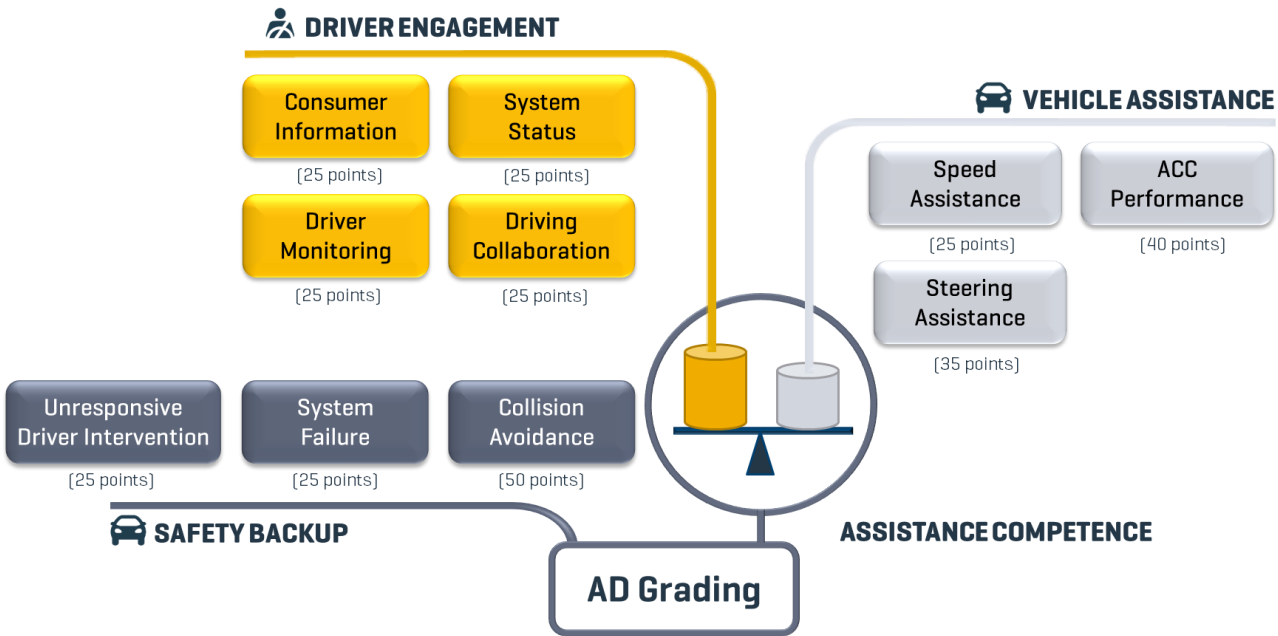








Autonomous

- Vehicle has full responsibility for control in **Operational Design Domain** (**ODD**) defined by the OEM
- Vehicle performs **OEDR**
- Driver is effectively a passenger
- Driver has no ability to control [apart from switching to another mode]

Testing Automation

Development of Assisted Driving grading tests








		
2020 ■ ■ ■ ■ VERY GOOD	2020 ■ ■ ■ ■ VERY GOOD	2020 ■ ■ ■ ■ GOOD
Audi Q8 Adaptive Cruise Assist	BMW 3 Series Driving Assistant Professional	Ford Kuga Co-Pilot 360
		



Assisted & Automated Driving

Next Steps

Operational Design Domain

	Parking	City	Inter-Urban	Highway
Assisted				
Automated				
Autonomous				

Commercial Vehicle Safety

- Highlight lack of ADAS on commercial vans, show difference between brands in performance and fitment

2019 Nissan Juke



2019 NV400



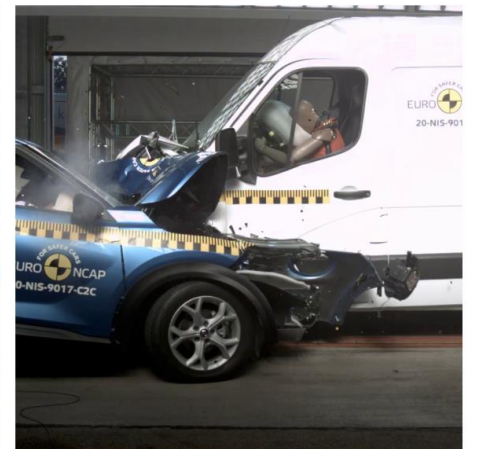
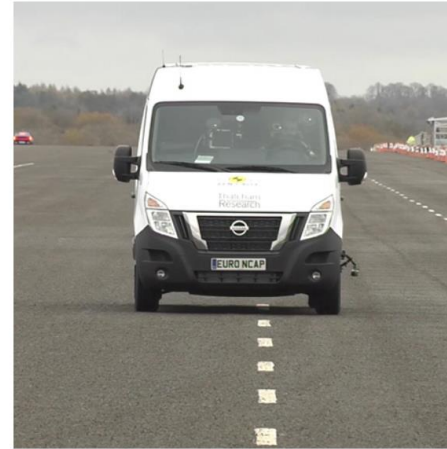
●	AEB City	●
●	AEB Interurban	●
●	AEB Pedestrian	●
●	AEB Cyclist	●
●	Blind Spot Detection	●
●	Lane Departure Warning	●
●	Lane Keep Assist	●
●	Speed Assistance	●
●	Seat belt reminder (all seats)	●
●	Driver Airbag	●
●	Passenger Airbag	●
●	Curtain Airbag	●

● Standard across EU/UK ● Optional ● Not available

Commercial Van Safety

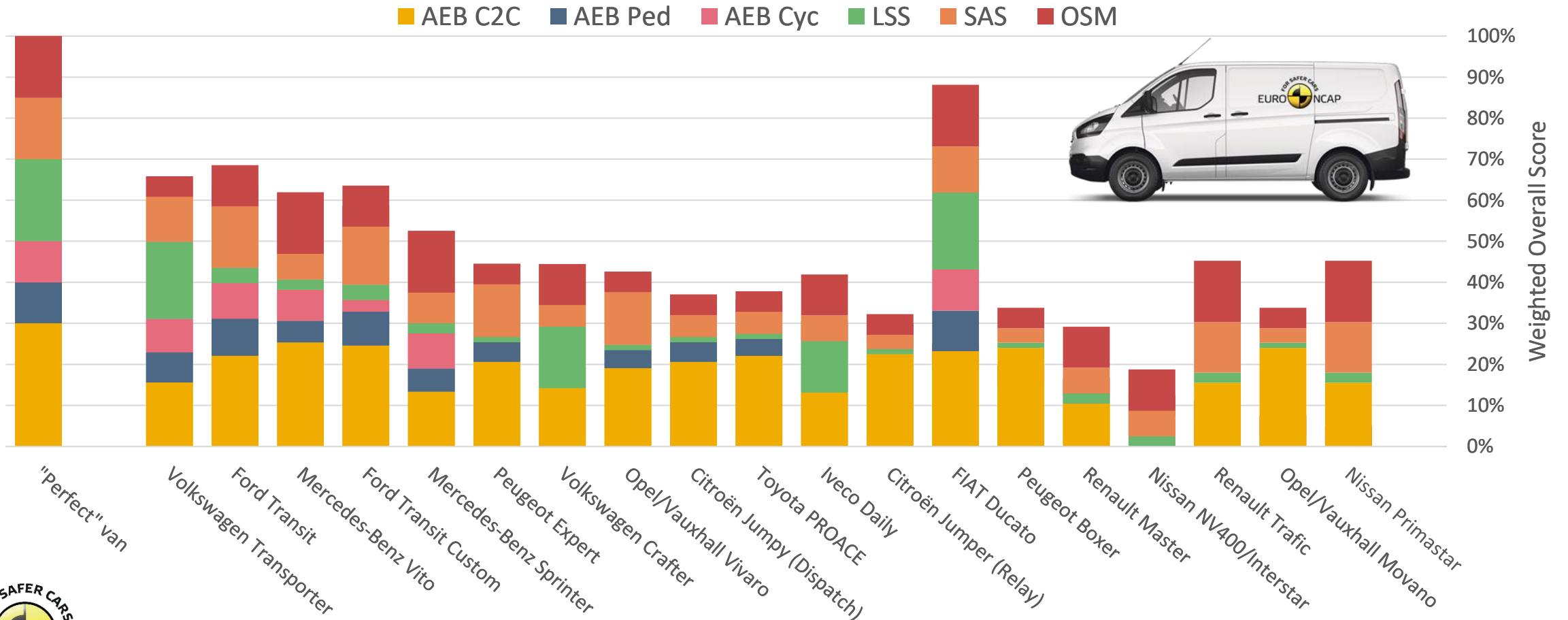
ADAS on Commercial Vans

- Raise awareness
 - Highlight lack of ADAS
 - Show performance difference between brands in performance and fitment
- 2020/2021 Test series
 - Covering 19 vans - 98% of EU sales
 - Benchmark against 2018 Euro NCAP Safety Assist
 - Weighted overall performance score
- ADAS Fitment survey
 - Document ADAS availability across Europe: standard, optional, not available



Commercial Van Safety

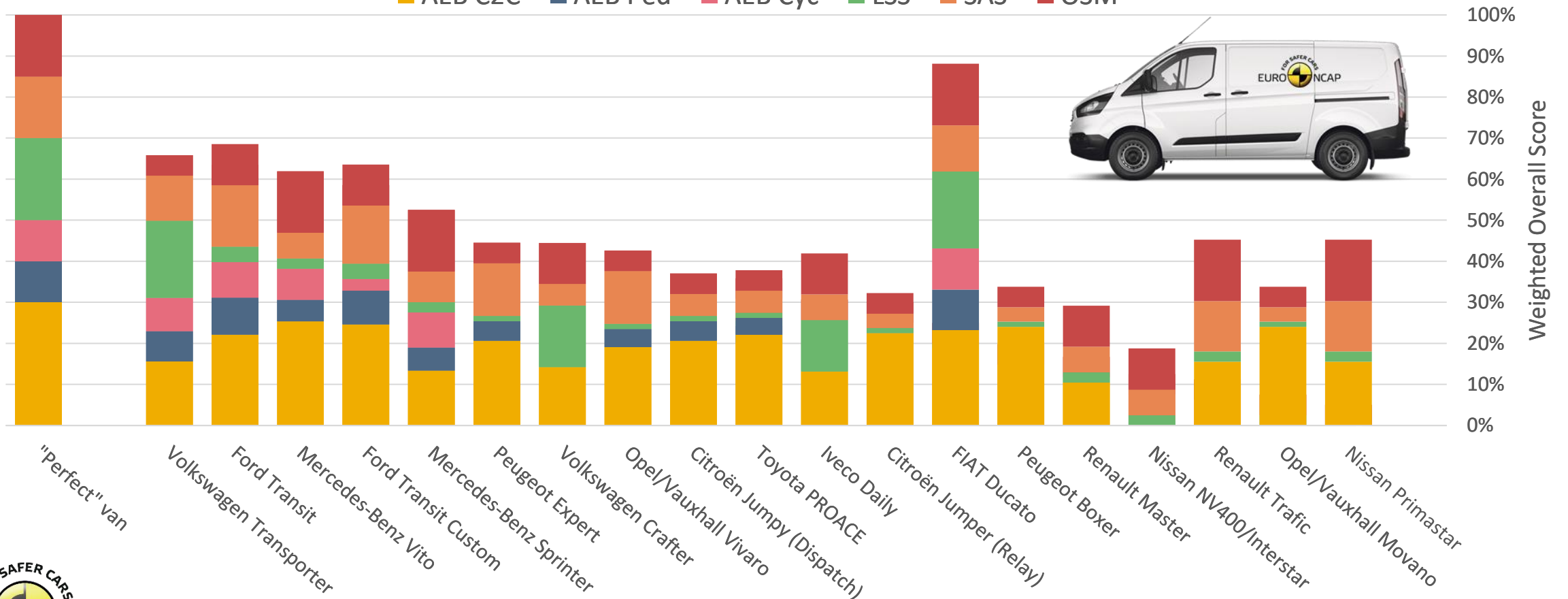
February 2022 – Commercial Van ADAS Scores



Commercial Van Safety

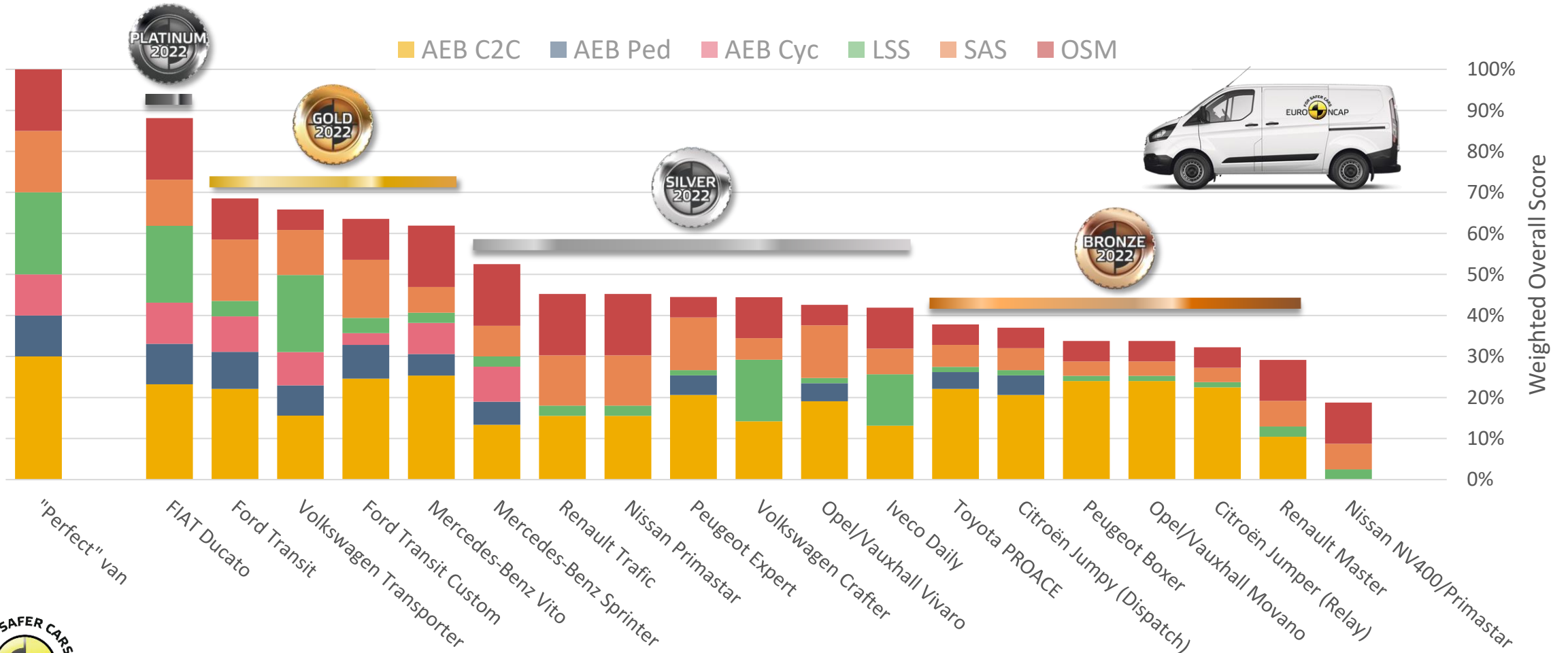
February 2022 – Commercial Van ADAS Scores

■ AEB C2C
 ■ AEB Ped
 ■ AEB Cyc
 ■ LSS
 ■ SAS
 ■ OSM



Commercial Van Safety

February 2022 – Commercial Van ADAS Scores



Latest Ratings

New



CLEAN AIR INDEX

10.0 /10



ENERGY EFFICIENCY INDEX

10.0 /10



GREENHOUSE GAS INDEX

10.0 /10

New



RENAULT



2020

Renault ZOE

R110 ZE50 ELECTRIC 4x2 AUTOMATIC



New



TOYOTA



2020

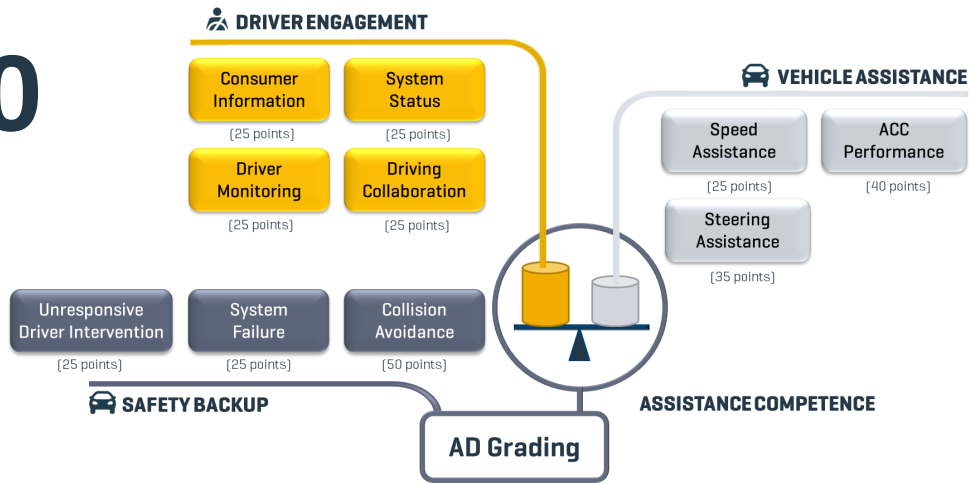
Toyota C-HR

1.8 HYBRID 4x2 AUTOMATIC



ALL RESULTS

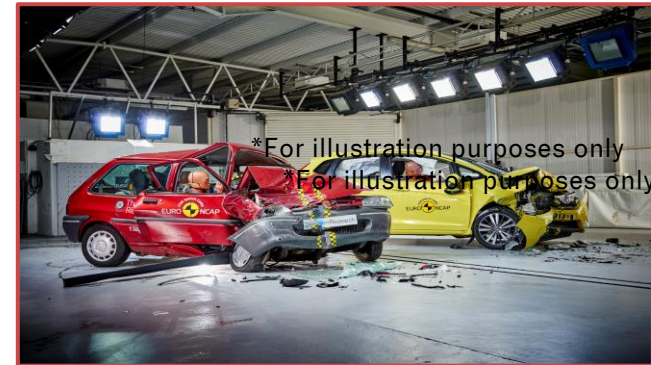
Roadmap 2030



Assisted & Automated Driving
Integrating Automated Driving into overall ratings

Overall Safety Rating
Primary, secondary and tertiary safety of cars - protecting car occupants of all ages, gender and sizes as well as vulnerable road users

Other Vehicle Types
Vans, Trucks, Powered Two Wheelers and Mobility as a service



Reflections on Future Needs

■ Important trends shaping the future of safety testing

- GSR2 Regulates most new Passive and Active requirements – but more to do
- Holistic (scenario based) assessment of integrated safety functions
- Real-world robustness
- Other vehicle types –legacy issues
- Population diversity – size and shape
- Mobility – Users and not owners
- Flexibility- moveable and safe seating
- Software & OTA updates
- Connectivity & cybersecurity
- Virtual testing augmenting and replacing physical testing



Some thoughts.....

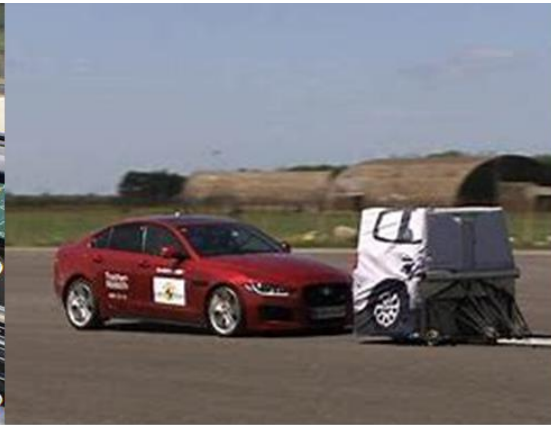
Wholistic Safety

■ Scenario Based Testing

“Euro NCAP will retire the current four box system (Adult, Child, Pedestrian and ADAS) and replace it with a new system that categorise tests according to the **four distinctive phases** of an accident: **Safe Driving**, **Crash Avoidance**, **Occupant Protection** and **Post-Crash** safety. New content will be added, including, in the first step, Level 2 driver support systems.”



Safe Driving



Active Safety



Passive Safety



Tertiary Safety

Safe Driving

- In-Cabin Monitoring
 - Driver inattention and drowsiness
 - Driver cognitive distraction, driving under influence
 - Child Presence Detection (CPD) and seatbelt reminder improvements
- Speed Assistance
 - Speed control; adaptation to road features
 - Comms based local hazard info and warnings
- L2/L3 Driver Support Systems
 - Assistance Competence and Safety Backup
 - Expand highway ODD to include Inter-Urban and City
 - L3 grading to focus of ALKS – with Virtual Testing



Crash Avoidance

- Robustness of current scenarios
- AEB reverse child targets, turning cyclist, e-scooters
- Revised targets
- Adverse weather and lighting
- V2V information
- Virtual testing using vehicle in the loop methodology for safe testing and complex scenarios
- Pedal misapplication



Crash Protection

- Front and side crashes
 - Front sled replacing full-width rigid barrier test
 - THOR 5F female crash dummy for passenger/driver
 - ATD models augmented by digital human body models
 - Revised Whiplash protection – virtual?
 - Rear seat head restraints improvements
- Pedestrian & Cyclist safety
 - Criteria for higher injury risk to females and
 - Micro-mobility and eScooters
 - Grid approach extended to BLE and leg testing
 - Continue promoting deployable systems for cyclists



Post Crash Safety

- Rescue, Excavation and Safety
- Support rollout of eCall,
- V2X smarter blue light dispatch
- EV Cell-Integrity to address first responder safety and thermal runaway
- dCall encouraging vehicles to calculate and send probability of injury with the eCall or allow PSAP to derive injury probability



Mobility

- Mobility as a service (MaaS)
- Voluntary Safety Assessment – Safety Label
- Appeal to Fleet operators and road authorities
- Aligns with Commercial Vehicle ethos



Commercial Vehicles

- Building on Commercial Van Safety
- Vans testing expanding to reflect passenger car protocol development
- Extend to include Medium and Heavy trucks (N2- N3)
- Appeal to Fleet operators and road authorities
- City and Highway domains
- Builds on the “Safety Label”



HighwaySafe	Platinum	Gold	Silver	Bronze	Not recommended
CitySafe	Not recommended	Bronze	Silver	Gold	Platinum

Next Steps and Conclusion

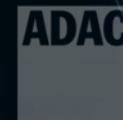
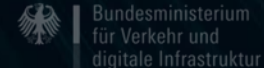
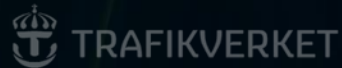
- VM, Industry and Stakeholder Engagements
- Board decisioning June
- 2030 Roadmap Launch Autumn 2022
 - From Safe Cars to Safer Mobility
 - Integrated methodology reflecting safety over time
 - Inclusion of Assisted in Safe Driving
 - New vehicle types – Heavy Trucks and Mobility-as-a-Service
 - From Consumer to Operator – Safety Assurance
 - Other initiatives include Cyber Security and Data
 - Towards vision zero....



*For illustration purposes only

FOR SAFER CARS

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