

Euro NCAP Driver Monitoring Framework for 2029

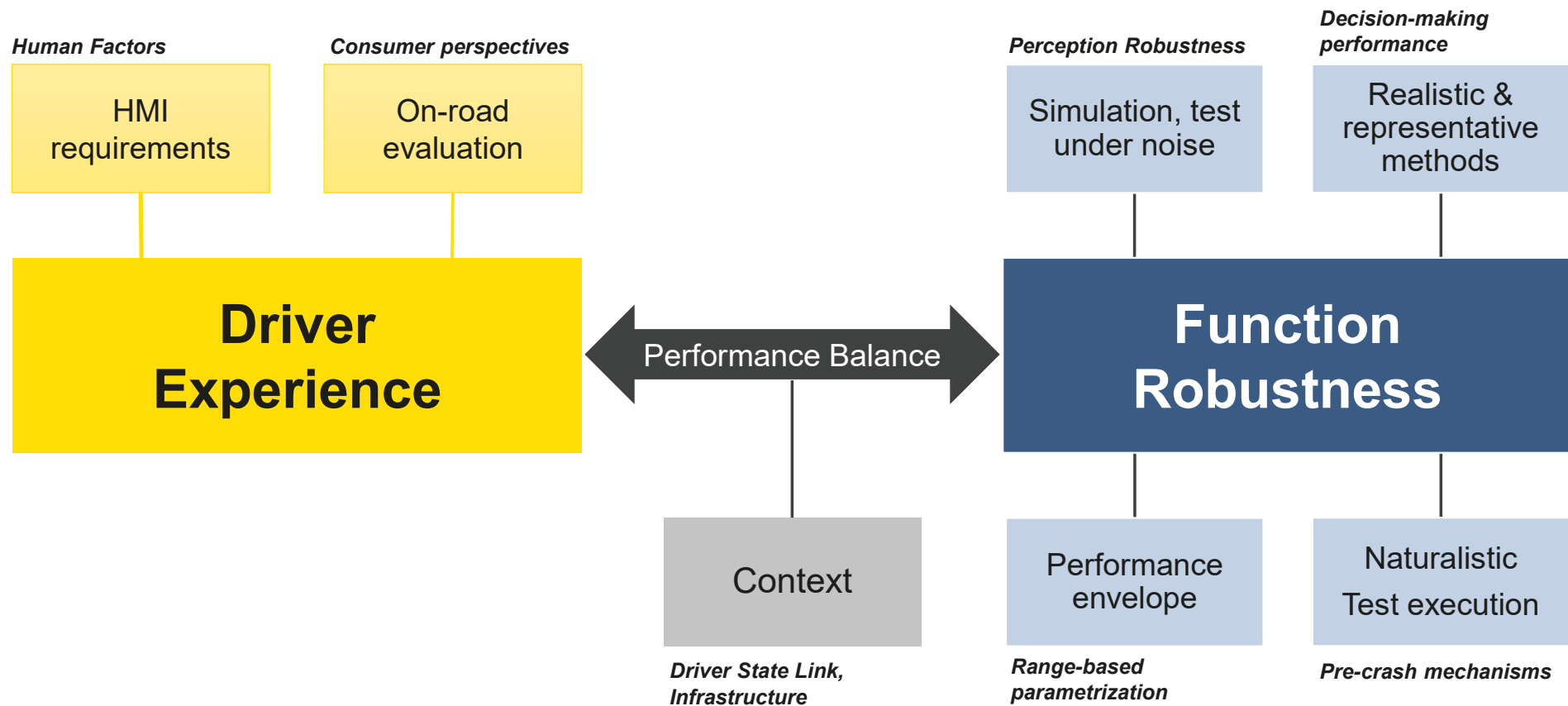


Euro NCAP
Driving a Safer Future

Adriano Palao
20/10/2026



Safe Driving & Crash Avoidance – 2029 Roadmap



Driver Experience

Drivers baffled by in-car safety assistance systems
‘Widespread confusion creates safety concerns and erodes confidence’, says new report

By **Chris Rosamond**
2 APR 2025

Modern ADAS driver-assistance systems can be borderline dangerous

Editor Paul Barker believes that some modern car safety tech is more of a hindrance than a benefit

By **Paul Barker**
18 SEP 2024

Car industry piling on the pressure for weak assisted driving system safety rules in Europe

Are Car Safety Systems Driving Motorists To Switch Off?

Turn That @#% Off!

Report: Automated ADAS Safety Features Are A ‘Nightmare’ For Drivers

By **Nicole Kobie**, Contributor. © Nicole Kobie is a tech and transport journalist ...
Published Mar 22, 2025, 04:05pm EDT

British drivers turning off EU car safety features despite risk of traffic and accident nightmare

Press release

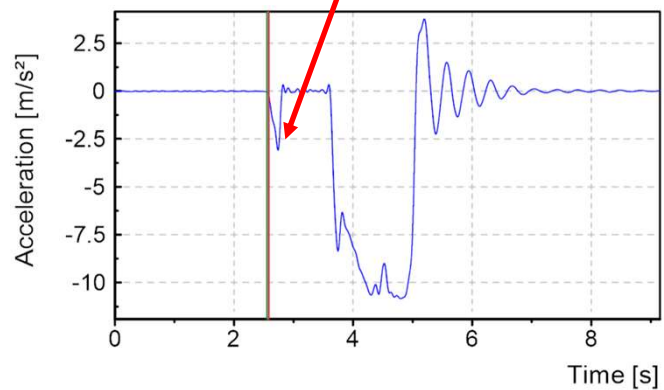
Car safety tech driving motorists round the bend, Which? finds

Motorists are switching off automatic safety tech designed to help cars adhere to the speed limit, stay in the right lane or brake to avoid collisions because they find it dangerous, distracting or useless, according to new Which? research

Function Robustness

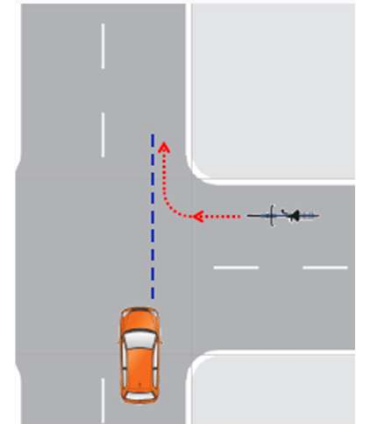
Pass in test track...

Metrics	Warn. Act.	Haptic	AEB Act.
Time [s]	2.55	2.57	2.59
TTC [s]	1.95	1.93	1.91

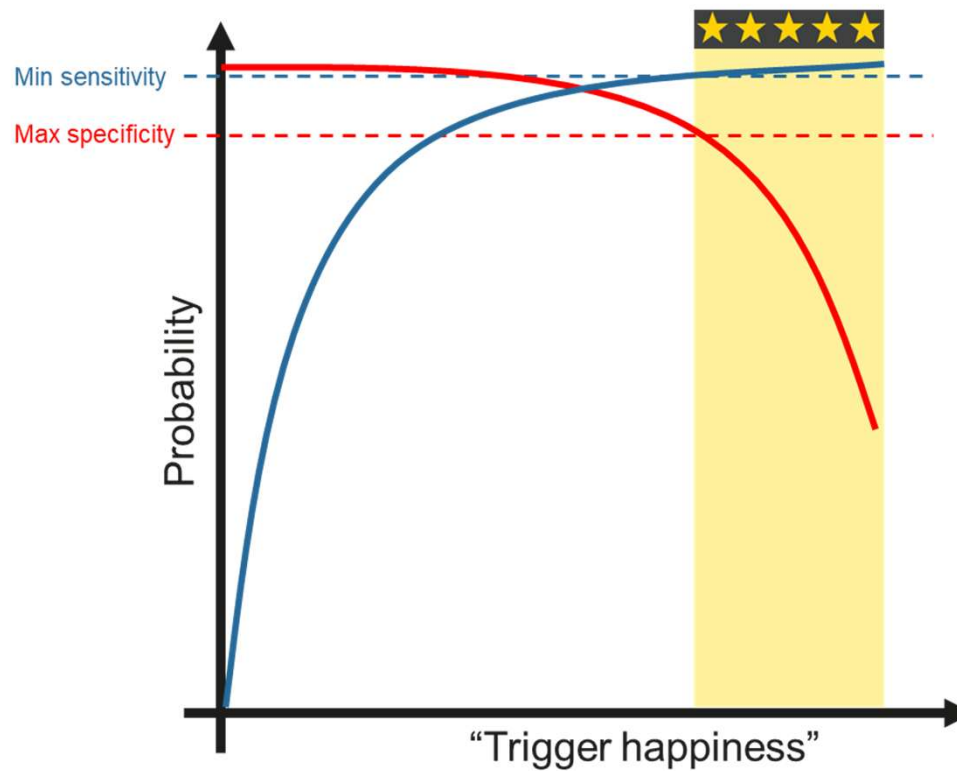


Function Robustness

...pass in real life?



Performance Balance

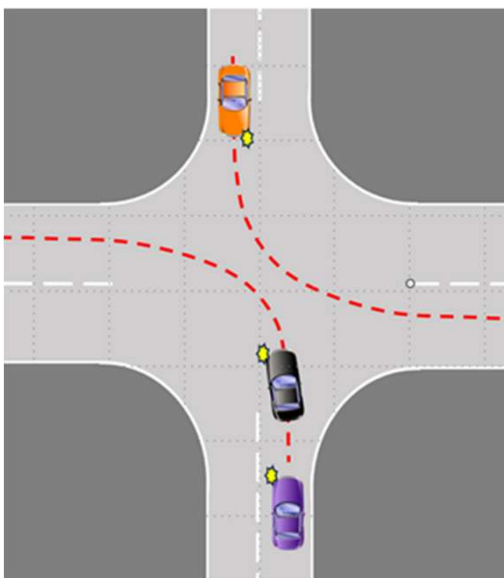


Credit to **OEM X** for the
'Trigger happiness' diagram

Performance Balance

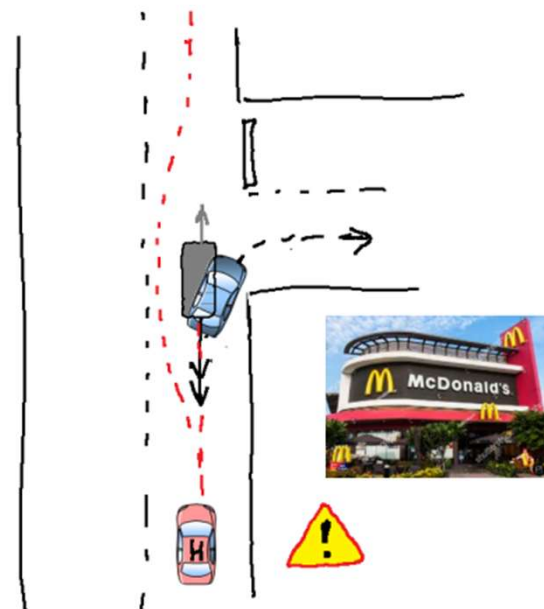
Enabling Balanced Performance by facilitating **context**:

a) Infrastructure (traffic rules)



“Not a Turn Across Path”: orange vehicle must turn left, it can be assumed that it won't continue straight

b) Driver awareness (attentive/distracted)



“McDonald's turn”: a simple situation, hard to predict without knowledge about driver awareness

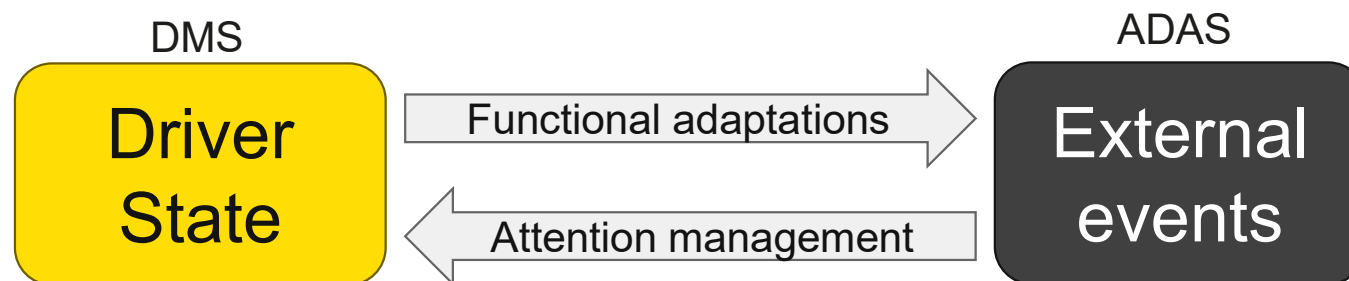
Driver Engagement – 2029 Roadmap

Task Group / Section	Task ID	Task title	Description	Lead	Start	End
DM: Validation & impairment	1a	Dossier streamlining	Delete/reduce/standardise DSM dossier; prioritise objective evidence and repeatable methods.	Euro NCAP	2025 H2	2027 H2
DM: Validation & impairment	1b	Synthetic data	Develop assessment process including performance predictions in ranges, range definitions, parameters to be used, and score distribution. Note: test procedure to be defined in the VTA WG.	Euro NCAP	2025 H2	2027 H1
DM: Validation & impairment	1c	Impairment verification	Develop objective verification for sleep onset (replace subjective KSS-only assessment); include fatigue ramp-up and micro-sleep detection windows.	AstaZero Euro NCAP	2025 H2	2026 H2
DM: Validation & impairment	1d	Sensing quality	Research impairment detection solutions that are more accurate (e.g., DADSS-style touch/breath sensing). Sudden sickness (e.g., loss of consciousness) detection.	Trafikverket	2025 H2	2026 H2
DM: Consumer acceptance & ADAS effectiveness	2a	False Positive validation on-road	Develop assessment process to flag driver acceptance issues annotated during on-road drives (e.g., nuisance alerts).	UTAC	2026 H1	2027 H2
DM: Consumer acceptance & ADAS effectiveness	2b	Warnings & interventions	Review current vehicle response strategies to avoid driver acceptance issues. Investigate positive alternatives to encourage engagement instead of penalising disengagement (attention management).	Euro NCAP	2026 H1	2026 H2
DM: Consumer acceptance & ADAS effectiveness	2c	Redefine attentiveness beyond gaze metrics	Incorporate object monitoring (driver must be aware of path objects instead of just eyes on-road) tied to ADAS interventions / warnings.	T2 Group Euro NCAP	2026 H1	2026 H2
GVC quality and usability	3a	Interaction quality	Add assessments for voice and multimodal controls (latency, speech recognition reliability, fallback to hard controls).	GDV	2026 H1	2026 H2
GVC quality and usability	3b	GVC & DM coupling	Link distraction-by-design and Driver Monitoring assessment and scoring.	Euro NCAP	2026 H1	2026 H1
GVC quality and usability	3c	Usability on-road	On-road evaluation of time-critical tasks (e.g., wipers, HVAC set-point, demist) using gaze metrics and task time envelopes.	GDV	2026 H1	2027 H2
GVC quality and usability	3d	Personalisation	Consider user-specific profiles via e.g., personal keyfob for keeping critical controls predictable and consistent across sessions.	ACEA	2026 H1	2026 H2

Driver Attentiveness – 2029 Framework

Goal

Move from generic distraction warnings to risk-based support:



- › **Functional adaptations:** Maximizing ADAS effectiveness while keeping low FP/nuisance
- › **Attention management:** Ensuring that DMS supports and does not annoy

Driver Attentiveness – Transient Warning Timings

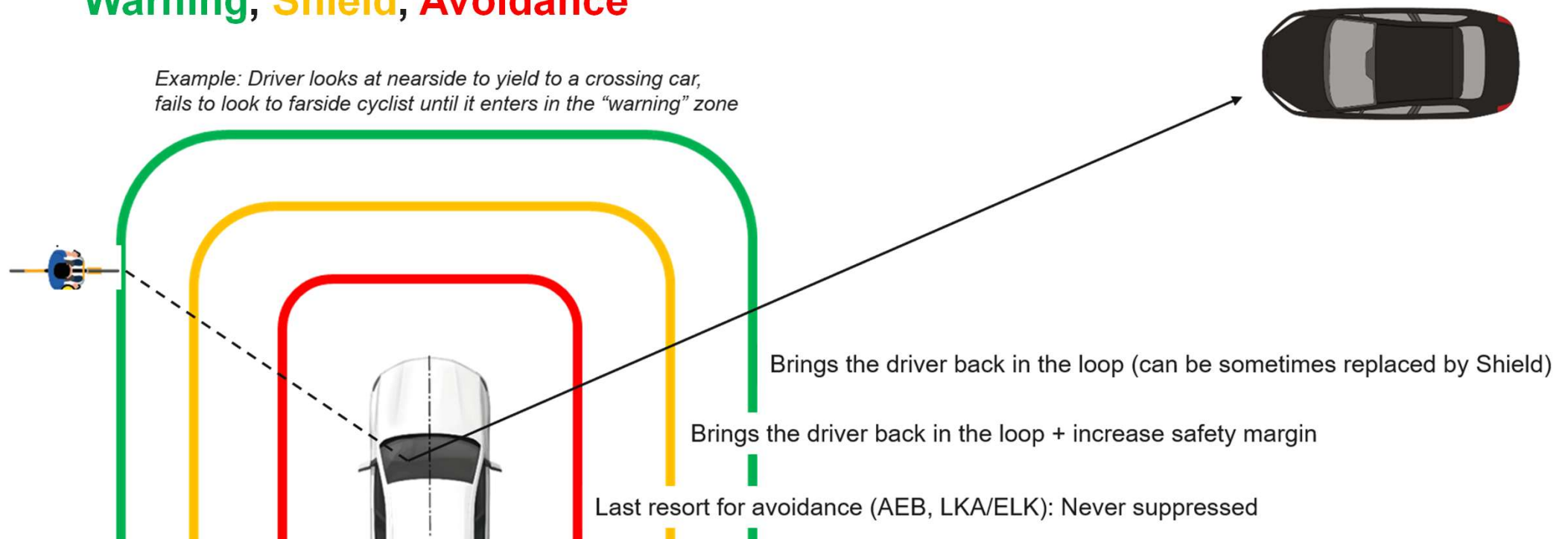
Transient States	2023	2026	2029 	2032 
Short glance off road (≤ 1 s)	Higher FCW & LDW Sensitivity	≥ 200 ms difference in FCW for <u>longitudinal</u> conflicts, LSS adaptations	Last point to brake or last point to steer + (distracted) driver's reaction time for <u>all</u> scenarios, LSS adaptations	
Long Glance Away (LGA)	3 s.	3 – 4 s.	External Risk-based	
Visual Attention Time Sharing (VATS)*	All tasks	Non-driving related tasks, Phone Use	Phone Use	
Fail to Look (FTL)	-	-	Threat in collision path and with high angle relative to driver's gaze	
Looked but Failed to See (LFTS)	-	-	-	Threat in collision path and within driver's gaze

* e.g., 10 s. accumulated within 30 s. window

Driver Attentiveness – Fail To Look

Warning, Shield, Avoidance

Example: Driver looks at nearside to yield to a crossing car, fails to look to farside cyclist until it enters in the “warning” zone



Technical deep-dive + discussion in tomorrow's presentation!

REAL

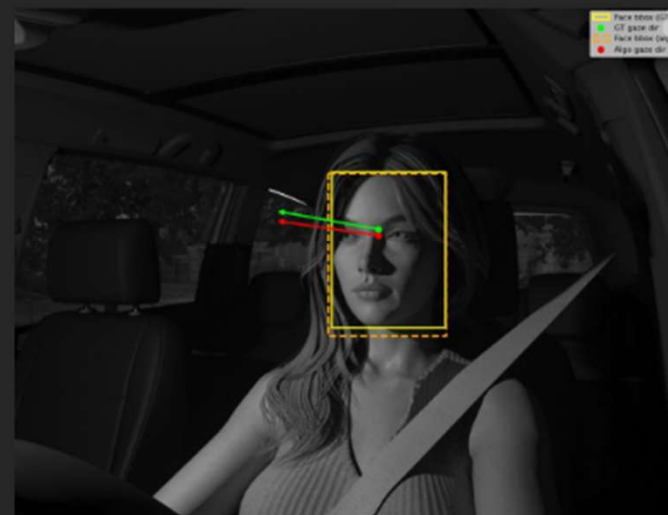
SYNTHETIC

long_disraction_CC_2



7th-sequence

long_disraction_CC_1



5th-sequence

On-road evaluation

Real-world ADAS performance insights

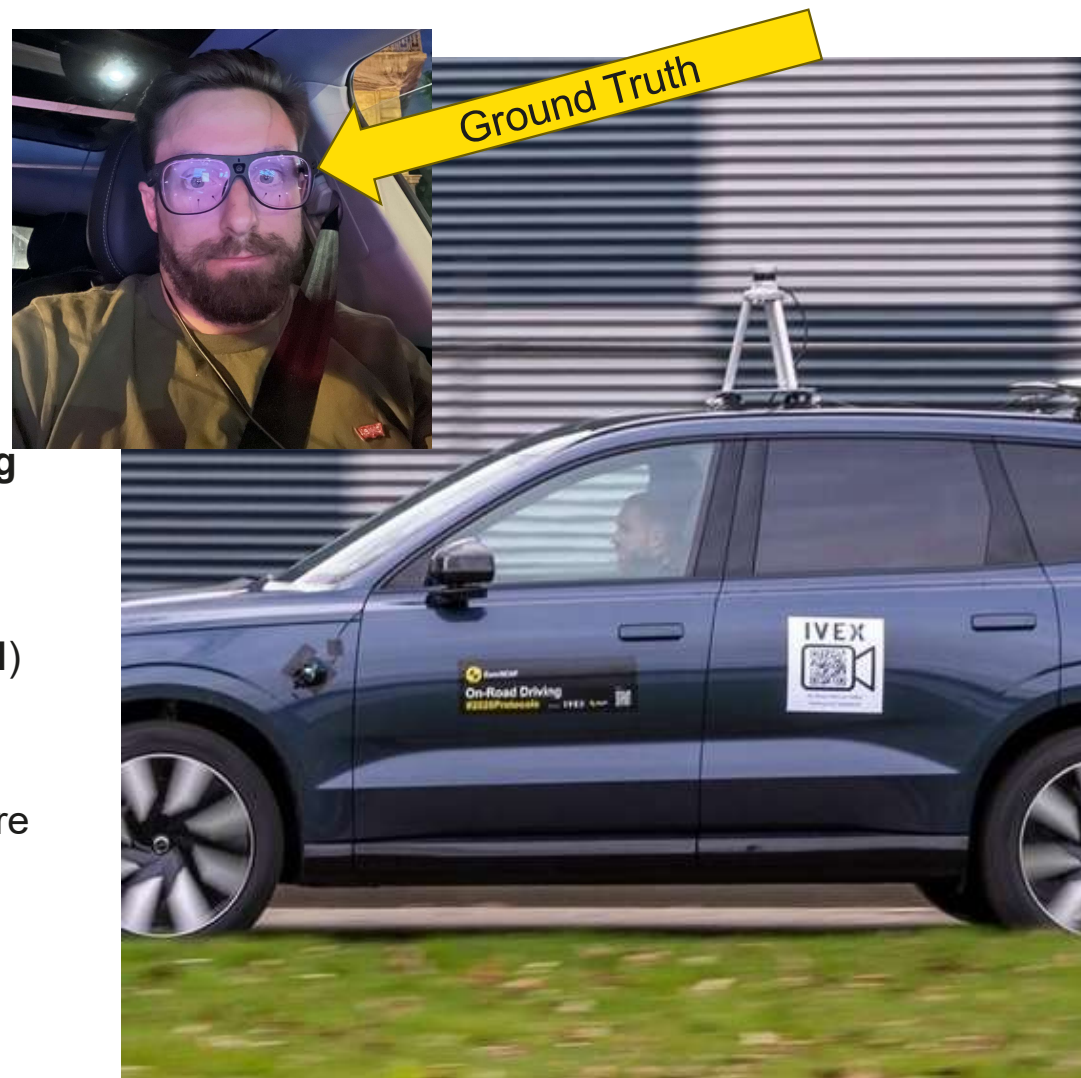
>2000 km naturalistic driving on public roads.

Calculating **SLIF Accuracy**, but also **monitoring relevant events** for other functions **beyond nominal conditions**:

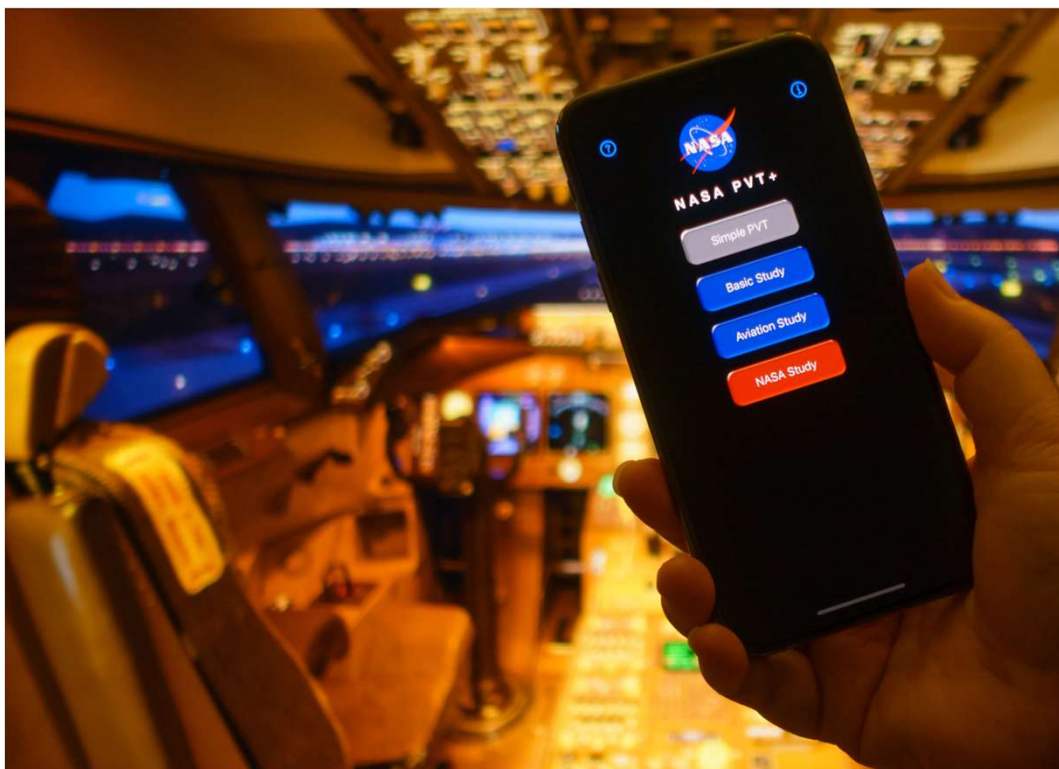
- › Driver acceptance issues (**FP**)
- › Perception and actuation performance (**TP, FN**)

Event annotation possible under noise factors:

- › **Driver Monitoring**: nighttime, direct sun glare
- › **ACC**: water splash, nighttime, object appearance, clutter
- › **Lane Centering**: system uptime



Impairment verification



Scope & Goal

› Scenario-based, naturalistic assessment of **drowsiness detection robustness**.

Objective reference

› Psychomotor Vigilance Task (PVT), one of the most established objective measures of **degradation in vigilance** and **readiness to respond**.

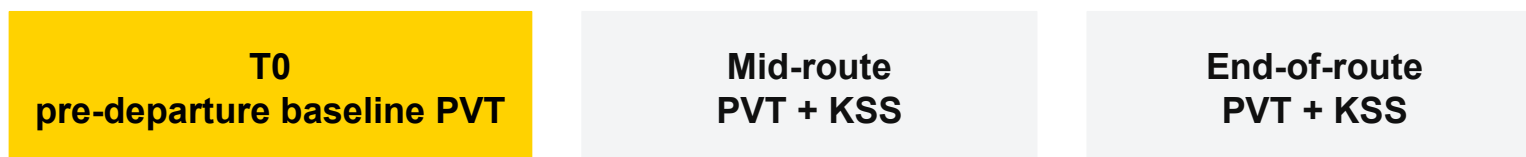
Assessment

› Annotating **FN** and **FP** during on-road evaluation, with 10-min PVT as a reference.

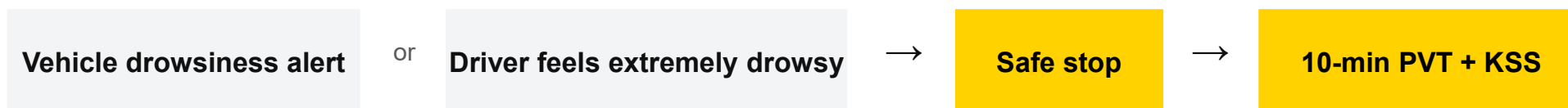
Impairment verification

(10-minute) PVT Validation Pilot - Methodology

Scheduled reference points



Event-contingent tests



The modern car paradox

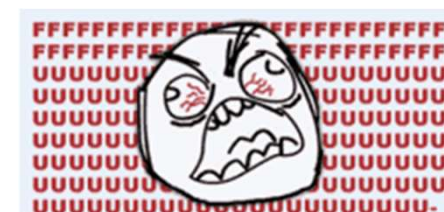
› Driver wants to change temperature...
poor UX forces driver's **gaze off-road** for a few seconds...



› ...Driver Monitoring System issues an **LGA distraction alert**...



› ...Driver regrets buying a new car with 'life-saving' tech ;-(



Poor UX design should not lead to reaching Driver Monitoring warning thresholds

General Vehicle Controls

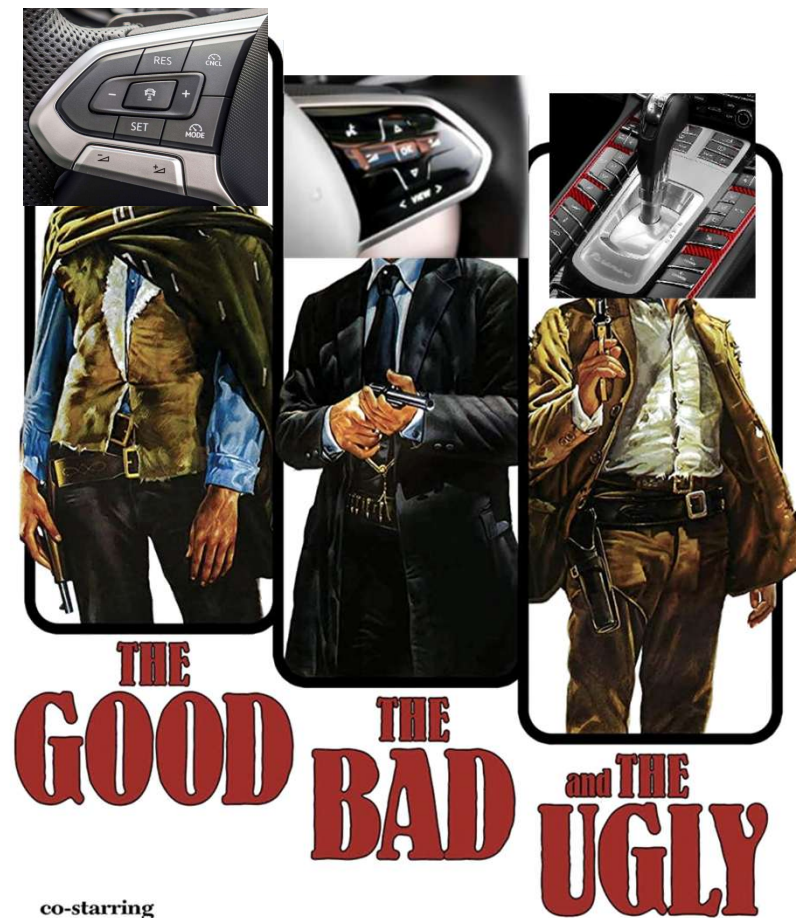
2026

Interaction modality requirements for controls across most common tasks

2029

Focus on interaction quality

Introducing backstop for distraction warnings during normal controls interaction



In memoriam – Colin Barnden



About Euro NCAP

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

Euro NCAP is a catalyst for encouraging significant safety improvements to new car design. **We hope that you will choose for safety.**

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