

Euro NCAP 2029 Driver Monitoring Assessment Framework for Mitigating Driver Inattention Risks



Euro NCAP
Driving a Safer Future

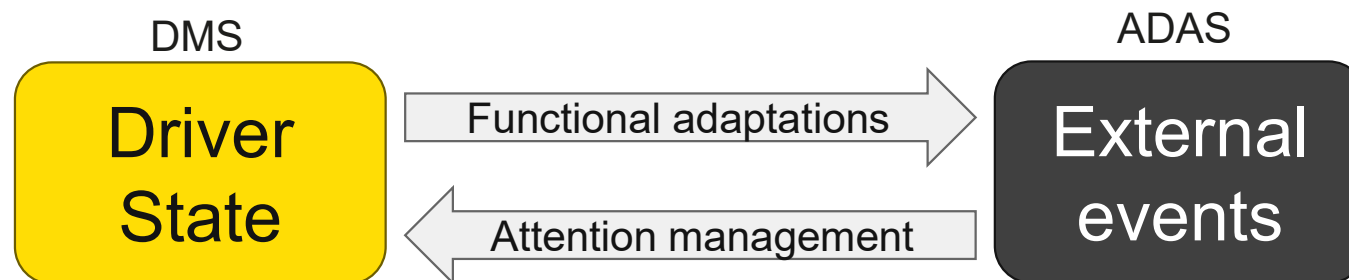
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21/10/2026



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

The modern car paradox (Pt.2)

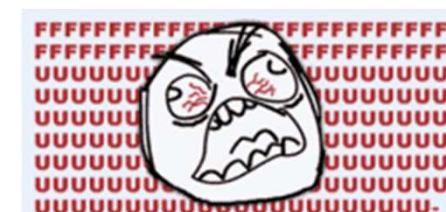
› Driver follows car navigation instructions while conducting over the shoulder and rearview mirror checks



› ...Driver Monitoring System issues a **distraction alert**...



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



Reimer et al (2026): Attentional countermeasures should be **context-sensitive**, consistent with natural driver behaviour, proportional to urgency, coordinated with other alerts and designed to support consumer acceptance.

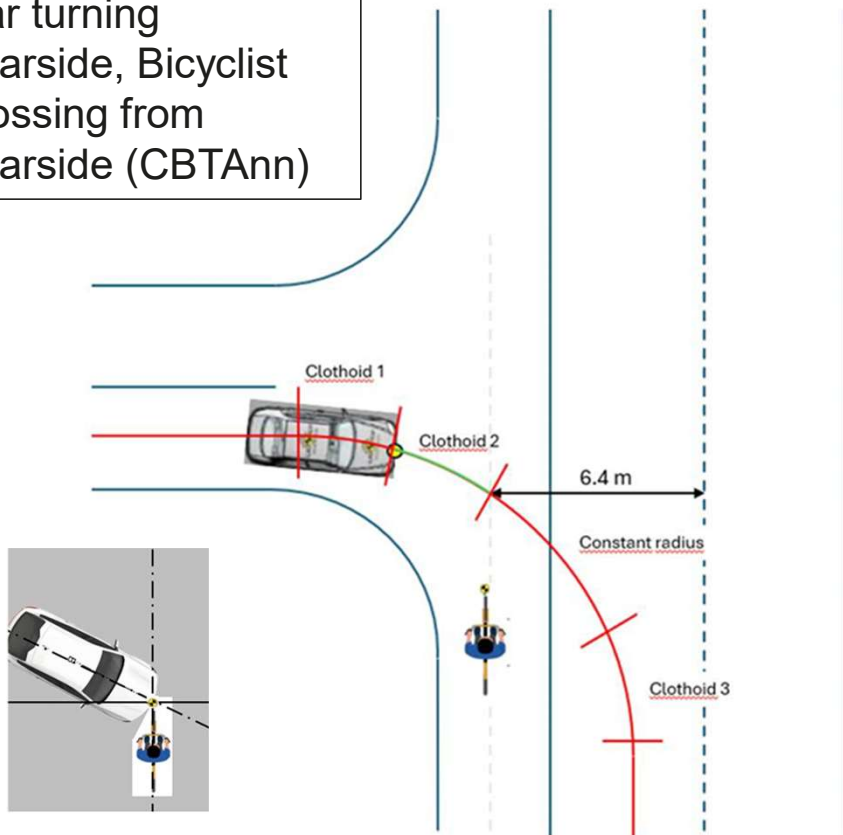
Driver Attentiveness – Transient Warning Timings

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> conflicts, 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

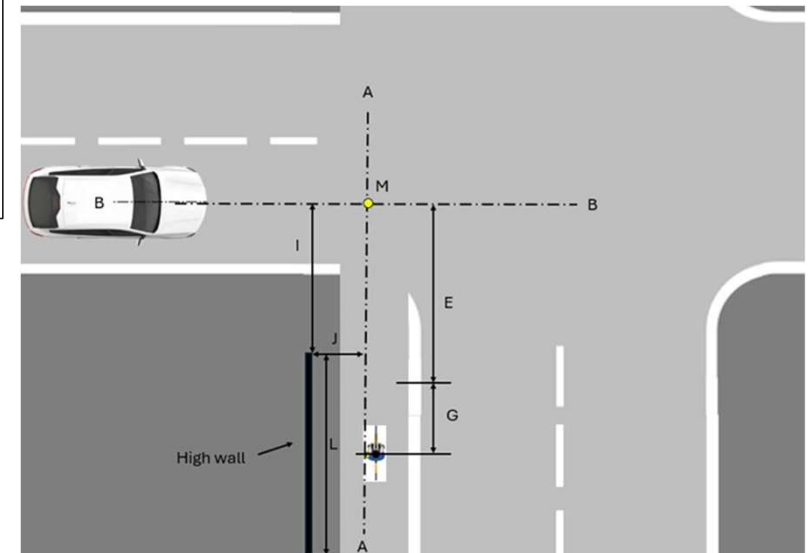
* e.g., 10 s. accumulated within 30 s. window

Driver Attentiveness – Fail To Look

Car turning
nearside, Bicyclist
crossing from
nearside (CBTAnn)



Car crossing
straight, Bicyclist
crossing from
nearside (CBNA)



These are among the most common car-to-bicyclist crash types identified in European crash data!

Driver Attentiveness – Fail To Look

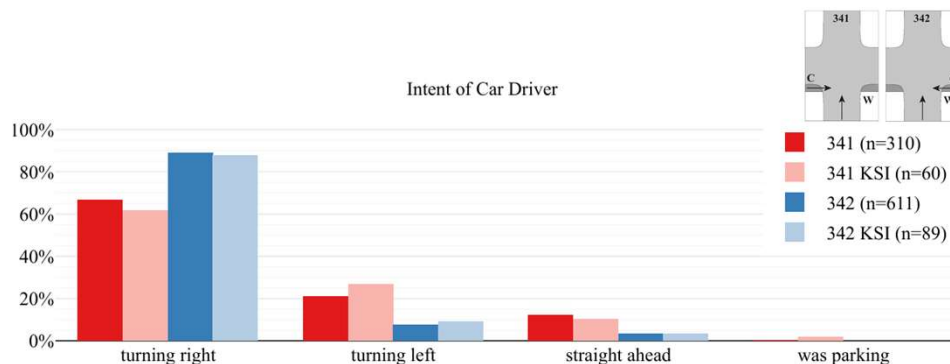
A driver can look at the road and still miss crossing traffic

› [Gohl et al. \(2016\). Car-to-cyclist accidents from the car driver's point of view:](#)

- › Fail to look: cyclists approaching from the **right**, Looked-but-failed-to-see mechanism may be more relevant for cyclists from the **left**.

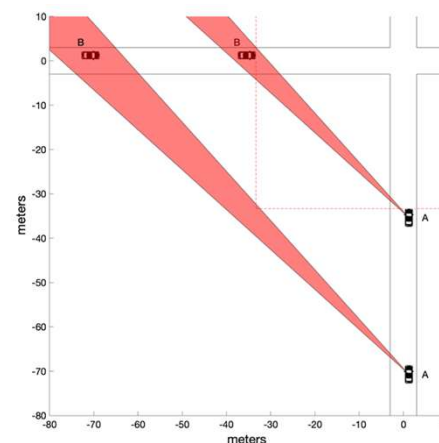
› [Puller et al. \(2023\), GIDAS car-cyclist collision analysis:](#)

- › Most crashes occur when driver must yield and turns **right**, with the cyclist coming from the **right**. Most cases **unobstructed**.



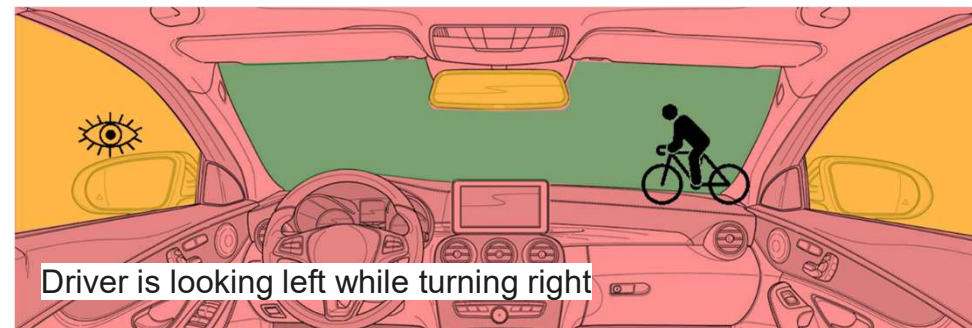
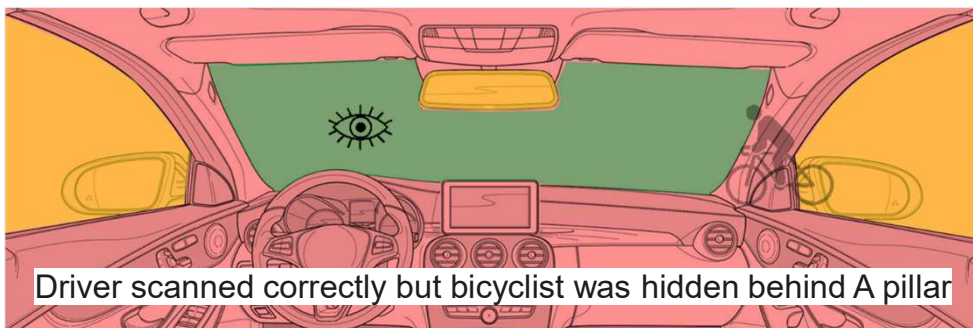
› [Ekroll et al. \(2021\), The Illusion of Absence:](#)

- › Constant-bearing collision trajectories can make A-pillar obstruction problematic.



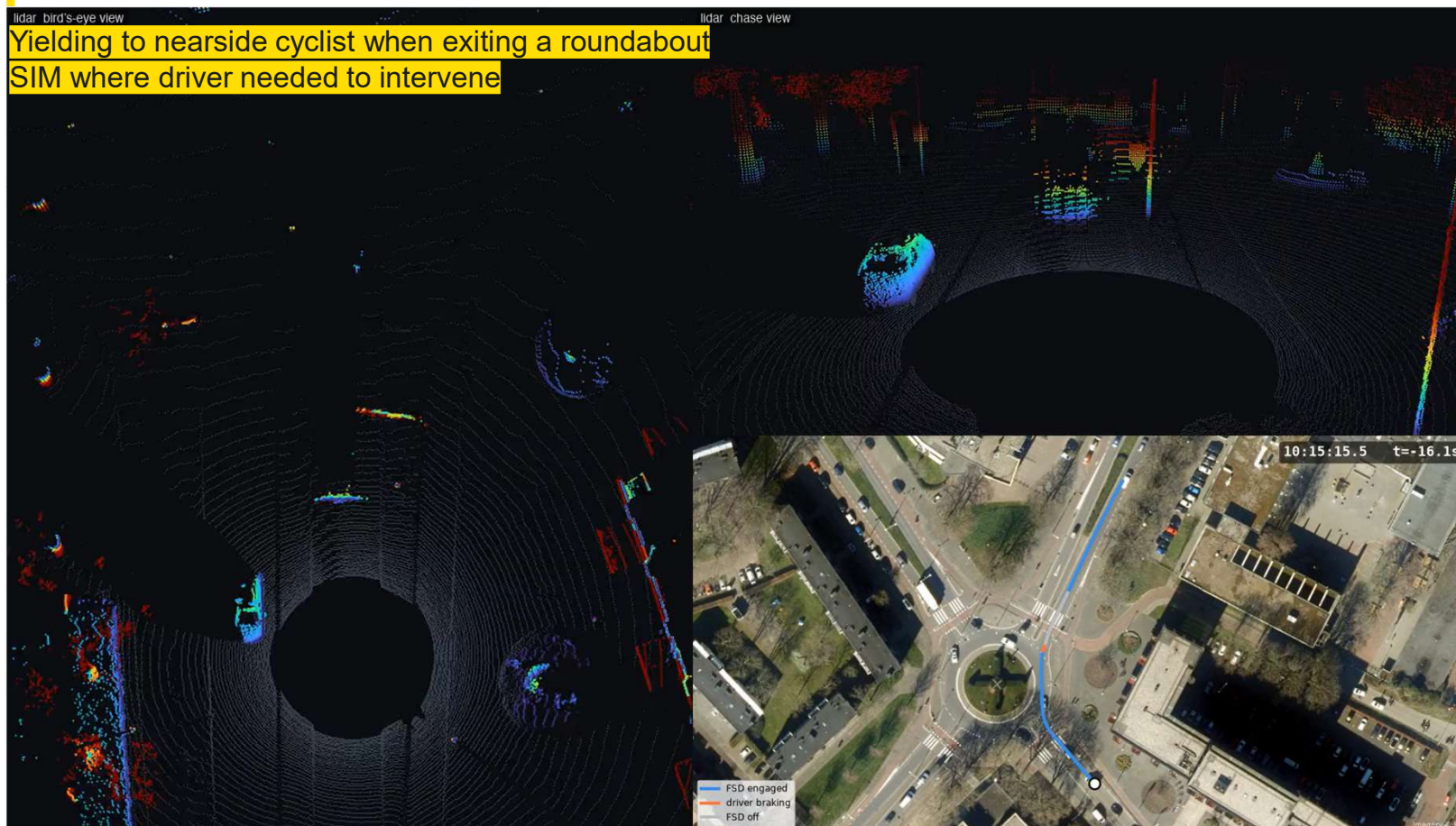
Driver Attentiveness – Fail To Look

Different mechanisms through which crossing threats can be missed



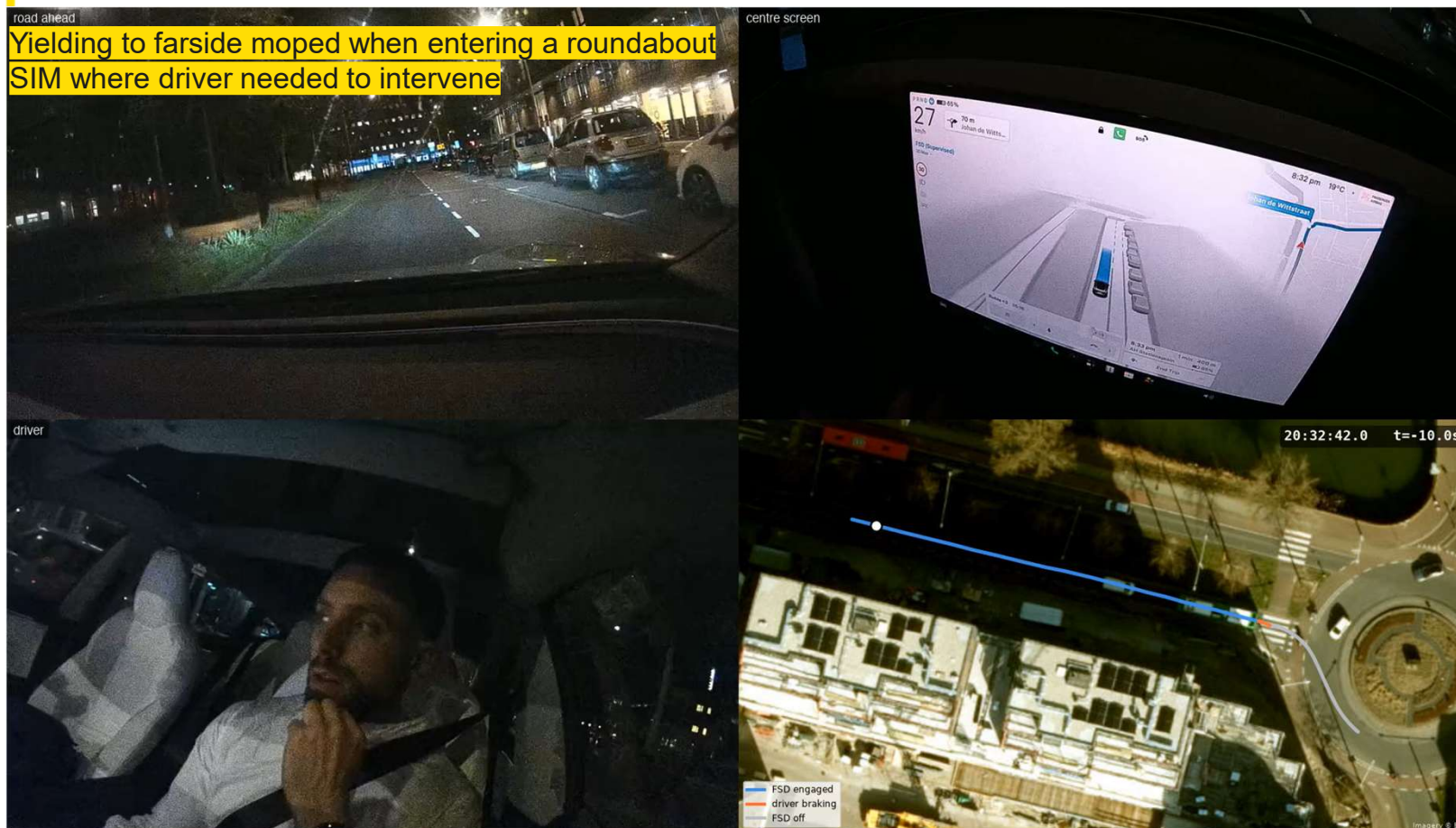
All situations are speed-dependent!

Driver Attentiveness – Fail To Look



- ✓ This situation forces a very high gaze angle, whereby the driver must look beyond the right A-Pillar to assume (s)he has perceived the cyclist
- ✓ System Initiated Manoeuvres (**SIM**) in urban environments should consider this gaze behaviour to secure **driver engagement**

Driver Attentiveness – Fail To Look



- ✓ Depending on the speed and angle, the moped may stay obscured **behind driver's side A-Pillar**.
- ✓ Even when the moped is beyond the A-Pillar (this situation in particular), the driver must look **at least once** to the moped to assume (s)he has perceived it.
- ✓ System Initiated Manoeuvres (**SIM**) in urban environments should consider this gaze behaviour to secure **driver engagement**

Driver Attentiveness – Fail To Look

Central vs Peripheral Vision re: hazard detection and perception

› Central vision (high-confidence identification):

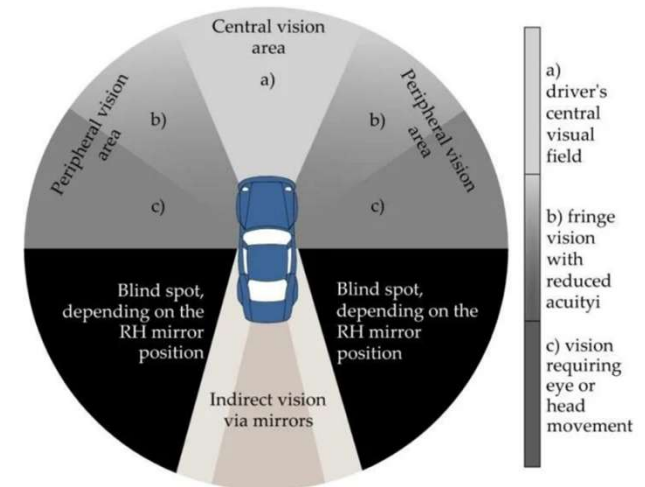
- › ~15–30° each side of gaze direction
- › Sharp detail, object recognition
- › Where drivers confirm hazards

› Peripheral (early detection / cueing)

- › ~90–100° each side of gaze direction
- › Good for motion detection, less so fine detail
- › Supports attention cueing (e.g., pedestrian stepping out)

› Practical implication:

- › Peripheral threats are typically first detected through peripheral vision, then attention is directed toward the threat so it can be perceived centrally.



Driver Attentiveness – Fail To Look

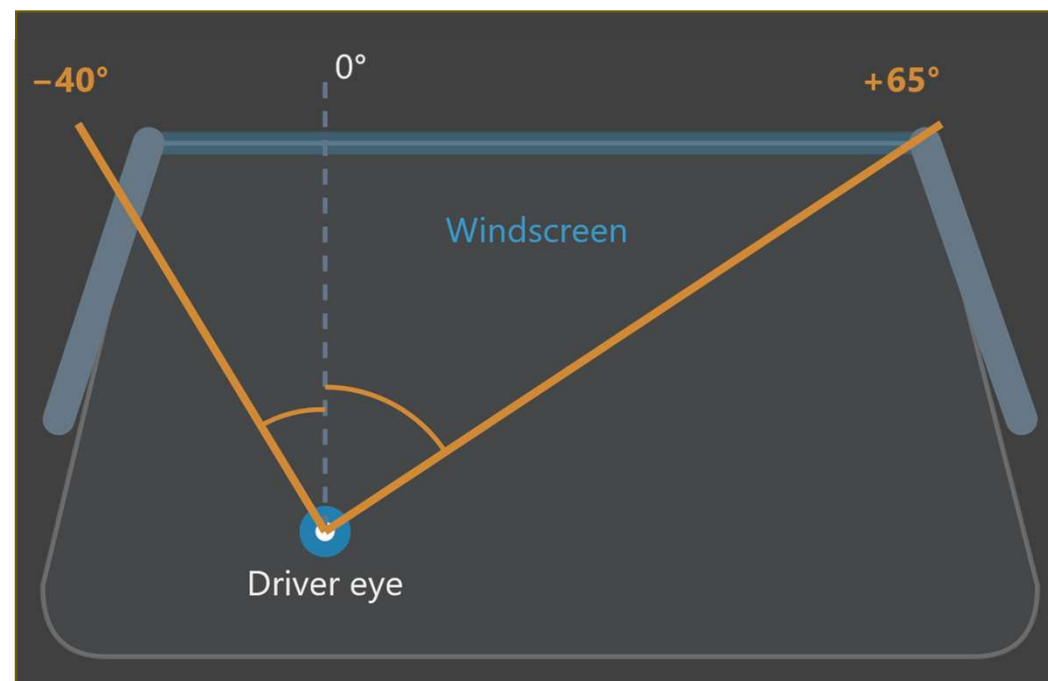


FTL – Gaze angle vs Object

› Need to start with a **simple approach** that covers **most cases**.

› Most common **A-Pillar position** versus **driver's horizontal eyeline** reveal it's possible to look left within the windshield and **not perceive** crossing objects from the right (Gaze angle vs Object $\geq 90^\circ$)

› However, drivers looking straight ahead may also fail to acquire crossing threats **beyond the A-pillars**, even when gaze-to-target separation is less than 90° .



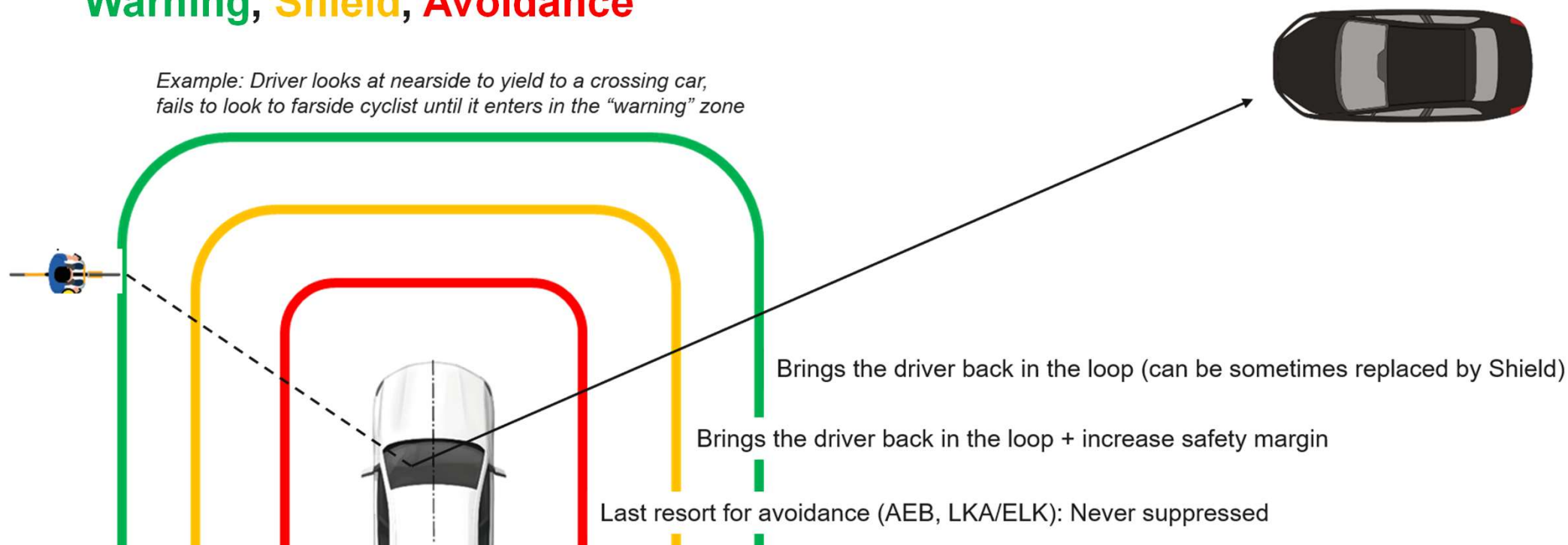
Top view schematic of a typical passenger car (illustrative, not to scale)

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



To be continued... please get in touch before Dec'26 if you want to give us a hand!

About Euro NCAP

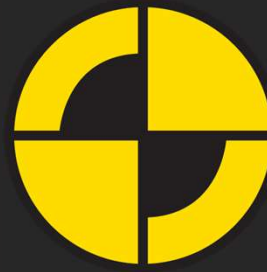
Euro NCAP provides consumers with an Independent assessment of the safety level of the most popular vehicles sold in Europe.

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

Contact Us

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