



# Direct driving field of vision: Toward a Field of View Assistant (FOVA)

UN Regulation No.125

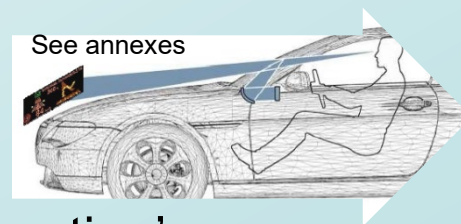
# Direct driving field of vision, Regulation n°125

## Aim of the presentation:

1. Sharing information on Field of View Assistance (FoVA),
2. Clarifying regulatory compliance of 'augmented reality' augmenting driver's direct view.

## Background:

- Around the 2000's, introduction of Head Up Displays (HUD) led to clarify 'obstruction'  
This clarification enabled innovative HMI solutions for safety benefit:
  - a. 2002: in Europe, TAAM refers to EU Statement of Principle.
  - b. 2010: EoF of UN R125.00 Suppl. 03 introducing 20% allowed obstruction of S zone (between -1° and -4°)
- 10 years later, thanks to consumer interest, OEMs propose additional information assistance.



→ 2020': FOVA for augmented information to the driver seeks agreement on regulatory compliance.



# Field of View Assistant (FoVA)

**Question:** Can a field-of-view assistant further improve road safety?

**Answer:** BAST study on FoVA (Report No. 127, published in April 2019\*) gives a clear answer

“Coherent with expectations, the results show that both age groups (remark: young and elderly driver) responded faster to cars in the periphery in trials with a centrally located warning....

**Thereby, a field-of-view assistance renders to be a promising approach** from the perspective of perception psychology, and has proven feasible in the simulator while producing good results: In both experiments, positive effects of the **centrally positioned warning** presented when cars appeared peripherally, were found for both participant groups.”

**Limitation from OEM's experience:** FoVA (including augmented reality) is considered as 'obstruction' by some Contracting Parties, i.e. not complying to UN R125.

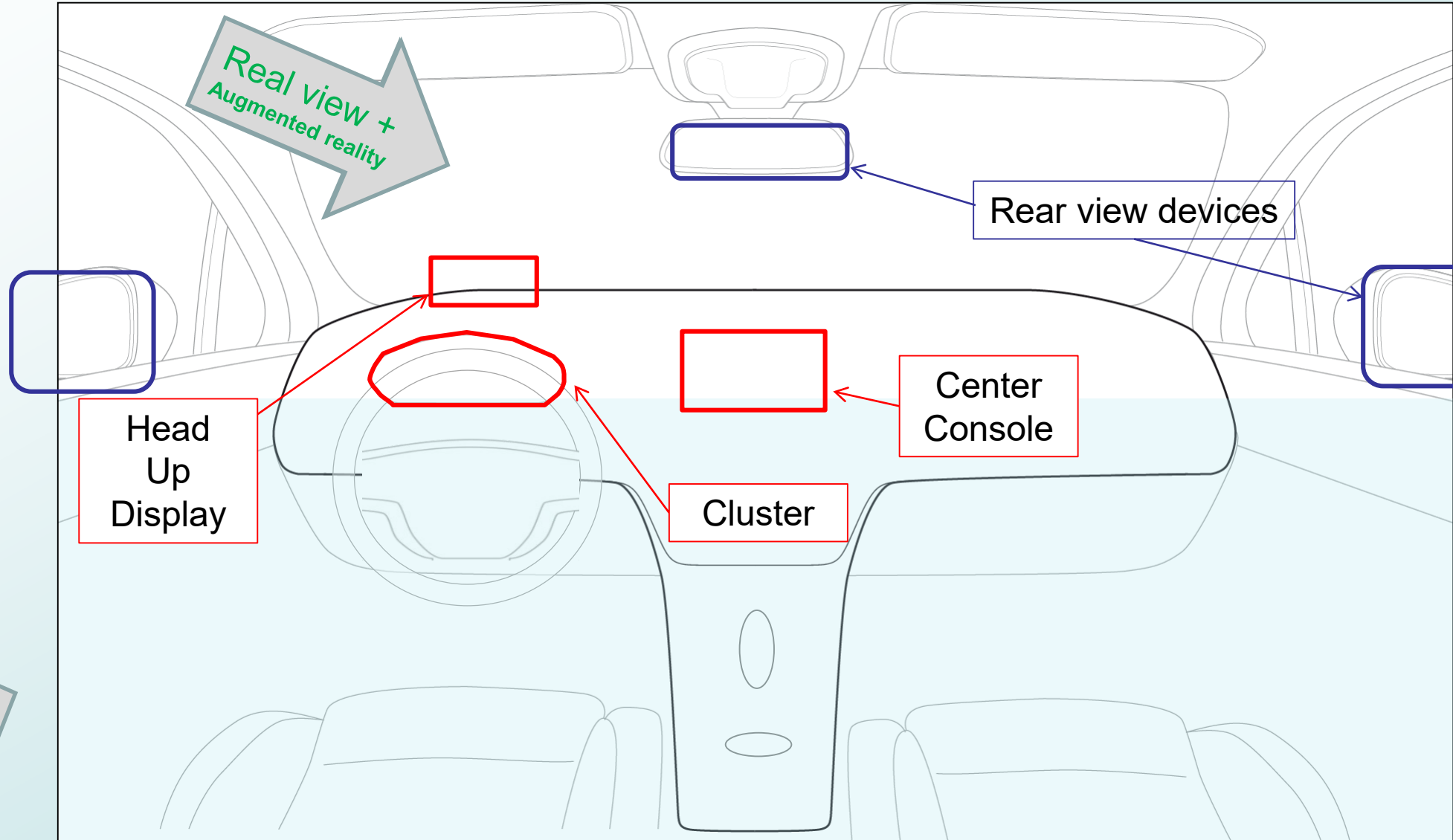


# Field of View Assistant (FoVA)

## Advanced Driver Assist Systems

providing multiple information to the driver, either:

- a. Haptic
- b. Audible
- c. Visual





# Field of View Assistant (FoVA)

## OICA position on Augmented Field of Vision

FOVA is beneficial to safety and regulatory compliant if:

1. Light Transmission complies to harmonized regulation  
UN R43:  $LT > 70\%$
2. Direct view obstructions comply to Regulation UN R125, with additional **overlay relevance** in case it appears above  $-1^\circ$  (plane set from eyes positions):
  - a. FOVA must highlight real view and never mask it,
  - b. FOVA must not be permanent,
  - c. Light intensity/contrast must be tunable to driver's convenience
  - d. Display reliability/relevance must satisfy best standards (no excessive information, no missing information).



See examples 1 and 2



See examples 3 and 4



# Direct driving field of vision, Regulation No.125

## Elements of discussion:

- Field of View Assistant, including augmented reality, is a **means for safety** benefit
- Augmented Field of Vision (AFV) is **not defined in UN R125** but is expected to provide the same beneficiary step as Head Up Displays did.
- Augmented Field of Vision (AFV) must comply with relevant design requirements:
  - Should support the addition of **relevant driving information** (increase driver's awareness ; avoid driver distraction)
  - May merge relevant information in the mandatory **Field of Vision**.
- Uncertainty as to whether Type Approval Authorities can support agreement on regulatory compliance.

## Expected GRSG guidance:

1. Is Field of View Assistant (FoVA) of safety benefit?
2. Can GRSG reach a consensus position on Augmented Field of Vision (AFV) ?



Examples,



## Example 1

### AUGMENTED REALITY

features on highway



Navigation

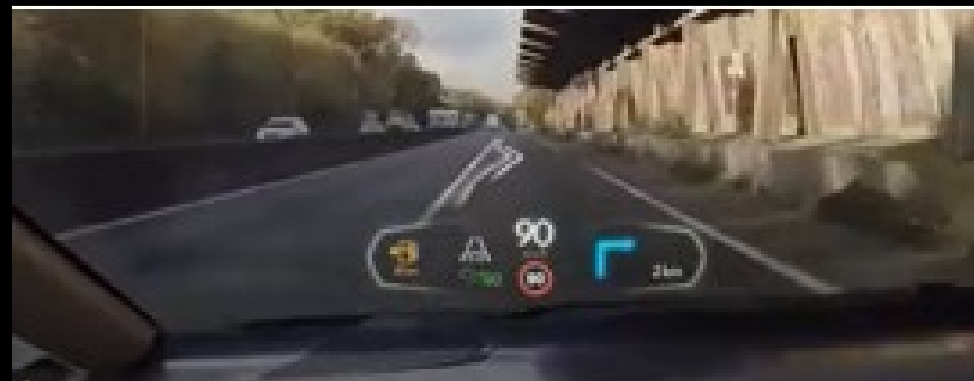
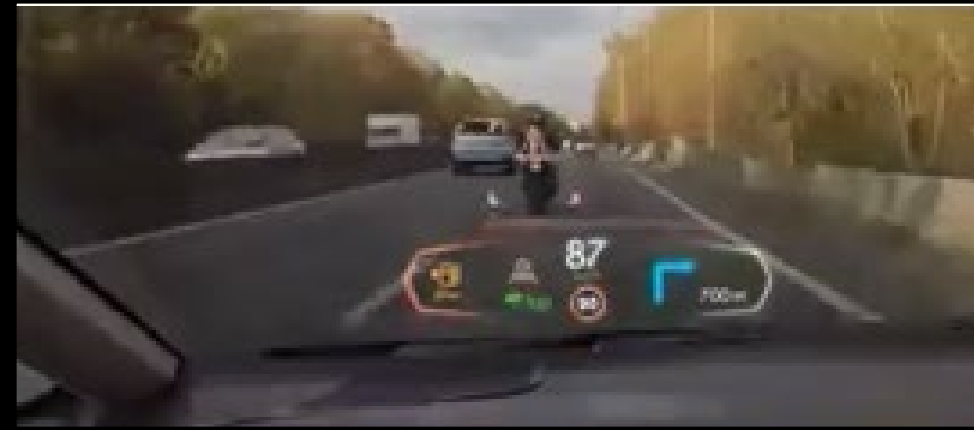


Adaptative Cruise Control



Lane Keeping Assist

# Field of View Assistant (FOVA)



Source: PSA - 2015





## Example 2

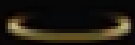
### AUGMENTED REALITY features in town



Navigation



Obstacle warning



Pedestrian detection

## Field of View Assistant (FOVA)



Source: PSA - 2015





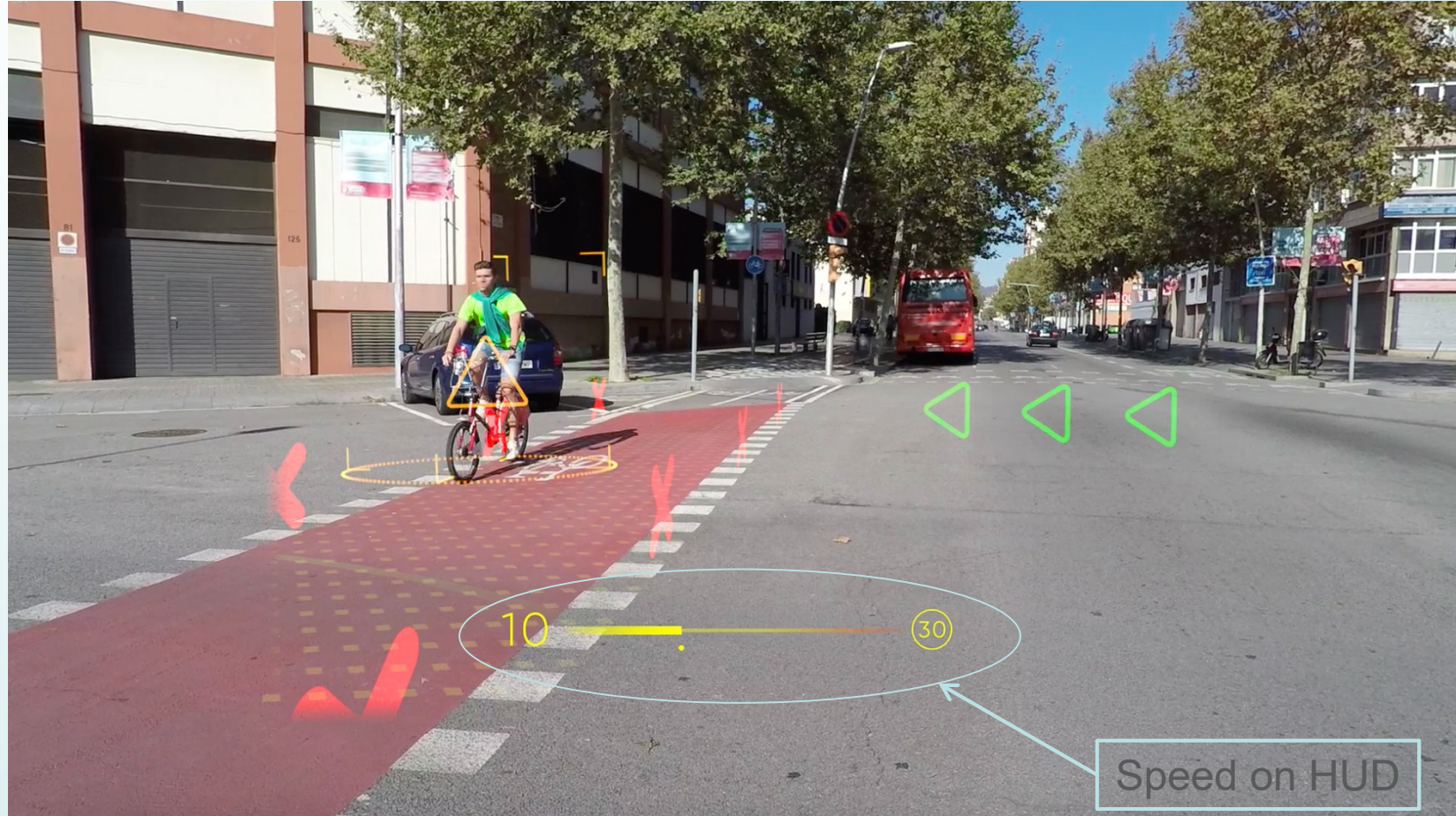
# Field of View Assistant (FOVA)

## Example 3

Overlaying driver relevant information in the field of vision

1<sup>st</sup> aim is safety: increase driver awareness

Overlaying lines and characters



**Avoid driver distraction:** no room for non 'driving relevant information' e.g. entertainment, advertisement

Driver navigation and warning:

- Highlighting vulnerable road users (here cyclist)
- Blocking the road (here with red **X**)



# Field of View Assistant (FOVA)

## Example 4

Overlaying driver relevant information in the field of vision

Next's:

- Information,
- Entertainment (AD)

Overlaying road surface coloured-3D



Hotel location and itinerary, Free park places...: must remain driving relevant information



Navigation: coloring the road surface without covering objects (here trees)



Thank you for your attention



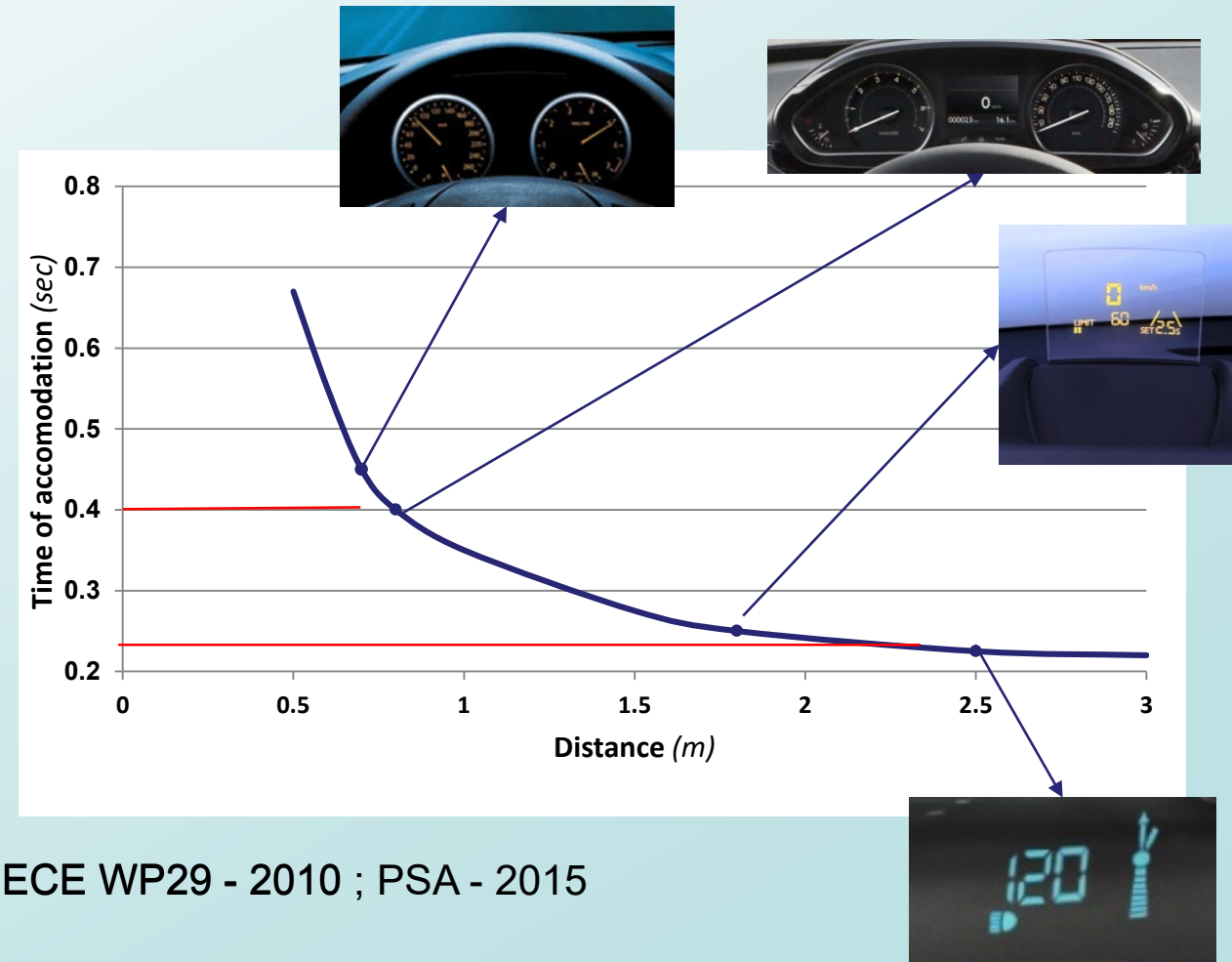
Annexes,



# Situation 2010:

## Head Up Displays (HUD) to shorten accommodation's time

- a. After discussions in the early 2000' on direct field of vision obstruction risk, in case of information presented above cluster, European Type Approval Authorities (TAA) agreed on the safety benefit of best practices to present **information in front of the driver**, limiting head move and accommodation time, and referred to recommendations (Statement of Principle, SoP) for conformity criteria.
- b. December 2010, UN WP29 adopted supplement 3 to the original series of regulation n°125, introducing 20% allowed obstruction in the S zone defined in the field of vision between  $-1^\circ$  and  $-4^\circ$ , hence allowing cluster to raise above steering wheel.



Sources: TAAM - 2002 ; UN ECE WP29 - 2010 ; PSA - 2015



# Situation today:

## Accidentology: UN Global status report on road safety 2018

WHO's report highlights .. the disproportionately burden borne by pedestrians, cyclists and motorcyclists.. (price is too high.. proven measures exist). Drastic action is needed.. with main findings:

a. Car occupants continue to benefit most from road safety improvements,

Safer vehicles to the fleets, equipped with technologies that prevent crashes (such as Electronic Stability Control) or mitigate their consequences (e.g. airbags) contribute to this improvement.

b. The number of vulnerable road users killed increased in many countries,

Pedestrians, riders of powered two-wheelers and cyclists represent now more than half of the total number of road deaths. Each respective share of all traffic fatalities rose since 2000.

c. The rise of distracted driving, while using smartdevices.

Empirical evidence is patchy in the absence of standardised data to monitor the impact of distraction on driving. .. available information supports the view.. that **distracted driving is developing into a major road safety risk ..**

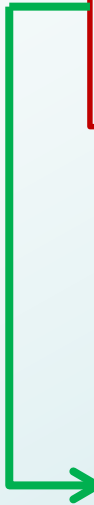
**Recommendations** foster seatbelt and helmet use, but highlight main issues on **Alcohol** (aim for a systematic alcohol testing ; improve harmonized statistics) and **Speed**: set limits based on the Safe System principles (the forces a human body can tolerate and still survive)...



# Situation today:

## The most common mistakes made by drivers leading to an accident with injuries

	Number of accidents	Percentage
Mistakes during turning, returning, ingressing roads..	56.642	15,7 %
Disregarding priority	52.332	14,5 %
Non sufficient distance	50.267	13,9 %
Too high vehicle speed	45.058	12,5 %
Wrong road usage	24.203	6,7 %
Other reasons	132.234	36,7 %
Total	360.736	100 %



Increased Driver Awareness could further reduce the number of accidents

