AV safety: Commission view FRVA
Automated driving: concepts

Manual driving:
Driver drives
- Shall not cause accident
- Respect traffic rules
- Drive carefully
- Allow interaction with other road users

Automated driving: System drives:
- Shall not cause accident
- Respect traffic rules
- Allow interaction with other road users
- Drive carefully
- Inform the driver/passenger
- Is able to detect its limits for activation and minimum risk manoeuvre
Automated vehicles: New risks to be tackled

Operational risks (i.e. driver tasks in manual driving, new AD risks)

Cyber

Mechanical/Electronic failure
Design/Verification/validation by manufacturers

- Need to clarify concepts first: Same words are used with very different meaning
- We should distinguish how these instruments are used by manufacturers and authorities
Safety level

• Overall goal: At least equivalent to human driving

• Not a single criteria but a combination of qualitative criteria (all known unsafe scenarios and most unknown unsafe scenarios shall be managed) and quantitative target for residual risk (equivalent to humans or better)

• Constraints: Balance between safety (focus of authorities) and drivability (also important for manufacturers).

• This implies safety principles and safety capabilities in nominal and degraded conditions as well as a relevant architecture to provide these capabilities.
Safety level: References

• National/regional guidelines

• Safety principles used by manufacturers: ISO 26262 and SOTIF (ISO PAS 21448), FMEA, STPA, etc.

• Safety principles used in other sectors: producer/user is responsible, equivalent level of safety, performance as intended, best effort to avoid accidents, assess/inform about residual risks

• Safety principles can be applied for L3 ALKS similar to general approach but limited number of scenarios: at least equivalent to human driver, risk of misperception, reaction of the system at the edge of the OD/complex situations, risks for driver confusion/disengagement.
EU guidelines on automated vehicles

• **Goal:** Approval under an EU exemption procedure

• **Main safety principles:**
  • 1. SYSTEM PERFORMANCE IN THE AUTOMATED DRIVING MODE (Including Duty Of Care Principles)
  • 2. DRIVER/OPERATOR/PASSENGER INTERACTION
  • 3. TRANSITION OF THE DRIVING TASKS
  • 4. MINIMUM RISK MANOEUVRE
  • 5. INSTALLATION OF EVENT DATA RECORDERS
  • 6. CYBERSECURITY
  • 7. SAFETY ASSESMENT AND TESTS
  • 8. INFORMATION PROVISION TO AUTOMATED VEHICLE USERS
  • ANNEX : INFORMATION TO BE PROVIDED FOR TYPE APPROVAL

• **Supported by Member States on 12 February 2019**

• **Publicly available:** [https://ec.europa.eu/growth/content/guidelines-exemption-procedure-eu-approval-automated-vehicles_en](https://ec.europa.eu/growth/content/guidelines-exemption-procedure-eu-approval-automated-vehicles_en)
•Thank you!