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Vision of an ADS road map and related future activities at UNECE/GRVA

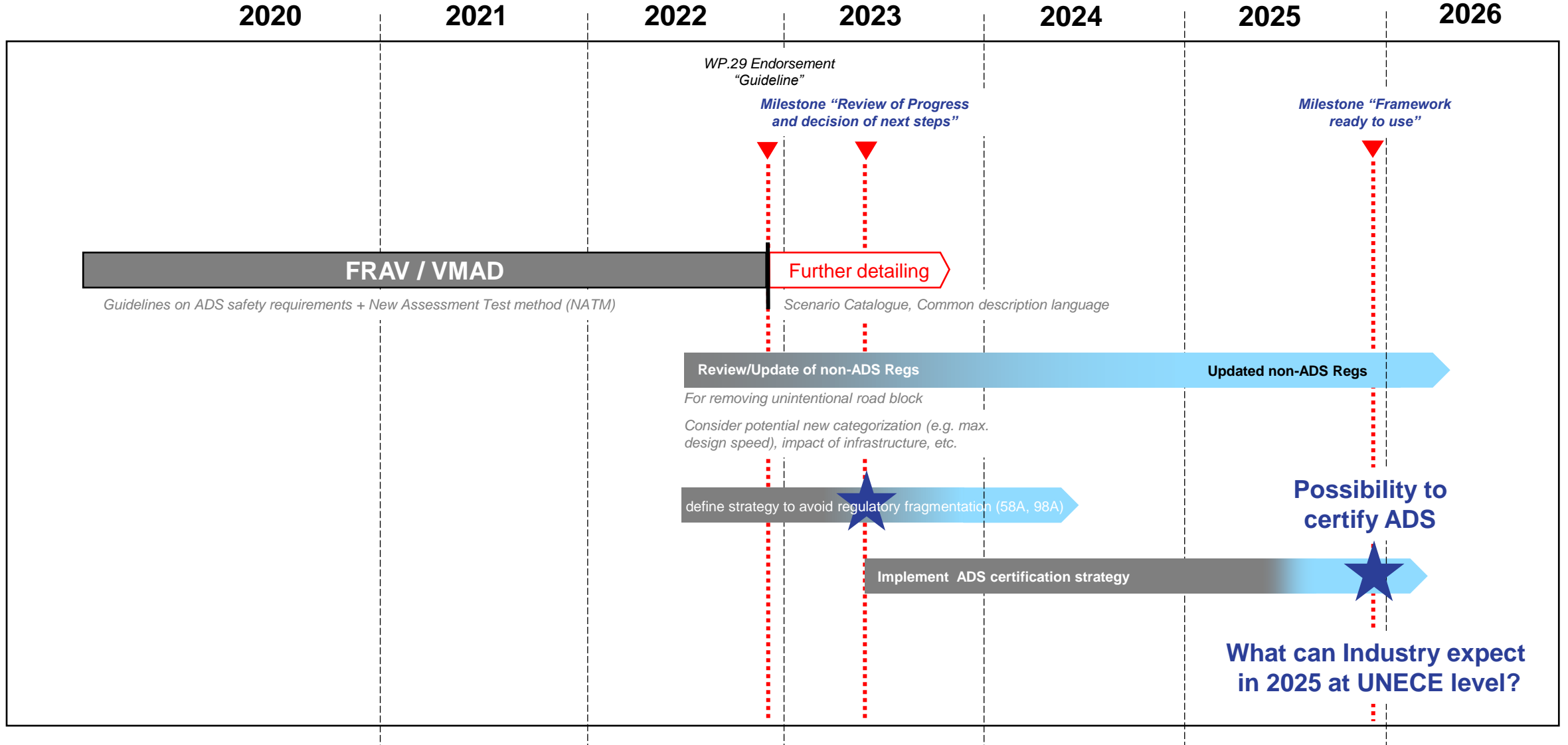
WHAT ARE THE ISSUES WE ARE FACING?

- Industry is getting closer to market introduction of ADS, for some use-cases manufacturers are already waiting for the regulatory environment to be amended in order to allow such ADS being placed on the market and operated
- National/regional activities are initiated/started/ongoing/concluded to address certification of ADS. While this opens opportunities for manufacturers to nationally put systems on the market and gain experience (both: manufacturer and Authorities) it potentially increases the risk of disharmonisation. Therefore, the work at UN level is important to prepare the next step towards harmonized certification requirements for ADS.
- Lack of legal certainty regarding requirements and certification process negatively impact the development of ADS and cause delay (due to consideration of development cycles)

Work streams identified:

- 1) Review and amendment of non ADS Regulations (“make existing Regulations work for AV’s”)
- 2) Development of further ADS details (→ FRAV/VMAD)
- 3) Certification of ADS

AD REGULATORY ROADMAP – A VISION



CONCEPT FOR NON-ADS REGULATION REVIEW

- Main focus shall be on „make the system regulations work for AV’s“ rather than „introduce new concepts“

Example: issue of references to drivers, occupants, seats, etc. to be resolved, not new seating postures potentially of future interest for driverless vehicles (shall not be mixed up, since it may delay the whole process)

- Check whether it would make sense to have different requirements based on different maximum design speed

Example: Urban shuttles operating at (very) low speeds should maybe not required to comply with crash requirements at the same level as Robo taxis driving in a different environment at high speeds.

- Check if requirements are applicable for the various categories of vehicles (carrying no occupants vs. carrying seated and/or standing occupants)

Example: Occupant protection requirements only applicable to vehicles capable of carrying occupants

CONCEPT FOR NON-ADS REGULATION REVIEW

- Identify for each Regulation individually (which requires amendments in order to be applied to ADS equipped vehicles) the most appropriate option, means:
 - a. an amendment of the Regulation is possible to apply it to ADS equipped vehicles (incl. driverless vehicles with/without occupants), or
 - b. creating a new Regulation (e.g. based on the existing Regulation, but with major amendments), or
 - c. creating a new Regulation covering more than one existing Regulation on a specific topic

Examples:

On b): e.g. creating an new UN R79A to be used for Automated/ Driverless vehicles (incl. high speed use-cases)

On c) e.g. a new Regulation XXX to cover „Dynamic control systems of low speed driverless vehicles“ (covering R13H, R79, etc. for vehicles with a max design speed < XX km/h)

TEMPLATE FOR REVIEW

UN Regulation No. XXX / GTR No. XX

UN Group: GRxx

Regulation applicable to Automated Vehicles/driverless vehicles: [] yes [] no

Potential approach for application:
no amendment required | amendment | new Regulation

Content Summary

Summary of required changes

Content relevant for FAV's / driverless vehicles

Specifics for vehicles can be driven manually and driverless:

Content to be transferred to ADS Regulation

EXAMPLE

UN Regulation No. 79

UN Group: GRVA

Regulation applicable to Automated Vehicles/driverless vehicles: [] yes [] no

Potential approach for application:
~~no amendment required~~ | amendment | new Regulation

Content Summary

- Ensure that all components of the steering system are designed properly to ensure high level of safety:
- No physical breakage of mechanical components (well dimensioned)
- Steering forces are at level which can be handled by the driver, even in case of failure
- Steering performance in nominal cases
- Steering performance in failure cases
- Warnings to be issued to warn the driver
- ADAS specific requirements

Summary of required changes

- Replacing the driver actuating the steering control with the steering demand generated by the ADS
- Testing section to be updated
- ...

Content relevant for FAV's / driverless vehicles

- System robustness (well dimensioned)
- Steering performance under nominal conditions
- Steering performance under failure conditions
- Steering performance in „maintenance mode“
- Warnings to be issued to warn the operator/control tower/occupants
- Performance considering max design speed of the vehicles

Specifics for vehicles can be driven manually and driverless:

- Consider that the steering demand can be requested by the actuation of manual controls (driver) or by generation of the ADS
- ...

Content to be transferred to ADS Regulation

- Generation of steering demand by the ADS
- HMI intended for communication with driver ?