Submitted by the TF on ADAS

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Proposal for a draft supplement to the original version of UN Regulation No. 171 (171-00) and its 01 series of amendments (171-01)

Note: The text is based on document ECE/TRANS/WP.29/2025/7 as amended by documents WP.29-195-05 and ECE/TRANS/WP.29/2025/144. The modifications to the text of the mentioned base documents are marked in bold for new characters and in bold strikethrough for deleted characters.

I. Proposal

Introduction, paragraph 17, amend to read:

"17. While DCAS is currently being diligently developed by many manufacturers and is supposed to be further developed in the future, this UN Regulation is established based on the current technology and data from **the** limited number of vehicles introduced to the market. This UN Regulation implements such an instrument as monitoring of DCAS operation intended for collecting more data from the vehicles with DCAS which will be introduced into the market. This UN Regulation is a subject to continuous review based on examining the technology development and the data obtained through the monitoring of DCAS operation."

Paragraph 2.11., amend to read:

"2.11. "*Target Lane*" means the lane of ~~the~~ travel to which the system intends to transition the vehicle by performing a manoeuvre."

Paragraph 5.3.5.1., amend to read:

"5.3.5.1. The system shall aim to detect the applicable system boundaries when DCAS or a feature of DCAS is in 'on' mode. If the system identifies that the system or feature boundary is exceeded, ~~it~~ **the system or the applicable feature** shall **leave the 'active' mode**~~transition into 'stand-by' mode~~**, with the exception of the driver unavailability response,** and immediately notify the driver in accordance to the strategies described by the manufacturer as outlined in paragraph 5.3.5.2. and according to the HMI requirements defined in paragraph 5.5.4.1.

The system shall terminate assistance to the driver provided by the affected feature or the system in a controllable way. The assistance termination strategy shall be described by the vehicle manufacturer and assessed according to Annex 3."

Paragraph 5.3.7.1.4., amend to read:

"5.3.7.1.4. When the system reaches its boundary conditions set out in paragraph 9.1.3., and both in the absence of any driver input to the steering control and when any ~~the~~ front tyre of the vehicle starts to unintentionally cross a lane marking, the system shall avoid sudden loss of steering support by providing continued assistance to the extent possible as outlined in the safety concept of the vehicle manufacturer. The system shall clearly inform the driver about this system

status by means of an optical warning signal and additionally by an acoustic or haptic warning signal.

For vehicles of categories M_2 M_3 N_2 and N_3, the warning requirement above is deemed to be fulfilled if the vehicle is equipped with a Lane Departure Warning System (LDWS) fulfilling the technical requirements of UN Regulation No. 130."

Paragraph 5.3.7.2.1.1., amend to read:

"5.3.7.2.1.1. A manoeuvre shall only be initiated if the driver is not ~~detected~~ **deemed** to be disengaged **(as specified in 5.5.4.2.4. and 5.5.4.2.5.) for more than 2 s immediately prior to its start**, and

(a) has commanded the system to perform the manoeuvre for a driver-initiated manoeuvre; or
(b) has acknowledged the system's intention as needed for a driver-confirmed manoeuvre; or
(c) is given sufficient notice to react for a system-initiated manoeuvre.

Motoric disengagement may not be considered when HORs are being withheld by the system."

Insert new paragraph 5.3.7.2.1.13., to read:

"5.3.7.2.1.13. The manufacturer shall describe in the safety concept the system behaviour in case the driver is detected to be disengaged during a manoeuvre (e.g., aborting the manoeuvre, fully executing a manoeuvre, bringing the vehicle to a safe stop)."

Paragraph 5.3.7.2.3.1., amend to read:

"5.3.7.2.3.1. The ~~requirements outlined in paragraph 5.5.4.1.8. and subparagraphs shall apply. In addition, the~~ system shall be designed to ensure that the driver has sufficient time to confirm that the system may proceed with the manoeuvre, as appropriate."

Paragraph 5.3.7.2.4.3., amend to read:

"5.3.7.2.4.3. **Reserved"** ~~The manufacturer shall also describe in the safety concept the system behaviour in case the driver is detected to be disengaged during a manoeuvre (e.g., initiation of a risk mitigation function, full execution of the manoeuvre, stop the vehicle).~~

Paragraph 5.3.7.3.1., amend to read:

"5.3.7.3.1. The system**'s driver unavailability response** shall comply with the technical requirements and transitional provisions of the 04 or later series of amendments to UN Regulation No. 79 with respect to the Risk Mitigation Function (RMF). In the event that the driver has been determined to be unavailable following a driver disengagement warning escalation sequence as defined in paragraph 5.5.4.2.6., the system shall ~~appropriately activate the Risk Mitigation Function in order to~~ come to a safe stop **in accordance with the RMF requirements."**

Paragraph 5.3.7.3.3., amend to read:

"5.3.7.3.3. Where the system is equipped with a driver-confirmed or system-initiated lane change feature, the ~~RMF~~**system** shall be capable of performing lane changes **during the driver unavailability response**, in compliance with the technical requirements for ~~systems~~ **RMF**~~with the purpose~~ **capable** of bringing the vehicle to a safe stop outside its own lane of travel of the 04 or later series of amendments to UN Regulation No. 79, during an intervention on a highway to bring the vehicle towards a target stop area in a slower or emergency lane."

Paragraphs 5.5.4.2.5.2. and 5.5.4.2.5.2.1., amend to read:

"5.5.4.2.5.2. The driver shall be deemed to be visually disengaged when the driver's eye gaze and/or head posture, as relevant, is directed away from any currently driving task relevant area.

An outline of the driving task relevant areas, and when they are relevant, shall be specified by the manufacturer in the documentation provided to the Type Approval Authority. For the purpose of the assessment of visual disengagement, the dashboard and instrument panel ~~shall not~~ **may** be considered as a driving task relevant area **only while manoeuvre relevant information (as detailed in paragraph 5.5.4.1.8.1.) is displayed for a maximum duration of 3 seconds.**

The EOR warning time shall not be extended with the time the drivers gaze is directed towards the dashboard or instrument panel."

"5.5.4.2.5.2.1. The driver shall be deemed to be visually ~~engaged or~~ reengaged following an aversion of eye gaze or head posture**,** if either are re-directed towards any currently driving task relevant area **with the exception of the dashboard and the instrument panel** for a sufficient duration depending on the situation. The duration shall be at least 200 milliseconds."

Paragraphs 5.5.4.2.7. and 5.5.4.2.7.1., amend to read:

"5.5.4.2.7. Additional Strategies for Disengagement Detection and Re-Engagement Support

~~The driver state monitoring system shall be equipped with strategies to assess whether the driver is disengaged in the event that no driver input has been determined over prolonged periods (e.g. through a negative determination of driver drowsiness), and implement appropriate countermeasures.~~

5.5.4.2.7.1. The driver state monitoring system shall have strategies to assess whether the driver is disengaged in the event that no driver input has been determined over prolonged periods (e.g. through a negative determination of driver drowsiness or assessment of changes in gaze direction), and implement appropriate countermeasures."

Paragraph 6.2.4.1., amend to read:

"6.2.4.1. When there is an approaching vehicle.

The system shall be designed to not make an approaching vehicle decelerate at a higher level than 3.0 m/s^2 in order to ensure that the distance between the two vehicles is never less than that which the DCAS vehicle travels in 1 second.

This assessment shall be performed with the assumptions that the approaching vehicle begins its deceleration:

(a) 1.4 seconds after the system starts the lateral movement of the lane change procedure; and

(b) Either:

(i) 0.4 seconds after the system starts the lane change manoeuvre, provided that the approaching vehicle was detected by the DCAS vehicle for a duration of at least 1.0 seconds immediately before the lane change manoeuvre starts; or

(ii) 1.4 seconds after the system starts the lane change manoeuvre.

At speeds up to 60 km/h the system may deviate from this assessment. In these cases, the manufacturer shall explain the distances and timings for an approaching vehicle under which a lane change manoeuvre can be started to the Type Approval Authority, and provide evidence of those situations being deemed controllable for other road users."

Annex 3

Paragraphs 2.15. and 2.16., delete:

~~"2.15. "*Highway*" means a **type of** road where pedestrians and cyclists are prohibited and which, by design, is equipped with a physical separation that divides the traffic moving in opposite directions.~~

~~2.16. "*Non-Highway*" means a **type of** road other than a highway as defined in paragraph 2.15."~~

Paragraph 3.5.7., renumber to 3.4.5. and place after paragraph 3.5.4.:

"3.4.5. The documentation shall outline a system information strategy which aims to encourage the driver to review information on system operation when the driver operates the system (e.g. a regular notification at the start of the drive cycle when the system is switched to 'on' mode proposing the driver to review relevant materials)."

Insert new paragraph 3.5.5., to read:

"3.5.5. The manufacturer shall establish processes to manage safety during the operation phase of the product lifecycle, including carrying out monitoring of DCAS operation and taking remedial actions when necessary."

Paragraph 3.5.5. (former), renumber to 3.5.6. and amend to read:

"3.5.~~5.~~**6.** The manufacturer shall demonstrate that periodic independent internal process audits are carried out to ensure that the processes established in accordance with paragraphs 3.5.1 to 3.5.~~4.~~**5.** are implemented consistently."

Paragraph 3.5.6. (former), renumber to 3.5.7.

Annex 3 - Appendix 2

Insert new subparagraphs 1.1. and 1.1.1., to read:

"1.1. Definitions

For the propose of this appendix,

1.1.1. *"Evidence"* means material pertinent to demonstrating the validity of a claim such as physical test results, simulation results, analyses with supporting data, etc."

Annex 4

Introduction, amend to read:

"1. Introduction

This Annex defines physical tests with the purpose to verify the technical requirements applicable to the system and the declaration made by the manufacturer according to Appendix 4 to Annex 3. All **of** the **relevant base** tests in this annex shall be performed or witnessed by the Type Approval Authority or the Technical Service acting on its behalf (hereafter referred as "Type Approval Authority") during the approval process.

At least one extended test associated with each applicable base test shall be performed or witnessed during the approval process. Further extended tests shall be performed or witnessed during the approval process at the request of the Type Approval Authority. For those extended tests that are not performed during the approval process, the manufacturer shall provide evidence of the required system behaviour in those scenarios.

[During the assessment according to Annex 3, the Type Approval Authority or the Technical Service acting on its behalf may identify scenarios of particular relevance

with regards to safety risk. Given that sufficient base and extended test performance can be ensured by alternative evidence, the identified scenario with particular safety relevance may replace a base or extended test scenario.]

The specific test parameters for track tests shall be selected by the Type Approval Authority based on the declaration made by the manufacturer and shall be recorded in the test report in such a manner that allows traceability and repeatability of the test setup.

Pass- and Fail-Criteria for tests are derived solely from the technical requirements in paragraphs 5. and 6. of this UN Regulation and correspondence with the declarations made according to Appendix 4 to Annex 3.

The tests specified in this document shall be intended as a minimum set of tests. The Type Approval Authority may perform additional tests and compare the measured results against the requirements in paragraphs 5. and 6., or the contents of the Audit according to Annex 3."

Insert new paragraph 4.2.2.2., to read:

"4.2.2.2. For systems where identical initial conditions (e.g., path or positioning) of the vehicle in a given scenario may not always result in a repeatable outcome (e.g. using non-rule-based algorithms), the manufacturer shall explain this deviation to and agree with the Type Approval Authority on the ranges of different test parameterization that do not modify the objective of the test scenario and diverge from other requirements of this regulation."

II. Justification

Amendments to Introduction and paragraph 2.11.

Amendments to the introduction and paragraph 2.11. are grammatical corrections.

Amendments to 5. General Specifications

Paragraph 5.3.5.1. is amended to clarify system behaviour when leaving system boundaries.

Paragraph 5.3.7.1.4. is a grammatical correction.

Paragraph 5.3.7.2.1.1. is amended to clarify disengagement requirements prior to a manoeuvre being initiated.

Paragraph 5.3.7.2.1.13. is former paragraph 5.3.7.2.4.3. moved to more appropriate position.

Paragraph 5.3.7.2.3.1. is amended to eliminate redundancy.

Paragraph 5.3.7.2.4.3. was deleted as its content was moved to paragraph 5.3.7.2.1.13.

Paragraphs 5.3.7.3.1. and 5.3.7.3.3. are amended to clarify the terminology for the system's driver unavailability response and references to the Risk Mitigation Function (RMF).

Paragraphs 5.5.4.2.5.2. and 5.5.4.2.5.2.1. are amended with additional clarifications.

Paragraphs 5.5.4.2.7. and 5.5.4.2.7.1. are amended as a structural change with an additional example provided.

Amendments to 6. Additional Specifications for DCAS features

Paragraph 6.2.4.1. is amended to allow for alternative strategies to be used for lower speed lane changes.

Amendments to Annex 3

Paragraphs 2.15. and 2.16. are deleted due to duplication.

Paragraph 3.4.5. was previously 3.5.7. and was moved to section 3.4.

Paragraph 3.5.5. is added to clarify the necessity of establishment of processes to manage safety during the operation phase of the vehicle lifecycle.

Paragraph 3.5.6. (former 3.5.5.) was amended to correct a reference.

Amendments to Annex 3 Appendix 2

New subparagraphs 1.1. and 1.1.1. are added to define the term ‘Evidence’ in alignment with the definition used by the IWG ADS.

Amendments to Annex 4

Introduction is amended to clarify which base/extended tests are required to be conducted and which can be further requested by the Type Approval Authority.

Paragraph 4.2.2.2. is inserted to take into account challenges with track testing complex systems.