

**Economic and Social Council**Distr.: General
20 November 2020

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations**Working Party on Automated/Autonomous and Connected Vehicles****Ninth session**

Item 6 (a) of the provisional agenda

UN Regulation No. 79 (Steering equipment):**Automatically Commanded Steering Function****Proposal for a Supplement to the 03 series of amendments to
UN Regulation No. 79 (Steering equipment)****Submitted by the expert from European Association for
Electromobility ***

The text below was prepared by the expert from the European Association for Electromobility (AVERE). It is based on ECE/TRANS/WP.29/GRVA/2020/7 and incorporates feedback received during the previous sessions of the Working Party on Automated/Autonomous and Connected Vehicles (GRVA). The modifications of the existing Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2021 as outlined in proposed programme budget for 2021 (A/75/6 (Sect.20), para 20.51), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. Proposal

Paragraph 5.6.2.1.3., amend to read (insert a new provision (d)):

5.6.2.1.3. The system shall be designed so that excessive intervention of steering control is suppressed to ensure the steering operability by the driver and to avoid unexpected vehicle behaviour, during its operation. To ensure this, the following requirements shall be fulfilled:

- (a) The steering control effort necessary to override the directional control provided by the system shall not exceed 50 N;
- (b) The specified maximum lateral acceleration $a_{y_{\max}}$ shall be within the limits as defined in the following table:

Table 1
For vehicles of Category M₁, N₁

Speed range	10 - 60 km/h	> 60 - 100 km/h	> 100 - 130 km/h	> 130 km/h
Maximum value for the specified maximum lateral acceleration	3 m/s ²	3 m/s ²	3 m/s ²	3 m/s ²
Minimum value for the specified maximum lateral acceleration	0 m/s ²	0.5 m/s ²	0.8 m/s ²	0.3 m/s ²

For vehicles of Category M₂, M₃, N₂, N₃

Speed range	10 - 30 km/h	> 30 - 60 km/h	> 60 km/h
Maximum value for the specified maximum lateral acceleration	2.5 m/s ²	2.5 m/s ²	2.5 m/s ²
Minimum value for the specified maximum lateral acceleration	0 m/s ²	0.3 m/s ²	0.5 m/s ²

- (c) The moving average over half a second of the lateral jerk generated by the system shall not exceed 5 m/s³.
- (d) **Special provision for vehicles of Category M₁**

It is recognised that the function may be used in high-curvature environments (S-bends, cloverleaves, bends on rural roads, etc.) where the driver expects continued lane-keeping support at road-legal speeds. The manufacturer may declare control strategies (e.g. transient behaviour) for when the system would encounter lateral acceleration values exceeding the limits described in the table above due to changes in the radius of curvature of the bend.

In such an event, for vehicle speeds up to 80 kph, the system may exceed the $a_{y_{\max}}$ limit of 3 m/s² for up to 2 seconds of time by not more than 40% in order to safely return to the maximum value defined in the table above.

This special provision shall be subject to Annex 6 and the manufacturer shall demonstrate, to the satisfaction of the Technical Service, the safety aspects of this special provision.

II. Justification

1. This document is based on ECE/TRANS/WP.29/GRVA/2020/7, incorporating further feedback received.
 2. The reference document ECE/TRANS/WP29/1140 containing “Definitions on Automated Driving under WP.29 and the General Principles for developing a UN Regulation on automated vehicles”, adopted by WP.29 in March 2018 in the 174th session, recognizes the use of Automatically Commanded Steering Function (ACSF) of Category B1 in urban and interurban roads.
 3. The ACSF of Category B1 provisions in the Regulation require further review in view of the radically different environments where the function may be expected to provide assistance to the driver. The proposal aims to attempt a first step in this direction by ensuring continued, expected and safe performance in environments that are challenging under the current B1 provisions but can otherwise be safely handled by lane-keeping support systems elsewhere in the world. These systems show good and safe performance.
 4. This proposal intends to allow the system to have a grace time in order to deal with unexpected changes in the radius of the curvature of the bend, by allowing the system to exceed the imposed $a_{y_{\text{max}}}$ limit of 3 m/s^2 by a maximum of 40 per cent for up to two seconds. This will allow the system to offer consistent mitigation and slow down to return to the limits described in the table in a safe manner, avoiding unexpected and confusing behaviour for the driver and rear traffic.
 5. The proposal also aims to improve the usability of the assisted or automated driving function, because the vehicle occupants would not feel discomfort due to an apparent drop in vehicle speed associated with a limited level of lateral acceleration under the current version of the Regulation. The proposal also aims to reduce driver and rear traffic confusion due to an apparent drop in vehicle speed.
-