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## Economic Commission for Europe

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**Convention on Road Traffic (1968):**

**Automated driving**

**Vehicles with automated driving systems**

**The concept of activities other than driving**

### **Revised safety considerations for activities other than driving undertaken by the driver in a vehicle when its automated driving system is engaged**

**Submitted by Canada, France, Germany, Japan, Luxemburg, the Netherlands, Sweden and the United Kingdom**

This document proposes a draft text for a resolution on “activities other than driving” that the driver of a vehicle equipped with an automated driving system may be permitted domestically to undertake when the automated driving system is engaged.

## **Global Forum for Road Traffic Safety (WP.1) resolution on safety considerations for activities other than driving undertaken by the driver in a vehicle when its automated driving system is engaged**

1. The automated driving systems (ADS) in scope of this Resolution are those which issue transition demands to the driver. Drivers using such automated driving systems need to be ready and able to exercise dynamic control, and may be expected to do so on a transition demand. This resolution does not apply to advanced driver assistance systems (ADAS) where the driver has to monitor the driving environment continuously and intervene immediately whenever necessary (as with manual driving). Furthermore, it does not apply to automated driving systems that do not require the driver to take dynamic control, as these automated driving systems do not issue transition demands.

### **I. Background**

2. The Global Forum for Road Traffic Safety (WP.1) of the United Nations Economic Commission for Europe has prepared and adopted this Resolution based on the following provisions:

- (a) 1968 Convention on Road Traffic in regard to the duty to ‘minimise any activity other than driving’ (Article 8(6)), and
- (b) 1949 Convention on Road Traffic, in regard to the duties to:
  - (i) ‘conduct himself in such a way as not to endanger or obstruct traffic’ (Article 7),
  - (ii) ‘avoid all behaviour that might cause damage to persons, or public or private property’ (Article 7), and
  - (iii) ‘drive in a reasonable and prudent manner’ (Article 10).

Article 8(6) of the 1968 Convention on Road Traffic provides:

A driver of a vehicle shall at all times minimize any activity other than driving. Domestic legislation should lay down rules on the use of phones by drivers of vehicles. In any case, legislation shall prohibit the use by a driver of a motor vehicle or moped of a hand-held phone while the vehicle is in motion.

Article 7 of the 1949 Convention on Road Traffic provides:

Every driver, pedestrian or other road user shall conduct himself in such a way as not to endanger or obstruct traffic; he shall avoid all behaviour that might cause damage to persons, or public or private property.

Article 10 of the 1949 Convention on Road Traffic provides:

The driver of a vehicle shall at all times have its speed under control and shall drive in a reasonable and prudent manner. He shall slow down or stop whenever circumstances so require, and particularly when visibility is not good.

### **II. Preamble**

3. The Global Forum for Road Traffic Safety (WP.1) of the United Nations Economic Commission for Europe,

4. Considering that road traffic safety and traffic flow will be increasingly defined and influenced by the combination of and interaction between automated driving system capabilities, human behaviour and infrastructure requirements;

5. Noting that automated driving systems may in some circumstances demand that the driver take dynamic control, and that it may be necessary for the driver to both be ready and able to take dynamic control of the vehicle and to do so;

6. Noting that, in its seventy-fifth session, WP.1 confirmed that the following principles will be applied by the Contracting Parties to the 1968 Convention on Road Traffic as well as followed by those applying the 1949 Convention on Road Traffic's equivalent requirements in Articles 7 and 10:

“When the vehicle is driven by vehicle systems that do not require the driver to perform the driving task, the driver can engage in activities other than driving as long as:

(a) these activities do not prevent the driver from responding to demands from the vehicle systems for taking over the driving task, and

(b) these activities are consistent with the prescribed use of the vehicle systems and their defined functions”;

7. Noting the need to take account of relevant scientific evidence or lack thereof, when regulating and introducing new road technologies in order to protect road safety, especially where there are threats of fatalities or serious injuries;

8. Noting the necessity of close cooperation between the Global Forum for Road Traffic Safety (WP.1) and World Forum for Harmonization of Vehicle Regulations (WP.29) to ensure that guidance pertaining to the conduct of other activities continues to evolve based on scientific evidence and data, the evolution of automated driving system technologies and the development of WP.29 safety requirements; and

9. Without prejudice to exploring further human roles when an automated driving system is engaged;

has prepared and adopted this Resolution on [DATE].

### **III. Purpose of this Resolution**

10. This Resolution aims at providing a framework for Contracting Parties to the 1968 and 1949 Conventions on Road Traffic, relating to drivers undertaking activities other than those related to exercising dynamic control of the vehicle. This is intended to help these parties in establishing domestic traffic laws for performing other activities while automated driving systems are engaged.

### **IV. Recommended application of this Resolution: assumptions**

11. This Resolution acknowledges that the enhancement of road safety will be informed by the ongoing development of technical requirements and/or validation methods to confirm the safety of automated driving systems and to confirm the ability of such systems to support a driver to safely undertake activities other than driving.

12. Recognizing this, it is assumed that automated driving systems will support the following outcomes:

(a) Safe interaction between the driver and the automated driving system through an effective and intuitive human-machine interface;

(b) Automated driving system responsibility for the safe execution of dynamic control, when the automated driving system is performing the driving task;

(c) A safe, predictable transition phase, which includes sufficient lead time for the driver to complete a safe process to take dynamic control;

(d) The ability to determine that the driver is ready and able to respond to a transition demand from the automated driving system, and to react appropriately depending on whether the driver intentionally takes dynamic control;

(e) The performance of emergency manoeuvres, as drivers cannot be expected to take dynamic control in situations that are safety- and time-critical; and

(f) The performance of appropriate risk mitigation manoeuvres (including where the automated driving system takes action if the driver disregards a transition demand or if it is determined that the driver is not ready and able to respond to a transition demand from the automated driving system).

13. Based on the assumptions listed above, WP.1 has established four criteria for drivers to undertake activities which are unrelated to exercising dynamic control of the vehicle. These criteria are outlined in the following framework and should be considered in conjunction with automated driving system safety requirements developed by WP.29:

## **V. Recommended framework comprising four criteria for drivers to engage in activities other than driving**

14. Based on the assumptions listed above, a driver using a vehicle in which an automated driving system is engaged may undertake activities other than driving provided all four of the following criteria are met:

(a) These activities do not prevent the driver from responding to demands from the automated driving system for taking dynamic control;

(b) These activities are consistent with the prescribed use of the automated driving system and its defined functions;

(c) The driver complies with traffic laws applicable in the country regarding activities other than driving; and

(d) The driver has and maintains the capabilities necessary to fulfil their respective duties regardless of whether an automated driving system is engaged.

15. The above criteria are expanded and explained below.

### **Criterion a:**

16. Each time the automated driving system issues a clear transition demand, the driver is expected to take timely, safe and proper dynamic control of the vehicle.

17. Any activities other than driving undertaken by the driver should not compromise the ability and readiness of the driver to comply with an expectation to take dynamic control.

18. It is important to manage the driver's attention, so that they are alert enough to be ready and able to take dynamic control from the automated driving system. The automatic suspension of activities other than driving that rely on technologies integrated with, or connected to, the vehicle in case of a transition demand has been identified as one effective measure to offer activities other than driving in a safe way.

19. In all cases the driver must not interfere with any part of the automated driving system in a way that could compromise safety.

### **Criterion b:**

20. Criterion "a" should be considered by the manufacturer in the design of the system's human-machine interface (including the transition phase and the lead time provided for a safe transition).

21. Consideration should be given to how to determine driver availability to respond to a transition demand from the automated driving system. A means to confirm that the driver has intentionally taken dynamic control of the vehicle before the system is deactivated should also be considered.

22. Road safety and traffic flow should not be disrupted if the driver does not take safe and proper dynamic control in response to a transition demand.

23. The manufacturer of the automated driving system should provide the driver with clear explanations about the prescribed use of the vehicle system before the driver uses it, and consequently the driver must be aware of these explanations before using the system. This should include the implications for the driver's responsibilities and their expected behaviour in the case of a transition demand, according to applicable international and national law. In addition, the manufacturer should not use misleading names, descriptions and promotional material which could encourage improper use of the system.

24. The automated driving system should communicate clearly with its driver so that the driver can understand any instruction given by the system.

### **Criterion c:**

25. Contracting Parties to one or both Conventions are encouraged to consider measures to address the undertaking of activities other than driving as appropriate.

26. Prior to any on-road use, drivers should familiarize themselves with requirements regarding the undertaking of activities other than driving while the automated driving system is engaged. Drivers should comply with the requirements that apply in the country in which the automated driving system is used. Contracting Parties should consider enabling drivers to obtain the necessary competence to manage the demands of new technologies in vehicles through driver education and verifying this competence in a driver test or by further training. The driver must also hold the necessary driving permit corresponding to the vehicle category.

### **Criterion d:**

27. The driver of a vehicle equipped with an automated driving system must have and maintain the necessary physical and mental capabilities and sufficient skills to drive that vehicle regardless of whether the automated driving system is engaged.

28. Drivers should consider their individual capabilities to resume driving when deciding whether to engage in activities other than driving when the automated driving system is engaged. A driver should not engage in an activity other than driving if the activity itself, the driver's individual circumstances, or other conditions could prevent the driver from safely responding to a transition demand in a timely manner.

29. Drivers should be informed and educated about the importance, for safety, of a timely response to transition demands and about the decisions, behaviours, and circumstances that may prevent such a response. Contracting parties and manufacturers of automated driving systems should consider their respective responsibilities to communicate this information to the driver.

## **VI. Conclusions about the recommended framework within which activities other than driving are permitted**

30. Provided that the assumptions and criteria set out above are met, a driver may then undertake activities other than driving.

31. As it is not feasible or adequate to provide a complete list of the acceptable activities other than driving, this Resolution defines four criteria to which these activities should conform. Further research on how to manage the driver's attention so as to support road safety and safe traffic flow is needed as these technologies develop.

## VII. Terminology

32. “Automated driving system” or “ADS” refers to a vehicle system that uses both hardware and software to exercise dynamic control of a vehicle on a sustained basis.

33. “Dynamic control” refers to carrying out all the real-time operational and tactical functions required to move the vehicle. This includes controlling the vehicle’s lateral and longitudinal motion, monitoring the road, responding to events in the road traffic environment, and planning and signalling for manoeuvres.”

34 “Advanced driver assistance systems” or “ADAS” refers to systems, for example Lane Keeping Assist Systems, Adaptive Cruise Control, and Active Park Assist, that merely support the driver in exercising dynamic control. Therefore, activities other than driving in the context of manual and/or assisted driving are typically restricted to, for example, setting radio, navigation system, air conditioning, heating system, etc., in order to avoid driver distraction.

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