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Global Forum for Road Traffic Safety

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Convention on Road Traffic (1968):
Automated driving-Situations when a driver operates a vehicle from
the outside of the vehicle

Proposed Draft Resolution on Remote Driving

Submitted by the United Kingdom of Great Britain and Northern Ireland*

The WP.1 Informal Group of Experts on Automated Driving (IGEAD) has long been discussing the use of remote driving, starting with remote control parking. In the 10th IGEAD meeting, the group advanced a discussion document which was presented to WP.1, but not discussed in any great detail. To facilitate progress, the UK felt that it may be helpful to prepare a draft resolution, so discussions can focus on what the contracting parties expect and want from remote driving, rather than on a generalised discussion document.

The text below is a proposal for discussion only and draws down from the discussion document on Drivers out of the Vehicle, as well as the work done on the draft 'Other Activities' resolution, and the Automated Vehicle resolution that was adopted by WP.1 in its seventy-seventh session of September 2018.

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* This document is not a statement of UK Government Policy

[Draft] Resolution on remote driving

I.   Preamble

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

(a)   Noting that the Convention on Road Traffic done at Geneva on 19 September 1949 and the Convention on Road Traffic done at Vienna on 8 November 1968 have had significant bearing on the definition of domestic road traffic legislation and regulation and have noticeably improved road safety;

(b)   Recognising the ongoing work on new automotive technologies in the World Forum for the Harmonisation of Vehicle Regulations (WP.29) of the United Nations Economic Commission for Europe, and its subgroups;

(c)   Noting that both Conventions require that every vehicle shall have a driver[1], and that the driver shall be able to control their vehicle[2];

(d)   Recalling that in its 75th session, WP.1 concluded that *"Remote Control Parking ... does not compromise road safety ..."[3]*;

(e)   Being cognizant that new remote driving systems are under development which may play a role in the safe deployment of automated driving systems, and helping to improve road safety and mobility;

has prepared and adopted this Resolution on [date?].

II.   Scope

2.   This Resolution

(a)   Is intended to guide Contracting Parties to the Convention on Road Traffic done at Geneva on 19 September 1949, and the Convention on Road Traffic done at Vienna on 8 November 1968, with respect to drivers safely exercising dynamic control while located outside the vehicle.

(b)   Provides a framework for Contracting Parties to those Conventions on Road Traffic when establishing domestic traffic laws for the use of vehicles equipped with remote driving systems.

(c)   Will evolve as technology develops and as experience and evidence accumulate regarding the use of remote driving systems. Therefore, the explicit inclusion of a recommendation in this Resolution should not be construed as the implicit exclusion of any other.

III.   Definitions

3.   For the purpose of this resolution:

(a)   "Automated driving system" refers to the combination of hardware and software that can exercise dynamic control of an automated vehicle on a sustained basis.

(b)   "Conditionally automated vehicle" refers to a vehicle equipped with an automated driving system. This automated driving system operates within a specific operational [domain/design domain] for some or all of the journey and needs human intervention as a fallback to ensure road safety.

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[1]   Article 8(1) of the 1949 Convention, and Article 8(1) of the 1968 Convention
[2]   Article 8(5) of the 1949 Convention, and Article 8(5) of the 1968 Convention
[3]   http://www.unece.org/fileadmin/DAM/trans/doc/2017/wp1/ECE-TRANS-WP1-159e_new.pdf

(c) "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 environment, responding to events in the road traffic environment, and planning and signalling for manoeuvres.

(d) "Highly automated vehicle" refers to a vehicle equipped with an automated driving system. This automated driving system operates within a specific operational [domain/design domain] for some or all of the journey, without the need for human intervention as a fallback to ensure road safety.

(e) "Operational [domain/design domain]" refers to the environmental, geographic, time-of-day, traffic, infrastructure, weather and other conditions under which an automated driving system is specifically designed to function.

(f) "Remote driver" refers to a driver who is located outside of the vehicle.

(g) "Remote driving systems" refers to the combination of hardware, software, and connectivity solution, both inside of and outside of the vehicle, that allow a remote driver to exercise dynamic control of a vehicle in a timely manner, and appropriate fields of vision to provide situational awareness and a clear view of the road traffic environment.

IV. Recommendations for remote driving systems

4. The remote driving system should:

(a) allow the remote driver to have an appropriate field of view, and to receive appropriate auditory information (recognising that auditory information may not be essential);

(b) allow the remote driver to give appropriate and timely input to the vehicle, and allow the vehicle to react to that input in an appropriate and timely manner;

(c) have redundancy in sensing and connectivity to minimise the risk of signal loss and/or degradation; and

(d) be secure by design, including consideration of operational resilience and response in the event of cyberattacks, to ensure that they are able to survive particular types of attack at fleet level, and prevent potential malicious use.

5. The remote driving system and vehicle should meet appropriate technical standards and should be tested against these.

6. A vehicle with a remote driving system should achieve a minimum risk condition if:

(a) the remote driver does not, or cannot, provide appropriate and timely input and the vehicle is unable to react in an appropriate and timely manner,

(b) The latency of the connection between the remote driver and vehicle has exceeded [safety tolerances], and/or

(c) The connection between the remote driver and the vehicle fails or is degraded beyond [safety tolerances].

V. Recommendations for remote drivers

7. The remote driver must have the physical and mental capabilities to exercise dynamic control if they are:

(a) in control of a non-automated vehicle or one with driver assistance systems,

(b) required to resume dynamic control of a conditionally automated vehicle as the safety fallback for the automated driving system, or

(c) expected to resume dynamic control of a highly automated vehicle if the journey continues beyond the parameters of the vehicle's operational [domain/design domain].

8.   The remote driver is required to hold the appropriate licences to use and operate the vehicle.

9.   The remote driver should be ready, able, and willing to exercise dynamic control, and should minimise any other activity that would restrict or impair their ability to resume dynamic control.

10.   The remote driver of a conditionally automated vehicle, or a highly automated vehicle, must be able to remotely activate and de-activate the automated driving system.

VI.   Conclusions

11.   A combination of the remote driver and vehicle that is able to safely exercise dynamic control as well as, or better than, a driver inside a vehicle, would be compatible with the road safety principles of the 1949 Convention and the 1968 Convention.

12.   Contracting parties are recommended to amend their domestic legislation, regulation, and guidance to support the safe use of remote driving systems.

13.   This Resolution will be kept up to date as understanding of remote driving systems and their use continues to grow.

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