



UNECE

Global Forum for Road Traffic Safety (WP.1)

Resolution on the Deployment of Highly and Fully Automated Vehicles in Road Traffic

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) Noting the continuous progress of automotive and digital technologies, which could improve road safety, including through the deployment of highly and fully automated vehicles in road traffic;
 - (c) Recognizing the potential for innovative safety technologies to improve social well-being by preventing motor vehicle accidents, both in ways that can now be foreseen and in ways that cannot yet be predicted, and desiring to avoid further obstacles that could impede the development of technologies that could offer significant benefits;
 - (d) Recognizing the potential for the mentioned technologies to support the United Nations Sustainable Development Goals by improving road traffic safety, inclusive mobility (including for those who cannot currently drive a motor vehicle), and by creating strategies where safe and efficient mobility is a tool for socio-economic growth and governance;
 - (e) Noting the need to provide guidance to support the safe, global deployment of highly and fully automated vehicles in road traffic;

has prepared and adopted this Resolution on 20 September 2018.

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 the safe deployment of highly and fully automated vehicles in road traffic, in order to support the enhancement of road traffic safety, mobility and socio-economic progress,
 - (b) Provides complementary recommendations supporting the road safety principles of the 1949 Convention on Road Traffic, and the 1968 Convention on Road Traffic, to facilitate the safe, global deployment of highly and fully automated vehicles in road traffic,
 - (c) Will evolve as technology develops and as experience and evidence accumulate regarding the use of highly and fully automated vehicles in road traffic. Therefore, the explicit inclusion of a recommendation in this Resolution should not be construed as the implicit exclusion of any other,
 - (d) Takes into consideration the role of human beings in the context of highly and fully automated vehicles,
 - (e) Offers recommendations at a global level to achieve a safe interaction between highly and fully automated vehicles and all road users,
 - (f) May, moreover, facilitate the development, under the guidance of the Global Forum for Road Traffic Safety (WP.1), of future measures related to the safe deployment of highly and fully automated vehicles in road traffic.

III. Definitions

3. For the purpose of this Resolution:

- (a) “Automated driving system” refers to a vehicle system that uses both hardware and software to exercise dynamic control of a vehicle on a sustained basis.
- (b) “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.
- (c) “Operational design domain” (ODD) 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.
- (d) “Highly automated vehicle” refers to a vehicle equipped with an automated driving system. This automated driving system operates within a specific operational design domain for some or all of the journey, without the need for human intervention as a fall-back to ensure road safety.
- (e) “Fully automated vehicle” refers to a vehicle equipped with an automated driving system. This automated driving system operates without any operational design domain limitations for some or all of the journey, without the need for human intervention as a fall-back to ensure road safety.

IV. Recommendations for automated driving systems in highly and fully automated vehicles

4. Automated driving systems in highly and fully automated vehicles should:

- ((a) Make road safety a priority;
- (b) Monitor and safely interact with the surrounding traffic environment;
- (c) Endeavour to safely tolerate errors of the vehicles’ users, inside and outside of the vehicle, and of other road users in order to minimize potential effects of such errors;
- (d) Comply with traffic rules, including those referring to:
 - (i) Interacting safely with other road users;
 - (ii) Following instructions from law enforcement authorities, and those authorized to direct traffic;
 - (iii) Maintaining smooth and safe flow of traffic.
- (e) Only operate within their ODD;
- (f) Be capable of achieving a state that maximizes road safety when a given trip cannot or should not be completed for example in case of a failure in the automated driving system or other vehicle system;
- (g) React to unforeseen situations in a way that minimizes danger to the vehicle’s users and other road users;
- (h) Communicate with their users and other road users, in a clear, effective and consistent way, by providing sufficient information about their status and intention, and enabling an appropriate interaction;
- (i) Clearly and effectively provide appropriate notice, if the vehicle leaves its ODD;
- (j) Operate in a way that enables verification as to whether or not they are or were performing dynamic control; and
- (k) Enable their deactivation in a safe manner.

V. Recommendations for users of automated driving systems in highly and fully automated vehicles

5. Users of automated driving systems in highly and fully automated vehicles should:
 - (a) Be aware and informed of their proper use prior to starting the journey;
 - (b) Meet the requirements for their safe use and follow the procedures for their use;
 - (c) Be able to communicate with the vehicle;
 - (d) Understand if, and when, it is necessary to exercise dynamic control to complete a journey. If the user is required to exercise dynamic control, or chooses to do so, they must:
 - (i) Hold the necessary driving permits; and
 - (ii) Comply with traffic rules.
 - (e) Act lawfully at all times so as not to compromise road safety regardless of whether they or automated driving systems are exercising the dynamic control.

VI. Further recommendations

6. Governments should consider:
 - (a) Promoting public awareness and understanding of the safe use of highly and fully automated vehicles to help secure the potential safety, mobility, and socioeconomic benefits;
 - (b) Adopting policies in accordance with their privacy regulations regarding the necessary data to assess:
 - (i) The safety impact of the use of highly and fully automated vehicles to support technological and regulatory advancement;
 - (ii) The causal factors involved in road traffic safety incidents, such as collisions, or traffic rule violations with highly and fully automated vehicles to resolve legal issues.
 - (c) Working on security measures including cybersecurity, to safeguard the proper functioning of automated driving systems in highly and fully automated vehicles; and
 - (d) Incorporating the recommendations in this Resolution into their domestic legal and policy frameworks for road traffic in a way that recognizes their national context, working with civil society and industry.

VII. Final provision

7. This Resolution will be periodically reviewed and updated to address technological and/or regulatory developments concerning highly and fully automated vehicles.