**Framework document**

**on in-service compliance assessment the vehicles including automated/autonomous vehicles and their components**

 ****1. Purpose****

1.1. This Framework document’s primary purpose is to provide a guidance for WP.29 and its subsidiary Working Parties by identifying the principles to facilitate and guide discussions and activities on **in-service performance** of the vehicles, equipment and parts including automated/autonomous vehicle.

 ****2. Working Principles****

2.1. The harmonization of technical provisions and/or guidance and resolutions for in-service performance of the vehicles including automated/ autonomous vehicle shall be conducted within the contexts of the 1958 Agreement, 1998 Agreement and 1997 Agreement.

2.2. The technical provisions and guidance resolutions for in-service performance of the vehicles will be performance based and technology neutral, based on the current state-of-the-art while avoiding restricting or limiting future innovation.

2.3. They shall take into account existing standards/guidelines of the contracting parties and in standardization bodies as well as previous work and reference documents agreed in UNECE.

2.4. Implementation of the technical provisions through the identified work priorities at the level of IWG on PTI and other GRs will aim at developing detailed technical requirements which may take the form of regulatory or non-regulatory instruments (e.g. guidelines, recommendations, UN Regulations, UN Global Technical regulations, UN Rules) as agreed and accepted by the contracting parties.

2.5. This document shall be approved and managed by WP.29 as specific work items are expected to be prepared in multiple GRs with extensive cross-coordination between them.

**3. Definitions**

For the purposes of this Framework document, unless specified otherwise therein:

*«Alternative requirements»* means administrative provisions and technical requirements that aim to ensure a level of functional safety, environmental protection and occupational safety that to the greatest extent practicable is equivalent to the level provided for by one or more of the UN Regulations.

*«Сompliance»* - meeting all the vehicle’s compliance requirements.

*«Compliance requirement» -*requirement that an vehicle has to comply with

*«Compliance risk»* -effect of uncertainty on compliance *objectives.*

Compliance risk can be characterized by the likelihood of occurrence and the consequences of *noncompliance* with the *compliance requirements.*

*«Entry into service»* means the first use, for its intended purpose, in the territory of the Contacting Party, of a vehicle, system, component, separate technical unit, part or equipment.

*«Equipment»* means goods other than parts that can be added to or installed on a vehicle.

*«Market surveillance»* means the activities carried out and measures taken by public authorities to ensure that products comply with the requirements set out in the relevant legislation and do not endanger health, safety or any other aspect of public interest protection.

*«Monitoring» -*determining the status of a vehicle or its component. To determine the status there may be a need to check, supervise or critically observe.

Monitoring is not a once-only activity, but a process of regularly or continuously observing a situation.

*«Noncompliance» -*non-fulfilment of a *compliance* requirements.

*«Objective»* -result to be achieved.

*«Parts»* means goods used for the assembly, repair and maintenance of a vehicle, as well as spare parts.

*«Performance»* -measurable result. Performance can relate either to quantitative or qualitative findings.

*«Performance* *monitoring»* " means malfunction monitoring, that consists of functionality checks and the monitoring of parameters that are not directly correlated to regulated thresholds, and that is done on components or systems to verify that they are operating within the proper range.

*«Risk»* -effect of uncertainty on *objectives.* An effect is a deviation from the expected.Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood.

*«Vehicle on-board diagnostic (OBD) information»* means the information generated by a system that is on board a vehicle or that is connected to an engine, and that is capable of detecting a malfunction, and, where applicable, is capable of signalling its occurrence by means of an alert system, is capable of identifying the likely area of malfunction by means of information stored in a computer memory, and is capable of communicating that information off-board.

*«Useful life»* means the relevant period of distance and/or time over which compliance with the relevant vehicle performance limits has to be assured;

**4. In-service compliance assessment principles**

4.1. The following list of topics are intended to guide discussions and activities on in-service compliance assessment within WP.29 and each of its relevant subsidiary Working Parties. The aim is to capture the shared interests and concerns of regulatory authorities, provide the general parameters for the work, and to assist with common definitions and guidance within WP.29 and for interested stakeholders.

4.2. This document seeks to create the framework to helping to deliver safe and secure road vehicles, and to promote collaboration and communication amongst those involved in their development and oversight.

4.3. The following is a list of common in-service compliance assessment principles. It is expected these would form the basis for further development within the GRs.

(a) all aspects of vehicle use need to be considered, including safety, the environment, mobility, efficiency, productivity and personal security;

(b) the vehicles of increased complexity need to be properly maintained and inspected throughout their life to ensure the continuous compliance;

(c) the opportunities afforded by advanced on-board and off-board measurement systems and other advances in vehicle technology are to be considered to reduce the cost of compliance;

(d) the increased public expectations for safety and reliability of the vehicles including automated/autonomous vehiclesand their components;

(e) the data collected in the processes of CoP and in-service conformity in frame of the 1958 Agreement, market surveillance, PTI/roadside inspections in frame of the 1997 Agreement can be used by the Contracting parties for proper safety management and ensuring the continuous compliance of the vehicle;

(f) the international vehicle safety legal acts shall be interconnected to ensure continuous compliance of the vehicle;

(g) when necessary, relevant requirements for the performance of systems and components including automated (autonomous) driving systems for in service compliance and assessment methods should be developed;

(h) access, under well-defined and agreed pre-conditions, to the technical specifications of each individual vehicle and the data needed for objective verification of the functionality of the safety and environment related systems, whether or not the systems are functioning should be ensured;

**5. Safety Vision**

5.1. Vehicles degrade over the time and it is necessary to assess the impact of degradations, breakdowns, tampering, wear and other events that may impact in vehicle’s performance in road safety and environmental protection. The Type Approval requirements, defined in UN Regulations, aim to last in a reasonable manner as long as the vehicle is used. Nevertheless, it is not considered that in service compliance means keeping the features of vehicles and their equipment and systems as new (approved) ones until scrapped. Nor does it deem that compliance with the requirements should be demonstrated with the same procedure as Type Approval. It is supported by the fact that vehicles are operated in wider range of driving conditions, than those tested. The requirements for the performance of systems and components including automated (autonomous) driving systems for in service compliance and in service compliance vehicle assessment methods shall be set assessing additional inputs, as described below.

5.2. The vehicles in-use in normal operational conditions shall not cause any traffic accidents resulting in injury or death that are reasonably foreseeable and preventable.

**6. In-service compliance assessment approach**

6.1. The in-service compliance assessment principles require the need to complement framework for type-approval with an effective market surveillance mechanism ensuring the robust verification of compliance of the automotive products.

It is essential for the proper functioning of market surveillance that the compliance of vehicles and their components on the market is verified on the basis of a robust risk-assessment. That verification of compliance, complemented by the establishment of a minimum number of checks on vehicles per year, would also contribute to the effective implementation of the market surveillance obligations.

6.2. A risk-analysis approach, which has to be developed for each system of the vehicle, consists of assessing the possibilities of noncompliance and their impacts. In essence, the fig. 1 shows the rationale.



Fig. 1

 6.3. Once followed the path described, a better rationale will be available to consider if:

 (a) Is it reasonable to check that system/performance during the life of the vehicle?

 (b) If the answer is yes:

 - what are the requirements for in service compliance verification of the performance of equipment and systems in the driving conditions other than those tested during the Type Approval?

* what are the methods for assessment of the requirements?

 (c) Would be convenient to foresee any kind of provision during the Type Approval?

 (d) Would be convenient to provide the data needed for objective verification of the functionality of the safety and environment related systems?

6.4. The Contracting Parties may apply administrative provisions and technical requirements that aim to ensure a level of functional safety, environmental protection and occupational safety that to the greatest extent practicable is equivalent to the level provided for by one or more of the UN Regulations.

 6.5. A vehicle may be maintained in service only if its respective performance is at least equal of the performance prescribed for a new vehicle in UN Regulations or alternative requirements.

 The performance may be verified by methods different from those prescribed in the relevant UN Regulations.