Issues related to Automated Driving Technology and Possible Guidance to GRRF

1. Background

- Vehicle manufacturers are individually developing technologies related to the automated driving system such as automated lane change system, integrated and advanced lane change support system, dead-man system, etc. These technologies are moving closer to practical use.

- These technologies are expected to contribute to road traffic safety if they are introduced properly. The deployment of such technologies in appropriate manner, therefore, should be promoted.

- Currently, the Automatically Commanded Steering Function, defined in Regulation 79, is restricted to operate only under 10km/h.

- It is reasonable to discuss whether R79 should be amended to permit the approval of technologies that provide dynamic control at higher speeds than currently permitted and, if so what provisions may be required to ensure their safe application.

2. TOR of Informal Group on ITS / Automated Driving (IG-AD)

- The TOR of IG-AD indicate that the IG-AD will discuss practical applications of the Automated Driving technologies (ADT) which are in line with the current Vienna and Geneva Conventions. The outcome of the discussion will be submitted to WP29 (refer to TOR 5). Meanwhile, discussions on Autonomous Driving Technologies will remain as an exchange of views (refer to TOR 6).

- Therefore, in parallel with discussions in the IG-AD on the definition of Automated Driving Technology from the legal point of view, practical applications of the Automatically Commanded Steering Function on the basis of TOR 5 and consequent possible amendments of R79 could be discussed in GRRF.

Categories of Automated Driving in TOR	**Related laws and Regulations**	**Schedule**
Automated Driving technologies (Advanced Drivers Assistance System only)	Automatically Commanded Steering Function(R79)	From January, 2015 till November, 2015
Autonomous Driving technologies (including some Automated Driving technologies)	-	From January, 2015

3. Possible discussion items on Automated Driving Technologies

3-1. Concept of “designed to assist drivers”

While discussion in the relevant GRs on driver assistance technologies would be limited to technologies ”designed to assist drivers” on the basis of Vienna and Geneva Conventions, it would be necessary first for the IG-AD to agree the distinction between “assistance/autonomy” and “autonomous” in order to help identify what technologies should be regarded as complying with the Conventions. However, since it would be clear that at least certain automated driving technology systems would be within the scope of the both conventions, guidance by WP29 to start the discussion on such technologies with the assumptions could be made to the relevant GRs.

Automated driving technology which executes a portion of the dynamic driving task shall be designed so that:

- They deactivate immediately with request for immediate control by the driver.
- the driver’s intention at any time shall be reliably reflected and the driver shall always provide a positive input to instigate the function of an automation system, except for systems that automatically intervene in an emergency,
- the driver always monitors the controls of driving or system operation,
- the driver takes over immediately if necessary, and
- the driver constantly supervises dynamic driving task executed by a partial automation system.

The narrative definitions below have been taken from the SAE and can be used as a starting point to understand the level of assistance/automation:

Level 1 DRIVER ASSISTANCE
The driving mode-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task

Level 2 PARTIAL AUTOMATION
The driving mode-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task

The IG-AD should consider developing clarifications of these levels (and further levels if necessary) to provide comprehension of “assistance” versus “autonomy” in the context of international regulation.

3-2. Others

Discussion concerning electronic security, cybersecurity, roadworthiness inspection provisions (OBD), EDR, etc. could also be made in the IG-AD but should not preclude consideration by the appropriate GRs.

4. Guidance to GRRF (provisional draft)

- **Scope of considerations**

Technological requirements for Automatically Commanded Steering Function related to technologies" designed to assist drivers" should be considered based on the points of sections 1, 2 and 3 above.

- **Targeted systems**

Targeted systems would be:

Driver assistance systems functioning in normal condition where a driver can always override its control. (Example: following steering operations)

- lane keeping operation "designed to assist drivers"

Automation systems functioning under the specific command of the driver

- lane changing operation "designed to assist drivers" in a restricted area which has multilane road sections with constructional separation of the two directions of traffic and no mixed traffic with pedestrians, cyclists and oncoming vehicles

- **Possible points to note**

1) Definition of driver input required to provide stimulus for the control mode of an automated system.

2) When the control mode makes a transition from a system to a driver, how to ensure the transition safe.

3) How to prevent adverse effects on other vehicles and other traffic.

4) The following should also be considered depending on the system; a limited use in specific road environment where safety can be ensured.(e.g. the expressway/highway where the ongoing vehicle lanes are separated by a median from the oncoming vehicle lanes)

5) "Minimum safety measure provision" should be considered so as not to inhibit current development of such systems.