Vehicle certification (mass market products, not testing):

I. Conclusions

1) The development of increasing electronics able to adapt the behaviour of the vehicle to a large variety of situations as well as the possibility of improving these systems in the course of the vehicle lifetime challenge the traditional approach of vehicle approval based on harmonized tests.

2) Functions of the vehicle (braking, steering, field of vision) are currently regulated separately under the approval legislation. The combination of these functions is currently done by the driver. Tomorrow they will be done by the vehicle possibly in coordination with the driver. This may call for a specific regulation combining all these functions together.

3) The replacement of some driver's task as well as connectivity may require new areas to be regulated (e.g. acceleration or distance keeping is not regulated for vehicles today, interoperability for multi brand platooning). How far shall we go/traffic rules? What can be left to standardization?

4) The requirements for vehicles designed for a specific trip may not need to be harmonized but be approved locally to meet the infrastructure (e.g. geofenced shuttles).

5) There will be a multitude of possible use cases for automated driving with different involvement expected from the driver. In addition these use cases will evolve with the improvement of technology. Legislating by use cases has therefore its limits. A general approach compassing the different possible use cases could also be useful.

6) Some topics are already being discussed (cybersecurity in UNECE). What is missing is a comprehensive approach to set priorities.

7) Research and large scale tests to investigate new method of assessing the safety of automated vehicles.

II. Recommendations

1) Keep the type-approval concept based on pre-market test but complement it with and/or alternative methods to vehicle tests, like risk analysis, hardware in the loop,etc.

2) Need for technical services/type-approval authorities to update their competence in electronic system certification.

3) A dose of self-certification could be considered.
There are limit to what can reasonably tested/assessed by technical services at reasonable cost. In addition Manufacturers shall remain responsible for the safety of their products after its approval.

4) Consider to extend the type-approval concept to cover the case where the vehicle is updated when it is already in circulation

5) Identify issues that should be addressed by use cases and those that should be approached horizontally (e.g. cybersecurity). Topics already identified

- **No need to mandate V to V (MS declaration In the NL HLG). Interoperability to be covered (e.g. multi brand platooning)?**
- **Access to data: RMI/remote diagnostic already regulated. EU Competition rules and data protection shall apply to general access to vehicle data**
- **Cybersecurity: wait for on-going in UNECE to be finalized by 2017.**
- **Data storage already covered by 2020 recommendations**
- **HMI to be covered including interaction with other road users.**
- **Other topics to be regulated? e.g. longitudinal control, monitoring of the environment, monitoring of the driver.**

TRL study proposes some improvements. May need to be supplemented.