

OICA PRELIMINARY DRAFT COMMENTS. THIS DOES NOT CONSTITUTE THE FINAL OICA POSITION.

Submitted by the expert from technical secretary [with OICA comments](#)

Document No. ITS/AD-AH-02-04

(ITS/AD 2nd ad-hoc, 9-10 March 2017, agenda item 3-1)

A proposal for the Definitions of Automated Driving under WP.29 and the General Principles for developing a UN Regulation

- The following table reflects the general principles for automated driving systems as WP.29. These principles will be treated as guidelines for developing a new regulation related to automated driving systems at WP.29.
 - The control systems that intervening in case of emergency (AEB, ESC, ~~Deadman~~Emergency in case of medical conditions, etc.) are not included in these definitions of automated driving.
 - The control functions that avoid dangers caused by unpredictable traffic conditions (goods/luggage dropping, frozen road, etc.) or other drivers' illegal driving behaviors are not considered in this table.
- The regulation on automated driving needs to have new specific performance requirements and verification tests under various conditions depending on each level.
- In discussing system requirements, it is desirable to organize them by level as well as by road way type (1: limited space; 2: motorway; 3: urban road).
- The following table shows the distinguish way of level of automated driving under WP.29 at this present considering the results of discussions so far and the assumed use cases. This table should be reconsidered appropriately in accordance with each concept of automated driving system to be placed on the market in the future.
- The main revision points on this meeting is distinguished in blue font.

	Monitor by Driver The driver may not perform secondary tasks activities			Monitor by System The driver may perform secondary tasks activities		
	Monitor by Driver	Monitor by Driver (a)	Monitor by Driver (b)	Monitor by System (Return to Driver Control on System Request)	Monitor by System Full Time under defined use case	Monitor by System only
Ref. SAE Level (J3016)	1: (system takes care of longitudinal or lateral control, monitoring by the driver)	2: (the system takes care of both longitudinal and lateral control). Monitoring by driver (monitoring by system allowed?) necessary because the system is not able to detect all the situations in the use case. The driver shall be able to take over intervene at any time		3: The system copes with situations or will otherwise transition to the driver offering sufficient lead time (driver is fallback) is able to cope with any situations in the concerned use case, which includes the period of transition to driver control, the The system drives and monitors (specific to the use-case) the environment, and is able to warn the driver sufficiently in advance if a takeover is necessary in the use case. The system detects system limits and issues a transition demand if these are reached.	4: The system is able to cope with any situations in the concerned use case (fallback included), Driver not necessarily needed during specific use-case, e. g. Vallet Parking/ Campus Shuttle . It may however request a takeover if the use case boundaries are reached (e.g. motorway exit).	5: The system is able to cope with any situations on all road types, speed ranges and environmental conditions. No driver necessary.
Outline of Classification	The vehicle cannot be driven without the driver's continuous operation.	The driver and the system share dynamic driving tasks (see SAE's definitions) under limited driving environments and conditions	The system occasionally performs all dynamic driving tasks <u>within its designed use-case upon driver's demand.</u>	The systems do not require the driver to provide fallback performance	The system always operates all dynamic driving tasks.	
		The system offers to operate in response to the driver's request, or to operate the vehicle for the driver just for a limited period (short time)*. *GRRF expert group should quantify	The system offers to operate the vehicle for the driver for a certain period (Long time)* which the driver requests. *GRRF expert group should quantify	Only secondary tasks-activities with appropriate reaction time are allowed (e.g. texting, internet surfing, video-telephony)	All secondary tasks-activities are allowed within the use case boundaries (e.g. motorway).	
Consideration points on development of regulation	Same as current principle (manner)	Same as current principle (manner) Driver normally is forced to engage in dynamic driving tasks in order to address changes in the driving environment. The regulation needs to consider an arrangement that ensures the driver's involvement in dynamic driving tasks even when the system is in control. With respect to systems of level 2b consideration should be given to the minimum level of the data capture concerning system status. Furthermore, for system of level 2b consideration should be also given for requirement for minimal risk maneuver.	The regulation needs to require that the driver is in a condition (driver availability) that enables him or her to resume operation of dynamic driving tasks when the driver must resume the driving task (transition demand by the system) under other than the use-cases. The system shall be able to detect its own functional limitations. With respect to systems of level 3 consideration should be given to the minimum level of the data capture concerning system status. Furthermore, for system of level 3 consideration should be also given for requirement for minimal risk maneuver and emergency braking.	The system is able to cope with all situations in the use case (fallback included), <u>driver availability may be required, not necessarily needed.</u> (OICA homework) Some Level 4 functions do not require a driver (e.g. campus shuttle) at all (driverless). OICA: Regarding Lv4 and Lv5, the discussion regarding regulatory activities need to be initiated. OICA understands that this document constitutes a "living document" that may be extended as positions are established.	The system is able to cope with all situations in the use case (fallback included), driver availability is not necessary any more. OICA: Regarding Lv4 and Lv5, the discussion regarding regulatory activities need to be initiated. OICA understands that this document constitutes a "living document" that may be extended as positions are established.	

コメントの追加 [BB1]: OICA is of the opinion that tasks should be replaced by activities, since these are not "tasks" that the driver must fulfil, rather "activities" in which the driver may engage.

コメントの追加 [BB2]: OICA attempted to further clarify the Lv3 herein, without changing the common understanding of Lv3.

コメントの追加 [BB3]: OICA is of the opinion that the system performs in a reproducible manner within its designated use-case.

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Harmonization-Compatibility with traffic law (WP.1)	Yes	Yes	Yes	[WP.1-IWG-AD recommends WP.1 to state that the use of these functions remain within the requirements of the Conventions.]	[WP.1-IWG-AD recommends WP.1 to state that the use of these functions remain within the requirements of the Conventions. These are functions whereby a driver is still available at the end of the use-case. Functions that do not require a driver (e.g. campus shuttle) at all (driverless) are still in discussion – except for those that do not interact on/with public roads.]	Note:- Harmonization with the existing regulation on a driverless traffic system is necessary. Further consideration necessary to reflect driverless systems before a conclusion can be made.
Examples of the necessary potential system performance requirements						
Override (e.g. steering, braking, accelerating) function by the driver	O (Necessary in general)	O (Necessary in general)	O (Necessary in general)	AD (necessity depends on the system) Necessary in General	Δ (Unnecessary during part-time) Depending on the design/performance of the function.	X (Unnecessary)
Aspects of arrangement that ensures the driver's involvement in dynamic driving tasks (driver monitoring, etc.)	Δ (detection of hands-off when Lv1 addresses LKAS)	Δ (at least detection of hands-off as necessary).	O (detection of driver's readiness-availability for performing the driving task: e.g. hands off detection, driver availability recognition system, head and/or eye movement and/or input to any control element of the vehicle)	O (detection of driver's availability to takeover the driving task upon request or when required: e.g. seated/unseated, reminder to the driver to avoid that he falls asleep etc.) – driver availability recognition system e.g. head and/or eye movement and/or input to any control element of the vehicle)	OX (System that depends on the driver's conditions that can resume to driving operation) Unnecessary	X (Unnecessary)
Aspects of arrangement that ensures the driver's resumption of dynamic driving tasks (transition periods to the driver, etc.)	X (Unnecessary not applicable)	X (Unnecessary not applicable)	O (Periods based on the condition which that the driver does not involve in sub-tasks.)	O (sufficient periods that considers the driver's performance of sub-tasks, e.g. if applicable the vehicle infotainment system showing non-driving relevant content to be deactivated automatically when transition demand is issued).	OX (periods that depends on the driver's conditions that can resume to driving operation) Unnecessary	X (Unnecessary)
System reliability (E-safety) OICA: What is meant exactly by E-safety?	Reliability considering the driver override	Reliability considering the driver override Reliability considering the transition periods to the driver. According to SAE J3016 there is no transition period/demand for a Level 2 function.		Reliability considering the transition periods to the driver performing sub-tasks	Reliability of the system's performance of safe driving	
Comprehensive recognition of surrounding environment (sensing, etc.)	The area to be monitored depends on the system function (Lateral or longitudinal directions) Direction of travel only. However, it is the task of the driver to perform the Object and Event Detection and Response (no system performance requirement).	The area to be monitored depends on the system function (Lateral and/or longitudinal directions) However, it is the task of the driver to perform the Object and Event Detection and Response (no system performance requirement).		Lateral and longitudinal directions The area to be monitored depends on the system function (Lateral and longitudinal directions) However, it is the task of the system to perform the Object and Event Detection and Response (system performance requirements necessary).		
Recording of system status (inc. system behavior) (DSSA-Data Storage System for ACSF, EDR, etc.)	X (Unnecessary)	X (Unnecessary)	OX Unnecessary, as the driver is instructed and expected to perform the OEDR at all times	O (the driver's operations and the system status (inc. system behavior))	O (the system status (inc. system behavior))	

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コメントの追加 [BB5]: Unnecessary during the Lv4-use case.

コメントの追加 [BB4]: A Lv3-system still requires a driver. The driver thus shall basically have a/the mean(s) to override the function.

コメントの追加 [BB6]: When Lv1 addresses ACC only, no hands-off detection is required.

コメントの追加 [BB7]: As stated above, the system copes with all situations and does not need the driver during use-case. Thus, the driver is not involved in the driving task.

コメントの追加 [BB8]: See comment above

コメントの追加 [BB9]: OICA attempted to simplify and in the same time clarify the means of detection using the SAE J3016-term OEDR (Object and Event Detection and Response).

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			(the driver's operations and the system status (inc. system behavior))			
Security (E-security) CyberSecurity	0 (Necessary if the information communication in <u>automated and</u> connected vehicles, etc. affects the vehicle control)					
Summary of the current conditions and the issues to be discussed (specific use cases)						
<u>Dedicated areas/areas with specific rules for traffic</u> Roads where entry is regulated except for motor vehicles (inc. a part of urban roads)	o Already put into practice To be developed (standardized guideline etc) as necessary	<ul style="list-style-type: none"> Automated parking by the driver's remote control (monitoring) (RCP [Remote Control Parking], to be discussed by ACSF-IWG?) CAT A, B1 in combination with long. control (under discussion) Categories B2 to E under ACSF (amendment of R79) 		Partially outside of the scope of discussion at WP.1 (currently possible to be discussed at WP.29)	Partially outside of the scope of discussion at WP.1 (currently possible to be discussed at WP.29) - <u>Requirements need to be developed</u>	
Roads exclusively for motor vehicles (inc. a part of urban roads) (Explantaion: These roads are intended to be used solely by motorcycles, trucks and autovehicles)	<ul style="list-style-type: none"> LKA (draft standards) ACC (no specific performance requirements) ACSF Cat.B1 (Steering Function hands-on) IPA (Intelligent Parking Assist) 	(Under discussion) <ul style="list-style-type: none"> Categories A-E under ACSF (amendment of R79) 		To be discussed with the amendment of Conventions by WP.1 taken into account <ul style="list-style-type: none"> Highway chauffeur Under discussion ACSF B2, B2+E 	To be discussed with the amendment of Conventions by WP.1 taken into account <u>Requirements need to be developed</u>	
Urban and interurban roads		<ul style="list-style-type: none"> ACC+ACSF (Cat. B1, Cat.C (Basic Lane Change Assist), Cat.D [Smart LCA]) 	<ul style="list-style-type: none"> Under discussion ACSF Cat. E ACSF Cat.B2 (Continuous Lane Guidance hands-off) 	To be discussed with the amendment of Conventions by WP.1 taken into account - <u>Requirements to be defined</u>	To be discussed with the amendment of Conventions by WP.1 taken into account <u>Requirements need to be developed</u>	
		<ul style="list-style-type: none"> CAT A, B1 in combination with long. control (combination with C, D to be clarified in IWG ACSF) 				
		<ul style="list-style-type: none"> To be discussed as the second phase of ACSF 				

コメントの追加 [BB1]: OICA is of the opinion that tasks should be replaced by activities, since these are not "tasks" that the driver must fulfil, rather "activities" in which the driver may engage.

コメントの追加 [BB11]: This will be evaluated in the Row "Harmonization with traffic law (WP.1)" above. Applies to all comments in this section that refer to WP.1 and to "Conventions".

コメントの追加 [BB10]: Driver physically involved in the driving task.

コメントの追加 [BB12]: There is a dedicated row for WP.1 discussion

コメントの追加 [BB13]: Justification:
The specifications above indicate that B2, B2+E can be technically a Lv3.