Document drafted in the ACSF IWG – 16th session

ITS/AD ACSF-06-28 OICA-proposal BASt

ITS-AD Document Vehcile Task (Lv3 functionalities)		Level 3 Reqs drafted by IWG ACSF	ACSF 06-28 (Sections B2, E)
The system is able to cope* with all dynamic driving tasks within its Operational Design Domain (ODD) or will otherwise transit to the driver offering sufficient lead time (driver is fallback). The system detects system limits and issues a transition demand if these are reached. *The Level 3 system is e.g. not expected to provide a corridor for emergency vehicle access or to follow hand signals given by traffic enforcement officers. The driver needs to remain sufficiently vigilant as to acknowledge and react on these situations (e. g. when he hears the sirens of an emergency vehicle in close vicinity).		General consideration: - which traffic situations the system has to master - which kind of situations have to result in a transition demand (depending on the boundaries of the ODD) - which value of lead time is sufficient ODD (Operational Design Domain): Requirement in regulation: highway* up to the speed defined by the vehicle manufacturer, but not exceeding 130 km/h *: as declared in category C	
1. Execute longitudinal (accelerating/braking) and lateral (steering) portions of the dynamic driving task when activated. Shall monitor the driving environment for operational decisions when activated.	1. Consider which regulatory provision for longitudinal (accelerating, braking) and lateral control (steering) are necessary including the monitoring of the driving environment.	The system can cope with all dynamic driving tasks within its ODD. The following examples give an overview about possible situation which have to be considered. Actually not all situations can be detected by the system. • Construction area, • Narrow lane, • Narrow curve, • Inclement weather, • Other vehicle cutting in, • Other vehicle cutting out with, obstacle in front, • Different kind and sizes of obstacles, • animals, • Other vehicle broken down and covering lane only partly (plus pedestian aside this car?), • Low mu, • Different kinds of failures • Detection of signs of policemen	Lateral control: 1 < aysmax < 3 m/s2 Monitor front and sides, to avoid or mitigate collisions: sFront > vACSF2 / (2*3.7m/s²) sside > 7 m Emergency manoeuver (protective braking)

		• Detection of emergency vehicles • Detection of contact with other object The system shall know which traffic rules applies and follow them (within the ODD); e.g. • Detection of traffic signs, and subsigns System performance has to correspond to the activities that are allowed for the driver during the ODD Regulatory provisions for longitudinal (accelerating, braking) and lateral control (steering) are necessary. Provisions for emergency braking (or even emergency steering) measures by the system if the time for a proper transition procedure is too short The requirements shall define the performance of the dynamic driving task including OEDR (e.g. protective braking)	
2. Permit activation only under conditions for which it was designed. System deactivated immediately at the request of the driver. However the system may momentarily delay deactivation when immediate human takeover could compromise safety.	2. Consider regulatory provision to ensure the system: i) Permits activation only under conditions for which it was designed, and ii) Deactivates immediately upon request by the driver. However the system may momentarily delay deactivation when immediate driver takeover could compromise safety.	2i: see ODD 2ii: Override: Necessary (yet may differ from L2 requirements) Ensure that the system deactivates immediately upon request by the driver (or delays deactivation when immediate driver takeover could compromise safety)	Road Type: Highway and roads with contructional separation (no pedestrians, cyclists)… Overriding: Operation by the driver shall have priority

3. System automatically deactivated only after requesting the driver to take-over with a sufficient lead time; may – under certain, limited circumstances – transition (at least initiate) to minimal risk condition if the human driver does not take over. It would be beneficial if the vehicle displays used for the secondary activities were also used to improve the human takeover process.	3. Consider regulatory provision to ensure the system automatically deactivates only after requesting the driver to take-over with a sufficient lead time; including – under certain, limited circumstances – transition (at least initiate) to minimal risk condition if the driver does not take over. It would be beneficial if the vehicle displays used for the secondary activities were also used to improve the human takeover process.	Transition period of at least 4 seconds (tbc by existing studies). The system shall detect its limits and finalize the transition periode before these are reached. MRM shall start at the end of the transition period (which may be longer than the minimum required transition period). The driver must be informed that he shall at any time be able to respond to transition demands from the system. Give information to the driver, that any side task is permitted within the limits of the behavior law. The "infotainment" shall disengage as soon as a transition demand is sent. System shall inform the driver about the actual driving status: Information given to the driver has to be designed in a way that the driver always knows which part of the driving task is carried out by the system and which kind of behaviour is expected from him and which tasks are expected to be carried out by him.	Transition period > 4s (nominal and non-fault and single sensor failure) Failures other than single sensor : failsafe strategy of Annex 6 Distinctive warning Transition demand MRM Deactivating of infotainment content not relevant to driving when the TD is issued
4. Driver availability recognition shall be used to ensure the driver is in the position to take over when requested by the system. Potential technical solutions range from detecting the driver's manual operations to	4. Consider regulatory provision for driver availability recognition is used to ensure the driver is in the position to take over when requested by the system.	Provide technical means to detect that the driver is in a position to take over control within the transition demand period, e.g. by checking the driver is in the seat and is additionally showing regular activities / interactions and/or head and/or eye movement	Driver in the seat. Seat belt fastened. Show activity every [3] minutes.

monitoring cameras to detect the driver's head position and eyelid movement.			
~~5. Emergency braking measures must be accomplished by the system and not expected from the driver (due to secondary activities).~~	~~5. Consider regulatory provision for emergency braking measures by the system.~~		~~Emergency manoeuver (protective braking)~~
System reliability	Consideration shall be given to evaluation of the system reliability and redundancy as necessary.	B2 level 3 has to be fail-operational, at least as long as the transition procedure is taking place. The functional safety of the system shall be considered in the context of CEL assessment.	
Recording of system status (inc. system behavior) (DSSA-Data Storage System for ACSF, EDR, etc.)	The driver's operations and the system status (incl. system behavior).	Record the driver's operations and the system status (incl. system behavior) in the DSSA.	[DSSA proposal]
Cyber-Security	Necessary if the information communication in connected vehicles, etc. affects the vehicle control	Depending on the outcome of the Cyber Security/Over the Air Update - Task Force of the IWG ITS/AD.	
PTI – not included in ITS/AD document		Consideration of PTI: Offering the possibility to carry out a beneficial periodical check of roadworthiness It has to be considered how to verification of correct operational status in a simple way to use a failure warning signal to use an electronic communication interface. How to do the confirmation of valid software version is depending on the outcome of the Cyber Security/Over the Air Update - Task Force of the IWG ITS/AD.	Not in ACSF-06-28 included, however some papers for ACSF-Type Approval Number have been proposed