GRRF recommendations to the IWG on ACSF on the basis of GRRF-86-20-Rev.1			Level 3 Reqs drafted by IWG ACSF (Tokyo-Jan '18)	ACSF-06-28 overview	Extract	X-ref		Pilot	
1. General considerations / establish the limits of the system	**GRRF**	*** Which traffic situations does the system have to master?** - Highway conditions (as defined for ACSF of Category C) - Max operation speed? Consider opt.1 max[80 km/h] or traffic jam assist, opt.2 Vmax, Commonality to both: core set of performance requirements? Possibly: as defined in the ODD declared by OEM, with a minimum set. - 100% of normal situations within ODD then: initiate Transition Demand (TD) / minimum risk maneuver / emergency maneuver. - Consider activation only if system verified that it can manage the situation (within the ODD) - Traffic rules considerations: system shall know which traffic rules apply and follow them (within its ODD). Examples: .Detection of relevant traffic signs and subsigns, incl. variable message signs etc. .Compliance with highway code: ACSF to develop methodology suitable for use in the context of Mutual Recognition to verify the vehicle capability to comply with traffic rules. *** Which kind of situations result in a transition demand (depending on the boundaries of the operational design domain (ODD)?** Planned transition(s), unplanned transition(s), transition(s) when boundaries are exceeded, emergency transition(s) – considerations on Secondary Tasks (ST), see WP.1 discussions *** Which value of lead time is sufficient?** Decision based on research necessary / consider human behavior issues. Vehicle performance impacts TD, lead time value and allowed ST.	**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						
2. Operational design domain (ODD)	**GRRF**	*Slide not reviewed/commented in detail by GRRF. (See slide "1. General considerations").* **Highway* up to the speed defined by the vehicle manufacturer, but not exceeding 130 km/h.** * as declared in ACSF of Category C (UNECE/R79 → § 5.6.4.2.3): "Activation by the driver shall only be possible on roads, where pedestrians and cyclists are prohibited and which, by design, are equipped with a physical separation that divides the traffic moving in opposite directions and which have at least two lanes in the direction the vehicles are drivine."		Road Type: Highway and roads with contructional separation (no pedestrians, cyclists)…					
3. Dynamic driving tasks		**System can cope with all dynamic driving tasks within its ODD:** **Examples of possible situation**s, which have to be considered (Actually, not all situations can be detected by the system): - Construction area, - Narrow lane or curve, - Inclement weather, - Low friction coefficient of road surface, - Obstacles/ animals, - Other vehicle broken down, covering lane partly (pedestrian), - Detection of signs of police officers, - Detection of emergency vehicles, … - Accomodate easy access to motorway of other vehicles – [as well as other requirements from traffic code] - [Cope with platooning] – maybe at a later stage	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 • Detection of emergency vehicles • Detection of contact with other object		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).				
a. Dynamic control or the vehicle (longitudinal control, ACC, emergency braking and steering; OEDR…)		**Regulatory provisions for longitudinal control** (accelerating, braking) and lateral control (steering) are necessary. Longitudinal control: ACC, (non-) emergency braking (throttle / brake).. (candidate for a structured (w/ agenda) webex meeting within 4 weeks) **Provisions for emergency braking measures** (incl. emergency steering measures [outside / within the lane]) by the system, if the time for a proper transition procedure is too short. (keep provisions consistent with UN Regulation No. 131) **The requirements shall define the performance of the dynamic driving task including object and event detection response (OEDR) (e.g. protective braking)**. [Considerations for provisions on: detection / sensor technology, max speed as function of sensor performance, deterioration, fog situation where sensor sees better than driver etc.] [Candidate for a structured webex meeting before the next ACSF meeting]	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)	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)	1. Consider which regulatory provision for longitudinal (accelerating, braking) and lateral control (steering) are necessary including the monitoring of the driving environment.				
b. Manual override			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)	Overriding: Operation by the driver shall have priority	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.	item 6. on HMI			
c. Transition procedure (and period), linked to driver monitoring			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.	- Transition period > 4s (nominal and non-fault and single sensorfailure) - Distinctive warning - Transition demand - MRM	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.	item 5. on MRM item 6. on HMI			
4. System reliability ("Annex 6" + testing + redundancy considerations)	**UK**		82 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.	Failures other than single sensor : failsafe strategy of Annex 6	System reliability Consideration shall be given to evaluation of the system reliability and redundancy as necessary.				
5. Minimal risk maneuver (once limits of system are established)			MRM shall start at the end of the transition period (which may be longer than the minimum required transition period).						

6. Information to the driver			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.	Deactivating of infotainment content not relevant to driving when the TD is issued					
7. Driver availability recognition / Driver monitoring			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.	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. Potential technical solutions range from detecting the driver's manual operations to monitoring cameras to detect the driver's head position and evelid movement.				
8. Recording of information / DSSA	**WP29**		Record the driver's operations and the system status (incl. system behavior) in the DSSA.	[DSSA proposal]	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).				
9. Cyber-security	**TF CS & OTA**		Depending on the outcome of the Cyber Security/Over the Air Update - Task Force of the IWG ITS/AD.		Necessary if the information communication in connected vehicles, etc. affects the vehicle control				
10. Periodical technical inspection (PTI)	**SWE**		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	Not considered in ITS-AD document				