

List of open issues

Topic	Sub-topic	Open issue(s)	Positions	Status	Text proposal	Reference																																																						
Speed increase	1. Expected vehicle behaviour in nominal/complex situations?	Para 5.2.3.3.: Minimum headway/safety distance	<p>(DE): For the minimum safety distance the approach was a linear scale with the DE requirement of 1.8 s at speeds of 80 km/h or above and a lower limit of 1.0 s at slow speeds in a traffic jam with an absolute minimum of 2 m). Above (80 km/h /) 100 km/h was defined to meet traffic law (1.8 s (DE) / 2 sec (other CPs)). Interpolation between 60 km/h and 100 km/h.</p> <p>(JP)The table should not be deleted because the requirement like "the vehicle shall not cause collision" is ambiguous and considered differently between TSS, and the minimum requirements for important parameters are effective in order to ensure safety. Without table, there is some concern for approval of ADS with substandard level. Japan is discussing internally the concrete value. Japan will provide proposal at the following SIG. Notwithstanding this requirement, appropriate following distance for complying other requirements (e.g. traffic rules, avoid collisions) should be maintained.</p> <p>(OICA/CLEPA): (02-07): The required safety distance to the front of an ALKS is much more dependent on the collision avoidance requirement we impose on the system than the permitted minimum distance according to Par. 5.2.3.3. So as long as we expect the ALKS to avoid a collision with a stopped vehicle ahead even after a late lane change of the lead vehicle, the vehicle will have to be operate at a significant safety distance to the vehicle in front.</p> <p>JRC: No need for a table as already covered by collision avoidance requirements+risk for traffic flow+possible contradiction with traffic rules. SE: Keep the table (as proposed by DE) UK : keen to keep the table as 2 sec is in traffic rules</p>	TBD	<p>DE text:</p> <table border="1"> <thead> <tr> <th><i>Present speed of the ALKS vehicle</i></th> <th><i>Minimum time gap</i></th> <th><i>Minimum following distance</i></th> </tr> <tr> <th>(km/h)</th> <th>(m/s)</th> <th>(m)</th> </tr> </thead> <tbody> <tr><td>7.2</td><td>2.0</td><td>2.0</td></tr> <tr><td>10</td><td>2.78</td><td>3.1</td></tr> <tr><td>20</td><td>5.56</td><td>6.7</td></tr> <tr><td>30</td><td>8.33</td><td>10.8</td></tr> <tr><td>40</td><td>11.11</td><td>15.6</td></tr> <tr><td>50</td><td>13.89</td><td>20.8</td></tr> <tr><td>60</td><td>16.67</td><td>26.7</td></tr> <tr><td>70</td><td>19.44</td><td>33.1</td></tr> <tr><td>80</td><td>22.22</td><td>40.0</td></tr> <tr><td>90</td><td>25.00</td><td>47.5</td></tr> <tr><td>100</td><td>27.78</td><td>55.6</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th><i>Present speed of the ALKS vehicle</i></th> <th><i>Minimum time gap</i></th> <th><i>Minimum following distance</i></th> </tr> <tr> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr><td>110</td><td>30.56</td><td>61.1</td></tr> <tr><td>120</td><td>33.33</td><td>66.7</td></tr> <tr><td>130</td><td>36.11</td><td>72.2</td></tr> </tbody> </table>	<i>Present speed of the ALKS vehicle</i>	<i>Minimum time gap</i>	<i>Minimum following distance</i>	(km/h)	(m/s)	(m)	7.2	2.0	2.0	10	2.78	3.1	20	5.56	6.7	30	8.33	10.8	40	11.11	15.6	50	13.89	20.8	60	16.67	26.7	70	19.44	33.1	80	22.22	40.0	90	25.00	47.5	100	27.78	55.6	<i>Present speed of the ALKS vehicle</i>	<i>Minimum time gap</i>	<i>Minimum following distance</i>				110	30.56	61.1	120	33.33	66.7	130	36.11	72.2	<p>ECE/TRANS/WP.29/GRVA/2020/32 (DE proposal) UNR157-02-07 (OICA/CLEPA) UNR157-03-04 (SE) UNR157-03-06 (EC) UNR157-03-08 (JP)</p>
<i>Present speed of the ALKS vehicle</i>	<i>Minimum time gap</i>	<i>Minimum following distance</i>																																																										
(km/h)	(m/s)	(m)																																																										
7.2	2.0	2.0																																																										
10	2.78	3.1																																																										
20	5.56	6.7																																																										
30	8.33	10.8																																																										
40	11.11	15.6																																																										
50	13.89	20.8																																																										
60	16.67	26.7																																																										
70	19.44	33.1																																																										
80	22.22	40.0																																																										
90	25.00	47.5																																																										
100	27.78	55.6																																																										
<i>Present speed of the ALKS vehicle</i>	<i>Minimum time gap</i>	<i>Minimum following distance</i>																																																										
110	30.56	61.1																																																										
120	33.33	66.7																																																										
130	36.11	72.2																																																										
	5.2.7. String stability/No negative effect on traffic flow	EC: String stability general requirements as in 03-06	<p>(OICA/CLEPA): Instability often results from driver expected behavior (e.g. driving off quickly, driving at fairly low following distance requiring strong system response to other road users). None of this applies to the ALKS. The ALKS "can take its time", driving off moderately, reacting less strong because of the higher following distances. Therefore we do not really see this as an issue that should explicitly be addressed.</p> <p>(JP)It is premature to implement this requirement because there are few vehicles with ADS in the market.</p>	TBD	<p>[5.2.7. The stability of the vehicle and driver system is a necessary condition that must be always met, provided that effects of unplanned events disturbing the safe motion are within reasonable limits. This shall be demonstrated in the assessment of the tests carried out in accordance with Annex 4 and 5 of this Regulation. 5.2.8. While following another vehicle the ALKS vehicle shall be string stable. This shall be demonstrated in accordance with Annex 5 of this Regulation.]</p>	<p>UNR157-02-07 (OICA/CLEPA) UNR157-03-06 (EC)</p>																																																						

7.1.1.1. :Minimum front detection range	<p>Parameters to be used?</p> <p>(DE/FR): 5 m/s2 (modern vehicle braking capability under wet conditions), 0,5 sec reaction time.</p> <p>(SE/JP): 3,7 m/s2+0,5 sec reaction time</p> <p>(SE): Need to redraft the following para to ensure the speed is continuously adapted to ensure the detection range required (according to table), due to different conditions: <i>It is recognized that the minimum forward detection range cannot be achieved under all conditions. Nevertheless, the system shall implement appropriate strategies in order to ensure safe operation at all times.</i></p>	TBD	<p>A specified maximum speed above 60 km/h shall only be declared by the manufacturer, if the declared forward detection range fulfils the corresponding minimum value according the following table:</p> <table border="1" data-bbox="1191 220 1982 526"> <thead> <tr> <th style="text-align: center;"><i>Specified maximum speed</i> km/h</th> <th style="text-align: center;"><i>Minimum forward detection range</i> m</th> </tr> </thead> <tbody> <tr><td>0...60</td><td>46</td></tr> <tr><td>70</td><td>50</td></tr> <tr><td>80</td><td>60</td></tr> <tr><td>90</td><td>75</td></tr> <tr><td>100</td><td>90</td></tr> <tr><td>110</td><td>110</td></tr> <tr><td>120</td><td>130</td></tr> <tr><td>130</td><td>150</td></tr> </tbody> </table> <p style="text-align: center;">Section Break (Next Page)</p> <p>For values not mentioned in the table, linear interpolation shall be applied.</p> <p>It is recognized that the minimum forward detection range cannot be achieved under all conditions. Nevertheless, the system shall implement appropriate strategies in order to ensure safe operation at all times.</p>	<i>Specified maximum speed</i> km/h	<i>Minimum forward detection range</i> m	0...60	46	70	50	80	60	90	75	100	90	110	110	120	130	130	150	ECE/TRANS/WP.29/GRVA/2020/32 (DE proposal) UNR157-02-07 (OICA/CLEPA) UNR157-03-04 (SE) UNR157-03-08 (JP)
<i>Specified maximum speed</i> km/h	<i>Minimum forward detection range</i> m																					
0...60	46																					
70	50																					
80	60																					
90	75																					
100	90																					
110	110																					
120	130																					
130	150																					
Speed limits: varies in each country, how should they be treated under the Regulation? (JP)	(JP)No need to modify UNR157 text because compliance to speed limit is covered by "traffic rule requirement". (OICA/CLEPA): Yes, and we understand this to be the case even with the current ALKS provisions, because the system has to comply with the traffic rules related to the DDT, and even though they do not occur frequently, in some areas speed limits below 60km/h do exist. So this should already be covered by the existing ALKS text	TBD		UNR157-02-07 (OICA/CLEPA) UNR157-03-08(JP)																		
Line between type approval/traffic rules (JP: Are there any cases where following traffic law could cause danger? If so, how should we treat those cases in regulation)	Priority of safety over traffic rules?? (JP) This issue cannot be dealt with WP29 since vehicle regulation/guideline cannot permit vehicle to break traffic rules. This issue should be considered in WP1. Before reaching any conclusion from the discussion above, we propose to keep the provision of "the activated system shall comply with traffic rules" in 5.2.1.	TBD																				
Combination of higher speed with lane change: Wouldn't the system have to be able to change lanes e.g. to provide space at a highway entrance?	(OICA/CLEPA) Even when the system was capable of performing lane changes the adjacent lane could be occupied so the system would have to have a strategy to behave safely even if a lane change was not possible. And the same applies for a system that is not capable of a regular lane change. It will have to establish operating strategies to ensure safe operation	TBD		UNR157-02-06 (OICA/CLEPA)																		
2. Expected reaction of the vehicle to critical situations	Any differences with ALKS low speed which need particular consideration?	TBD																				

		5.2.4. wrong way driver scenario	(EC) proposal to include wrong way driver scenarios+ removing the reference to complete stop (depends on the scenario). (JP) The ADS shall detect the risk of "wrong way driver" and perform appropriate manoeuvres to minimize risks. (support EC proposal.). "Appropriate manoeuvre" should be as safe as or better than competent and careful human driver.EC proposal to change "bring the vehicle to a complete stop" to "be able to handle in a safe way" seems not appropriate since this modification seems to change the requirement into less stringent way. Japan proposes to keep the original requirement of 5.2.4 as it is, and add additional paragraph requiring the issues that should be handled in a safe way.	TBD	5.2.4. The activated system shall be able to bring the vehicle to a complete stop behind a stationary vehicle, a stationary road user or a blocked lane of travel to avoid a collision. This shall be ensured up to the maximum operational speed of the system. (EC)5.2.4. The activated system shall be able to handle in a safe way the presence in the same lane of bring the vehicle to a complete stop behind a stationary vehicle, a stationary road user, a passable or unpassable obstacle [debris, lost cargo, etc.], or a blocked lane of travel to avoid a collision. This shall be ensured up to the maximum operational speed of the system. (EC)5.2.5. The activated system shall detect the risk of collision in particular with another road user ahead or beside the vehicle, due to a decelerating lead vehicle, a cutting in vehicle, a vehicle proceeding in the opposite direction or a suddenly appearing obstacle and shall automatically perform appropriate manoeuvres to minimize risks to safety of the vehicle occupants and other road users.	UNR157-03-06 (EC)
		Model for scenarios (e.g. cut-in) as defined currently in UN R 157 appropriate for higher speeds (> 60 km/h)?	(DE) No change proposed on cut-in/ cut-out,decelerating front vehicles. (EC): Alternative model merging the DE and JP model (JP) If some CPs propose to change the requirement completely (e.g. EC proposal), that proposal should be discussed firstly in FRAV.	TBD		
		5.2.2.3 Pedestrian scenario: To what level should pedestrian crossing be covered? (it could be difficult to avoid a collision in a high-speed area but what should be the level required under the Regulation?) (JP)	(DE) Focus was to guarantee pedestrian collision avoidance/mitigation up until 60 km/h. Does not mean that standing pedestrian should not be managed. (JP)Collision to a pedestrian in the same lane shall be avoided. ADS should avoid collision in front of the ego vehicle as safe as a human driver. If necessary, we can accept to discuss amendments to current test procedure from the point of view above. Japan is discussing internally the case in which a pedestrian is standing beside the lane. Japan will provide proposal at the following SIG.	TBD		ECE/TRANS/WP.29/GRVA/2020/32 (DE proposal) UNR157-03-08 (JP)
		Is it necessary to consider situations where lane marking is not visible ?	(JP)No need to modify UNR157 text because it is obvious that the vehicle should keep control until the transition to the driver even if the lane marking is disappeared suddenly. (During MRM, the case when the lane marking is not visible is already described (5.5.1.1).)	TBD	(Current ALKS text) 5.4.4.1. In case the driver is not responding to a transition demand by deactivating the system (either as described in paragraph 6.2.4. or 6.2.5.), a minimum risk manoeuvre shall be started, earliest 10 s after the start of the transition demand.	UNR157-03-08 (JP)
		Is evasive emergency manoeuvre required? Distinction < 80 km/h and above?	(JP)The function of evasive emergency manoeuvre should be optional (i.e. not mandatory but may be fitted). If the function of evasive emergency manoeuvre is fitted, it is necessary that the function can only be activated when the braking is not capable of avoiding accidents.	TBD		
		What would be the boundary between dense traffic and free driving with regard to whether a Lane Change capability is required?	The boundary is understood with regard to whether it is permitted to use any lane or restricted to a certain lane (e.g. slowest available lane).	TBD		UNR157-02-06 (OICA/CLEPA)
		During evasive emergency manoeuvre, is it permitted to cross lane marking ?	(JP)The function of evasive emergency manoeuvre should be optional (i.e. not mandatory but may be fitted). If the function of evasive emergency manoeuvre is fitted, it is necessary that the function can only be activated when the braking is not capable of avoiding accidents.	TBD		
Lane change	1. Type of lane changes/scenario for lane changes	Shall different types of lane change be defined (nominal, during MRM and evasive)?	(JP) "during MRM", "evasive manoeuvre", "regular lane change" should be clearly differentiated. (see UNR157-02-05) (OICA/CLEPA): Description of different lane change/lane crossing described in UN157-02-06	TBD		UNR157-02-05 (JP) UNR157-02-06 (OICA/CLEPA)

	Wouldn't changing lanes in traffic jam scenarios be different because the gaps are smaller?	(OICA/CLEPA): The general approach to regulating ALKS lane changes should apply to any type of lane change. Individual parameters, e.g. distance to another vehicle following behind, that we deem to be safe might have to be adapted for individual scenarios.			UNR157-02-06 (OICA/CLEPA)
	What would be the boundary between dense traffic and free driving with regard to whether a Lane Change capability is required?	(OICA/CLEPA): The boundary is understood with regard to whether it is permitted to use any lane or restricted to a certain lane (e.g. slowest available lane).	TBD		UNR157-02-06 (OICA/CLEPA)
	What are the items that need to be strengthened when compared to ACSF category C?	(JP)[REGULAR] Lv3 Lane change during normal driving (not emergency situation) should consider the situation around the ego vehicle including forward and side (including 2 lane next). These requirements should be discussed in FRAV. (note: Detection of forward and side are not required in ACSF provisions.) [MRM] The requirements for Lane change during MRM should be discussed based on ACSF category C (can be based on category E but the requirements are not yet specified). [EVASIVE] The requirements for evasive manoeuvre is difficult to define because the impact of secondary accident (i.e. collision to vehicle passing the next lane) should be considered. The function of evasive emergency manoeuvre should be optional (i.e. not mandatory but may be fitted). If the function of evasive emergency manoeuvre is fitted, it is necessary that the function can only be activated when the braking is not capable of avoiding accidents.	TBD		UNR157-03-08 (JP)
2. Rerequirement for a safe lane change	Should criteria for permitting lane change be defined? If so, what should be the criteria?	(JP) See above.	TBD		
	Need to define what is a safe lane change (parameters or general principles?)	(JP) See above.	TBD		ECE/TRANS/WP.29/GRVA/2020/33 (DE proposa) UK proposal on lane change for MRM UNR157-03-06 (EC)
	How would we ensure that the ODD conditions are still met in the new lane?	(OICA/CLEPA): ALKS would still have to fulfill all general ALKS requirements in the new lane (e.g. with regard to collision avoidance or operation during a transition demand). So the system would have to ensure that it can continue to operate in the lane that a lane change is performed into	TBD		UNR157-02-06 (OICA/CLEPA)
	Need to define triggering conditions for lane change. Should aim to prevent erratic lane change. (NO)	(JP) See above. (OICA CLEPA): A lane change that is performed while the ALKS is active is initiated by the system in a situation in which the system assesses the lane change to be necessary and possible. Instead of defining trigger conditions permitting/prohibiting lane changes under certain circumstances, we should define what we consider to be a safe lane change (i.e. with regard to manageable behavior by other traffic). What is considered to be safe can potentially vary depending on the preconditions, e.g. when the vehicle already indicated an emergency situation through active hazard warning lamps (MRM), surrounding traffic might be expected to react sooner.	TBD		UNR157-02-06 (OICA/CLEPA)
	Shall driver interruption (over ride) during auto lane change be acceptable? What kind of action should be required for override during auto lane change? (JP)	(JP)No special modification to present text is needed.	TBD		

		Is there any other additional requirement necessary for the Level 3 lane change function? (JP)		TBD		
		Is it necessary to decide a minimum detection range for directions other than forward (side, diagonal)? (JP)	(JP) The requirement of MRM lane change can refer the requirement of risk mitigation function (RMF), which is under discussion in ADAS-TF. Regarding regular lane change, the requirement should be discussed in FRAV.	TBD		
Both	1. Traffic situations	Any additional traffic situations which need particular attention and possibly need to be introduced? (based on VMAD input)		TBD		
	2. MRM	During MRM, is it acceptable to stop within the lane? Or should lane change to the shoulder (lane change during MRM) be mandatory? (JP)	(JP)Having the function to change lane to the shoulder (lane change during MRM) should be mandatory for ADS with ODD higher than 60km/h because a stopped vehicle in highway without traffic jam is dangerous. (It is important to have the function of MRM lane change and it can be allowed that MRM lane change is not achieved under some conditions (e.g. when shoulder does not exist).)	TBD		
	3. HMI	Any change/improvement to current HMI requirement given that more time will be spent without any intervention from the driver? Further harmonization needed?	(JP) We do not see any necessity to change the current requirement at this time. However, we should reflect conclusion coming from FRAV and VMAD if any. (EC): Need to review driver monitoring requirement as the driver will be longer out of the loop with higher speed/lane change functions?	TBD		
	DSSAD/EDR	Need to update DSSAD/EDR requirements for speed extension/lane change				
	4. Test, Audit & In-service monitoring	During Type Approval, what type of tests should be conducted or provided by the documentation? (Should current requirement be further clarified?) (JP)	(JP) We do not see any necessity to change the current requirement at this time. However, we should reflect conclusion coming from VMAD if any.	TBD		Proposal from OICA/CLEPA on tests in GRVA?
		Need to improve present test, especially track tests?	(JP) We do not see any necessity to change the current requirement at this time. However, we should reflect conclusion coming from VMAD if any. (EC): Need for new test for lane change+wrong way driver? (OICA/CLEPA): proposal for lane change tests. No need to change tests for higher speed?	TBD		UNR157-03-06 (EC)
		Does the audit and in-service monitoring need enhanced?	(JP) We do not see any necessity to change the current requirement at this time. However, we should reflect conclusion coming from VMAD if any. (EC): Need to update audit and in-service monitoring requirements for higher speed/lane change?	TBD		UNR157-03-06 (EC)
	Lifetime consideration (wear and tear, load variation, different environmental conditions, replacement parts, different update of the vehicles, change due to traffic rules such as winter tyres)		(F): How should vehicle configuration changes be taken into account by the approval process ? §Should they be part of the ODD ? §Should they be managed by the vehicle owner/driver if not detected by the ADS itself ? And then how should the vehicle owner/driver be informed of that ? How will the system cope with different grip conditions depending on the road and the vehicle's tire fitment during the vehicle's lifetime?How will the system comply with local traffic rules in winter (mandatory special equipment on specific roads & countries) without recognizing its tires?	TBD		UNR157-02-04 (F)

			OICA/CLEPA: In responses to FR questions on lifetime considerations, there are responsibilities (e.g. appropriate tyres, snow tyres, proper load, load properly secured) that remain with the driver because the driver will have driven the vehicle manually before ALKS becomes active. Beyond that, ALKS needs to implement strategies to copewith reasonably expected changes in vehicle configuration (e.g. different load conditions, different permitted tyres fitted to the vehicle, different tyre age) and external influences (e.g. varying grip conditions of the road). What exactly these strategies are will be demonstrated to the Technical Service during Type Approval.			UNR157-03-07																																																																							
Clarifying Regulation	1. Emergency vehicles	How should a vehicle respond? Is it with transition demand or shall it create a corridor?		TBD	2.5. "Unplanned event" is a situation which is unknown in advance, but assumed as very likely in happening, e.g. road construction, inclement weather, approaching emergency vehicles, missing lane marking, load falling from truck (collision) and which requires a transition demand. This may include road construction, inclement weather, approaching emergency vehicles/enforcement vehicles, missing lane marking, load falling from truck (collision). 5.1.2. The activated system shall comply with traffic rules relating to the DDT in the country of operation including responding to emergency/enforcement vehicles.	UNR-157-03-12 (OICA)																																																																							
		Does the system need to react to the direction of an enforcement officer? (UK)		TBD																																																																									
	2. Detectable collision	What is a detectable collision? (UK)		TBD	5.1.1. ... When the vehicle is involved in a detectable significant collision with another road user while ALKS is active , the vehicle control strategy shall be brought to bring the vehicle to a standstill. +Update Annex 5 accordingly (replace "detectable" by "significant")	UNR-157-03-12 (OICA)																																																																							
Other modifications	1. Appendix3 to Annex4	Should Appendix 3 to Annex4 be replaced?	(JP)Current Appendix3 to Annex4 is important to assess the human driver level. Therefore, Japan suggests to keep current Appendix3 with amendment (e.g. speed extension). If other CP requests to add other requirement, we can discuss to add it as other Appendix or something else.	TBD																																																																									
HDV ALKS below 60 km/h*		Maximum deceleration value (para. 5.5.1): Current requirements applicable to M1 are limiting the maximum deceleration during the MRM to 4m/s ² ; should this value be adapted to other vehicle categories, given the lower deceleration potential of heavier categories compared to passenger cars?	JP: 4m/s ² can be acceptable because no safety concern has been observed. (However, buses with standing passengers should require additional consideration.) OICA/CLEPA: The MRM in para. 5.5.1. requires a deceleration not greater than 4 m/s ² . That means a lower value is possible. The minimum brake performance required by R13 for service braking system is 5 m/s ² . A deceleration value of 4 m/s ² reflects the expectations of the other traffic participants and therefore it is independent from the ego-vehicle. So there is no difference in the perception if a passenger car or a CV is decelerating.	TBD	<table border="1"> <thead> <tr> <th rowspan="2">a (average)</th> <th colspan="2">v</th> <th colspan="2">s-brake</th> <th>following distance</th> <th>time gap (In R137 for M1)</th> <th>time gap (proposal)</th> </tr> <tr> <th>[km/h]</th> <th>[m/s]</th> <th>[m]</th> <th>[m]</th> <th>[m]</th> <th>[s]</th> <th>[s]</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>7,2</td> <td>2,00</td> <td>0,4</td> <td>1,2</td> <td>2,4</td> <td>1,0</td> <td>1,2</td> </tr> <tr> <td>5</td> <td>15</td> <td>4,15</td> <td>0,8</td> <td>2,4</td> <td>4,8</td> <td>1,1</td> <td>1,4</td> </tr> <tr> <td>5</td> <td>20</td> <td>5,56</td> <td>3,1</td> <td>5,3</td> <td>8,9</td> <td>1,2</td> <td>1,6</td> </tr> <tr> <td>5</td> <td>30</td> <td>8,33</td> <td>6,9</td> <td>10,3</td> <td>15,0</td> <td>1,3</td> <td>1,8</td> </tr> <tr> <td>5</td> <td>40</td> <td>11,11</td> <td>12,3</td> <td>16,8</td> <td>22,2</td> <td>1,4</td> <td>2,0</td> </tr> <tr> <td>5</td> <td>50</td> <td>13,89</td> <td>19,3</td> <td>24,8</td> <td>30,6</td> <td>1,5</td> <td>2,2</td> </tr> <tr> <td>5</td> <td>60</td> <td>16,67</td> <td>27,8</td> <td>34,4</td> <td>40,0</td> <td>1,6</td> <td>2,4</td> </tr> </tbody> </table>	a (average)	v		s-brake		following distance	time gap (In R137 for M1)	time gap (proposal)	[km/h]	[m/s]	[m]	[m]	[m]	[s]	[s]	5	7,2	2,00	0,4	1,2	2,4	1,0	1,2	5	15	4,15	0,8	2,4	4,8	1,1	1,4	5	20	5,56	3,1	5,3	8,9	1,2	1,6	5	30	8,33	6,9	10,3	15,0	1,3	1,8	5	40	11,11	12,3	16,8	22,2	1,4	2,0	5	50	13,89	19,3	24,8	30,6	1,5	2,2	5	60	16,67	27,8	34,4	40,0	1,6	2,4	UNR-157-02-10 (OICACLEPA)
a (average)	v		s-brake		following distance		time gap (In R137 for M1)	time gap (proposal)																																																																					
	[km/h]	[m/s]	[m]	[m]	[m]	[s]	[s]																																																																						
5	7,2	2,00	0,4	1,2	2,4	1,0	1,2																																																																						
5	15	4,15	0,8	2,4	4,8	1,1	1,4																																																																						
5	20	5,56	3,1	5,3	8,9	1,2	1,6																																																																						
5	30	8,33	6,9	10,3	15,0	1,3	1,8																																																																						
5	40	11,11	12,3	16,8	22,2	1,4	2,0																																																																						
5	50	13,89	19,3	24,8	30,6	1,5	2,2																																																																						
5	60	16,67	27,8	34,4	40,0	1,6	2,4																																																																						

<p>Minimum following distance (para. 5.2.3.3.): The requirements define a table with the minimum following distance between a passenger car equipped with an active ALKS and the preceding vehicle. Industry is expected to review whether and how the HCVs parameters impacts the values in the table.</p>	<p><u>JP:</u> Minimum following distance should be calculated by the same method as M1 by using HDV parameters(the distance with maximum deceleration). In favor to keep table in general. <u>DE:</u> The minimum following distances in the table for ALKS60 are defined according to traffic rules and reasonable deceleration values and not directly linked to the minimum performance of the service brake of a special vehicle category. If required, special provisions for the minimum safety distance exist for special vehicles in the national traffic rules (e.g. 50 m above 50 km/h in DE). The general requirement to avoid any collision remains valid, therefore no system is forced to only drive with the minimum safety distance if the braking performance might be too low. Values in the table need reconsidering and checking, if applicable in all countries. <u>JRC:</u> no need for table in general as this distance will in any case depend on the traffic situation and traffic rules and proposed instead a general requirement on safety distance keeping <u>OICA/CLEPA:</u> Suggestion to add a special column for M2/M3/N2/N3 in the table based on the following approach: - Using a deceleration value of 5 m/s² (minimum performance of the service brakes in R13) for each speed value for the calculation - Using a brake delay of 0.4s (linear increase up to full brake performance --> 0.8s/2) for each speed value for the calculation - Ensuring that the minimum following distance is always greater than the calculated braking distance</p>	TBD		<p>GRVA/2021/03 (OICA/CLEPA) UNR-157-02-10 (OICA/CLEPA) UNR157-03-09 (OICA) UNR157-03-05 (DE) UNR157-03-08 (JP)</p>
<p>Minimum forward detection range (para. 7.1.1.): for HDV and influence of vehicle dynamics for safety distance to the front/detection range.</p>	<p><u>JP:</u> The same requirements as M1 can be acceptable. <u>DE:</u> The requirement for '7.1.1. Forward detection range' is also linked to the minimum following distance. The actual 46 m in R 157 ALKS are derived from an average braking performance calculation and the requirements for the minimum following distances of a M1 vehicle with a max. speed of 60 km/h. For other vehicles one of these two parameters may be above the required 46 m (e.g. required min. following distance of 50 m for some vehicles and speeds within the range of 60 km/h). Therefore the min. forward detection range should be adjusted accordingly or the better solution would be to remove an explicit detection range completely. <u>OICA/CLEPA:</u> The Calculation of the 46m is based on a speed of 60 km/h, a deceleration of 3.7 m/s² and delay of 0.5s. These values are also useable for M2/M3/N2/N3. The minimum following distance was not a parameter in that discussion.</p>	TBD		
<p>TTC Lane intrusion (para. 5.2.5.2.): In the section about the cutting-in scenario, should the parameter "TTCLaneIntrusion" be modified, considering the width of HDVs compared to a passenger car?</p>	<p><u>JP:</u> No need to modify UNR157. <u>DE:</u> No modifications needed for the "TTCLaneIntucion" calculation for other vehicle categories. (The value describes more a criticality of a situation to be avoided and not directly a minimum braking performance of the ALKS vehicle. There is already far enough space in the calculation of the critical point in time and the reaction of the ALKS vehicle with the additionally introduced 0.72 s perception time. For the safety of the other road users it is not justifiable, why an automated truck should be allowed to have more collisions (with even more potential consequences) than a passenger car. 6 m/s² in good road conditions is also manageable with a heavy truck. There is no need to go down to a relatively old requirement of a minimum deceleration performance of 5 m/s² for a modern truck that is built to drive automated.) <u>OICA/CLEPA:</u> No influence on the TTC by the width of the ALKS-vehicle. No value in the equation is depending on the width of the ALKS vehicle. TTC is a time, which is depending on the rear-most point of the cutting in vehicle and the front most point of the ALKS vehicle. The 0.3 m is just a defined value which specifies the point when the vehicle is intruding in the lane of the ALKS vehicle. This is independent of the width of the ALKS vehicle.</p>	TBD		<p>GRVA/2021/03 (OICA/CLEPA) UNR-157-02-10 (OICACLEPA)</p>