



Informal document GRVA-10-34  
10th GRVA, 25-28 May 2021  
Provisional Agenda item 4(d)

# *Update from the Special Interest Group on UN Regulation 157*

# Meetings of the group

## Five meetings held so far:

- #1 on 15<sup>th</sup> January 2021
- #2 on 16<sup>th</sup> February 2021
- #3 on 18<sup>th</sup> & 19<sup>th</sup> March 2021
- #4 on 15<sup>th</sup> & 16<sup>th</sup> April 2021
- #5 on 10<sup>th</sup> & 11<sup>th</sup> May 2021

## Three more scheduled:

- #6 on 10<sup>th</sup> & 11<sup>th</sup> June 2021
- #7 on 8<sup>th</sup> & 9<sup>th</sup> July 2021
- #8 on 13<sup>th</sup> & 17<sup>th</sup> September 2021

Meeting documents can be found [here](#)

# Items addressed by SIG on UN R157

- Higher Speeds
- Lane Change
- Introduction of HDV
- Clarifications

Topic	Sub-type	Open issue(s)	Positions	Status	Text proposal	Reference
Speed increase	1. Expected vehicle behavior in non-trivial complex situations?	<b>Para 5.2.3.3.3. Minimum headway/safety distance</b>	<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 TS, 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>(OCA/CLEPA) Industry believes the safety distance is influenced by the collision avoidance requirements. We hoped ALKS would establish an understanding that permitted the ALKS to drive at smaller following distances when able to provide the necessary level of safety and understood the table therefore to describe the actual minimum for ALKS, regardless of human-driver centered traffic rules. When this understanding is overturned, the table is of no benefit and could be removed, as safety is already ensured by the following provisions on collision avoidance with stationary obstacles.</p> <p>(IRC) 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>		<p>DE text: Paragraph 5.2.3.3.3. amended to read: 5.2.3.3.3. The activated system shall detect the distance to the next vehicle in front as defined in paragraph 7.1.1. and shall adapt the vehicle speed in order to avoid a collision. While the ALKS vehicle is not at standstill, the system shall adapt the speed to adjust the distance to a vehicle in front in the same lane to be equal or greater than the minimum following distance. In case the minimum time gap cannot be respected temporarily because of other road users (e.g. vehicle is cutting in, decelerating lead vehicle, etc.), the vehicle shall recalculate the minimum following distance or the next available opportunity without any harsh braking unless an emergency manoeuvre would become necessary. The minimum following distance shall be calculated using the formula: [FORMULA] [TABLE (amended speed &gt; 60 km/h)] For speed values not mentioned in the table, linear interpolation shall be applied. Notwithstanding the result of the formula above for present speeds below 2 m/s the minimum following distance shall never be less than 2 m. The requirements of this paragraph are without prejudice to other requirements in this Regulation, most notably paragraphs 5.2.4. and 5.2.5. with subparagraphs.</p> <p>TD</p> <p>EC proposal: Paragraph 5.2.3.3.3. amended to read: 5.2.3.3.3. The activated system shall detect the distance to the next vehicle in front as defined in paragraph 7.1.1. and shall adapt the vehicle speed in order to avoid a collision. While the ALKS vehicle is not at standstill, the system shall adapt the speed to adjust the distance to a vehicle in front in the same lane to be equal or greater than the minimum following distance. In case the minimum time gap cannot be respected temporarily because of other road users (e.g. vehicle is cutting in, decelerating lead vehicle, etc.), the vehicle shall recalculate the minimum following distance or the next available opportunity without any harsh braking unless an emergency manoeuvre would become necessary. The minimum following distance shall be calculated using the formula: [FORMULA = TABLE deleted] The requirements of this paragraph are without prejudice to other requirements in this Regulation, most notably paragraphs 5.2.4. and 5.2.5. with subparagraphs.</p>	<p>ECU/TRANS/WP.29/GVA/2020/32 (DE proposal) UNR157-02-07 (UNR157-02-07) (OCA/CLEPA) UNR157-01-04 (SE) UNR157-01-06 (EC) UNR157-01-08 (JP)</p>
		<b>String stability: No negative effect on traffic flow</b>	<p>EC: String stability general requirements as in 03-06</p> <p>(OCA/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 strongly because of the higher following distances. Therefore we do not really see this as an issue that should explicitly be addressed. As long as the provisions on collision avoidance remain as they are there will be little freedom for lower following distances anyway.</p> <p>(JP) It is premature to implement this requirement because there are few vehicles with ADS in the market.</p>		<p>EC proposals: Insert new definitions to read: 2a. "Stability of vehicle and driver system" is the ability of the system composed by the vehicle and the driver, either human or non-human, to recover the initial safe motion after a disturbance. 2a. "String stability" is the capability of the ALKS vehicle to react to a perturbation in the speed profile of the vehicle in front, whose speed profile directly affects the speed profile of the ALKS vehicle, with a perturbation in its speed profile of lower or equal absolute magnitude.</p> <p>TD</p> <p>Paragraph 5.2.1. amended to read: 5.2.1. The activated system shall keep the vehicle inside its lane of travel and ensure that the vehicle does not cross any lane marking (outer edge of the front tyre to outer edge of the lane marking). The system shall aim to keep the vehicle in a stable lateral position inside the lane of travel to avoid confusing other road users.</p> <p>EC proposal: Paragraph 5.2.7. amended to read: 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.</p> <p>TD</p> <p>Paragraph 5.2.8. amended to read: 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 (OCA/CLEPA) UNR157-03-06 (EC)</p>
			<p>EC proposal: Paragraph 5.3.2. amended to read: 5.3.2. This manoeuvre shall decelerate the vehicle up to its full braking performance if necessary and/or may perform an automatic evasive manoeuvre, when appropriate. If failure or offsetting the braking or steering performance of the system, the manoeuvre shall be carried out with consideration for the remaining performance. During the evasive manoeuvre the ALKS vehicle shall not cross the lane marking (outer edge of the front tyre to outer edge of the lane marking). After the evasive manoeuvre the vehicle shall aim at resuming a stable position motion.</p> <p>TD</p>			

Open Points list: [UNR157-05-05.xlsx](#)

# Higher Speeds

## Parameters for safety distance

- Based on deceleration or national traffic rules (i.e. 2 second rule)?

## Detection Range

- Is there a need to specify or shall it be based on braking performance?

## String stability

- Do we need to specify such requirement?

## Change to the driver model

- Suggestion to create a unified model (see [UNR157-05-12](#))

## Evasive lane change/MRM lane change

- Are these required for higher speeds?

## Pedestrian & wrong way driver scenario

# Lane Change

## Definition of different lane changes

- Potential definitions of lane change (see [UNR157-05-10](#))

## Parameters to be used for the lane changes

- Is ACSF-C sufficient or is RMF relevant?

## Triggering conditions for lane changes

## Audit/test requirements for lane changes

# Higher Speeds & Lane Change

Changes to the HMI and driver monitoring requirements

DSSAD event data for higher speeds and lane change

Improvements to information document and introducing interpretation document

- To ensure all necessary information is provided for assessment and the Regulation is applied in a consistent way (see [UNR157-04-09](#))

**Working drafts:**

- Higher speeds: [UNR157-05-06](#)
- Lane changes: [UNR157-05-07](#)

Final proposals expected for September GRVA

# Introduction of HDV

## Changes to [GRVA/2021/03](#)

- Modification minimum following distance
- Collision avoidance for cutting in vehicle remains the same
- Reference to compliance with national traffic rules for sensing requirements
- Equivalent for retrievability of data
- Demonstration of sensing strategies for trailer length (TBC)

Consolidated proposal for adoption:

[GRVA-10-26](#)

# Clarifications to UN R157

## Response to emergency vehicles

- Agreed that emergency and enforcement vehicle should be responded to by the ALKS
- Either through transition demand or manoeuvring in compliance with national traffic rules

## Detectable collisions

- Provision understood to be safety strategy to bring vehicle to a stop in case system has failed as a result of collision
- Does not preclude vehicle from being brought to a stop or issuing a transition demand in the event of any collision as required by national traffic rules

Proposal on clarifications for adoption: [GRVA-10-25](#)

No progress on continuation of assistance after ALKS deactivated ([GRVA/2021/02](#))





UNITED NATIONS  
ECONOMIC COMMISSION  
FOR EUROPE

Thank you for your attention.