

Proposal for amendments to GRVA-05-07r3 (ALKS draft)

This document proposes amendments to GRVA-05-07r3, based on the amendments introduced by GRVA-06-02.

Proposed changes to the current text of the proposal are marked in **bold** for new text, and ~~strike through~~ for deleted text.

I. Proposal

Paragraph 5.2.5.2. of document GRVA-06-02, amend to read

- “5.2.5.2. The activated system shall avoid a collision with a cutting in vehicle,
- provided the cutting in vehicle maintains its longitudinal speed which is lower than the longitudinal speed of the ALKS vehicle and
 - [provided that the **lateral movement of the** cutting in vehicle has been ~~clearly visible~~ **detectable** to the ALKS vehicle’s sensors for a time of at least [0.72] seconds before the reference point for *TTCLaneIntrusion* is reached,]
 - when the distance between the vehicle’s front and the cutting in ~~road~~ ~~user’s~~ **vehicle’s** rear corresponds to a TTC calculated by the following equation:

$$TTCLaneIntrusion > v_{rel}/(2 \cdot 6m/s^2) + [0.35s]$$

Where:

v_{rel} = relative velocity between both vehicles, positive for vehicle being faster than the cutting in vehicle

$TTCLaneIntrusion$ = The TTC value, **that would result if the ALKS vehicle maintained its longitudinal movement**, when the outside of the tyre of the intruding vehicle’s front wheel closest to the lane markings crosses a line 0.3 m beyond the outside edge of the visible lane marking ~~to~~ **from** which the ~~intruding~~ **cutting in** vehicle is being drifted.”

Paragraph 5.2.5.3., amend to read

- “5.2.5.3. The activated system shall avoid a collision with an unobstructed crossing pedestrian in front of the vehicle **up to the maximum operational speed of the system for crossing scenarios as specified according to Regulation No. 152. For any other crossing scenario the system shall mitigate the risk at least to the extend that a human driver would be capable of.**”

Paragraph 6.1.4., amend to read

- “6.1.4. **Other activities than driving through on-board displays permitted in the country of operation exclusively when the ALKS is active shall be automatically suspended as soon as the system issues a transition demand or is deactivated whichever comes first.**”

Paragraph 6.2.1., amend to read

- “6.2.1. The vehicle shall be equipped with dedicated means for the driver to activate (active mode) and deactivate (off mode) the system. **When the ALKS is activated this means to deactivate the system** ~~This~~ shall be permanently visible to the driver.”

II. Justification

A. Paragraph 5.2.5.2., Collision avoidance in a cut-in scenario

The proposed amendments aim to ensure the scenario really justifies an intervention. This does not so much depend on the time the vehicle was visible, but on the time the vehicle was observed to be laterally moving – which is needed to differentiate between a real cut-in and a drift.

Furthermore it is necessary to specify, that the `TTCLaneIntrusion` is the value that would result if both vehicles maintained their longitudinal speed. If the ALKS vehicle reacts to a cut-in vehicle before the 30cm are reached, this should not modify the scenario as described by the formula.

B. Paragraph 5.2.5.3., Collision avoidance with regard to crossing pedestrians

The reference to UN-R152 (AEBS M1/N1) was deleted, because it did not have any effect if the first sentence of this provision remained unchanged. This sentence in its original form would require the ALKS to prevent any collision with any unobstructed crossing pedestrian. This is physically not possible to achieve, because it would even cover a scenario, where a pedestrian would jump out into the road right in the moment the ALKS vehicle passes that pedestrian. That collision cannot be avoided, because the system cannot take any measures to prevent it from happening.

The proposed amendment therefore aims to clarify that the provision applies to a scenario where the pedestrian was constantly moving, so could be observed to be approaching the lane before the actual imminent risk of collision as specified by UN-R152. In addition to all scenarios not covered by the specification according to UN-R152 the system shall aim to mitigate the risk comparably to a human driver.

C. Paragraph 6.1.4., “other activities than driving”

Proposal for wording to better reflect the intention of the paragraph.

D. Paragraph 6.2.1., Permanent visibility of the means for the driver to activate and deactivate the system

The purpose of “permanently visible” is to ensure that the driver doesn’t have to search through a menu to find the means to deactivate the ALKS. But it should include physical means as well as digital means, so e.g. a button that becomes visible as soon as a touch display is powered on after ignition on or the system is available. The current wording doesn’t include this, which is why the proposal aims to amend the original wording.
