

Proposal for amendments to ECE/TRANS/WP.29/GRVA/2021/10

This document proposes minor corrections to GRVA/2021/10 in red ~~strickethrough~~ for deleted and red **bold** for new text.

I. Proposal

Paragraph 5.6.4.6.4.1., update illustration to prescribed timing:

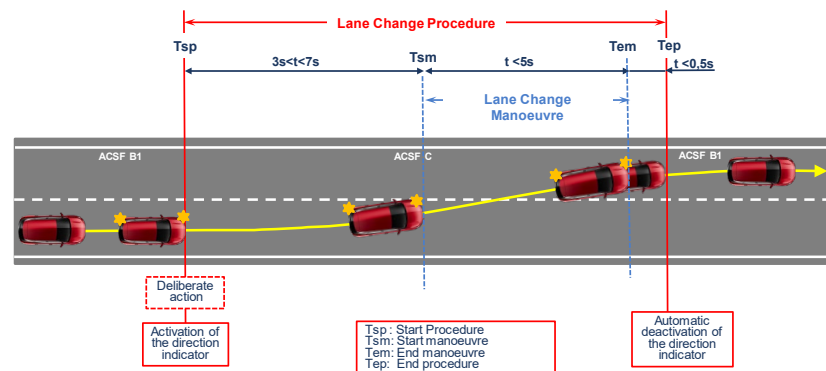
5.6.4.6.4. The lateral movement of the vehicle towards the intended lane shall not start earlier than 1 second after the start of the lane change procedure. Additionally, the lateral movement to approach the lane marking and the lateral movement necessary to complete the lane change manoeuvre, shall be completed as one continuous movement.

The lane change manoeuvre shall be initiated either automatically or by a second deliberate action of the driver. A vehicle shall not be equipped with both these means of initiation.

5.6.4.6.4.1. Automatic initiation of the lane change manoeuvre

In case of an automatic initiation the lane change manoeuvre shall commence between 3.0 seconds and ~~7.0~~ **7.0** seconds after the manual activation of the procedure as described in paragraph 5.6.4.6.2. and shown in the Figure below. **The manoeuvre shall commence at the earliest opportunity if the situation is not deemed critical as defined in 5.6.4.7.**

**ACSF C – Case where the lateral movement is initiated automatically
(1 Step HMI)**



Annex 8, paragraph 3.5.1.2., amend to read:

3.5.1.2. The requirements of the test are fulfilled if:

(a) The lateral movement towards the marking does not start earlier than 1 second after the lane change procedure was initiated,

- (b) The lateral movement to approach the lane marking and the lateral movement necessary to complete the lane change manoeuvre are completed as one continuous movement,
- (c) The recorded lateral acceleration does not exceed 1 m/s²,
- (d) The moving average over half a second of the lateral jerk does not exceed 5 m/s³,
- (e) The measured time between the start of the lane change procedure and the start of the lane change manoeuvre is not less than 3.0 seconds and not more than **7.0 seconds**:
 - ~~(i) 5.0 seconds in the case of an automatic initiation,~~
 - ~~(ii) 7.0 seconds in the case of an initiation by a second deliberate action~~
 - ~~whatever is appropriate.~~
- (f) For systems with an initiation of the lane change manoeuvre by a second deliberate action,
 - (i) The measured time between the start of the lane change procedure and the second deliberate action is not more than ~~7.0~~ **5.0** seconds, and
 - (ii) The measured time between the second deliberate action and the start of the lane change manoeuvre is not more than 3.0 seconds.
- (g) The system provides information to the driver to indicate that the lane change procedure is ongoing,
- (h) The lane change manoeuvre is completed in less than 5 seconds for M₁, N₁ vehicle categories and less than 10 s for M₂, M₃, N₂, N₃ vehicle categories,
- (i) ACSF of Category B1 automatically resumes after the lane change manoeuvre is completed, and
- (j) The direction indicator is deactivated not before the end of the lane change manoeuvre and no later than 0.5 seconds after ACSF of Category B1 has resumed.

Paragraph 5.6.4.6.8.1, amend to read:

- 5.6.4.6.8.1. The lane change procedure shall be suppressed automatically by the system when at least one of the following situations occurs before the lane change manoeuvre has started:
- (a) The system detects a critical situation (as defined in paragraph 5.6.4.7.);
 - (b) The system is overridden or switched off by the driver;
 - (c) The system reaches its boundaries (e.g. lane markings are no longer detected);
 - (d) The system has detected that the driver is not holding the steering control at the start of the lane change manoeuvre;
 - (e) The direction indicator lamps are manually deactivated by the driver;
 - (f) Following the deliberate action of the driver to start the Lane Change procedure described in paragraph 5.6.4.6.2., the lane change manoeuvre has not commenced:

- (i) At the latest after ~~7.0~~ 5.0 seconds, ~~in the case of an automatic initiation,~~
- (ii) ~~At the latest after 7.0 seconds, in the case of an initiation by a second deliberate action,~~
- (iii) At the latest after 3.0 seconds after the second deliberate action, in the case of an initiation by a second deliberate action,
 whatever is appropriate
- (g) The system, with an initiation of the lane change manoeuvre by a second deliberate action, has not detected the second deliberate action at the latest ~~7.0~~ ~~5.0~~ 5.0 seconds after the start of the lane change procedure.
- (h) The lateral movement described in paragraph 5.6.4.6.4. is not continuous.

II. Justification

1. OICA basically support the document GRVA/2021/10.
2. There are scenarios in which 5s from the start of direction indicator activation is not sufficient to start the lane change manoeuvre, e.g. when there is a long vehicle passing by on the adjacent lane.
3. Normal driver behaviour in this situation is to indicate the intention to change lanes to vehicles from behind while the other vehicle is still passing.
4. This is especially important in dense traffic when following distances tend to be lower, because this indicates to a vehicle following behind the need to open up more space.
5. Indicating the intention to change lanes for up to 7s before the start of the lane change manoeuvre was already accepted by the adoption for the provisions for a system requiring a second deliberate action (Supplement 2 to the 03 Series).
6. The lane change behaviour is especially relevant to the vehicle coming from behind. From the point of view of that vehicle, the ego vehicle behaviour should not differ between a single step or two step activation.
7. As the regulation applies no tolerances, the system will have to decrease the permitted duration by a safety margin, which will result in real max. durations of less than 5s.
8. As the aim is consistent and predictable vehicle behaviour Industry is convinced forcing a suppression of assistance just because the situation requires the lane change manoeuvre to commence a few moments later is not in the best interest of safety.
9. The proposal therefore aims to align the maximum time by which the lane change manoeuvre must have commenced between a system with automatic initiation of that manoeuvre and those systems that require a second deliberate actions.
10. This has in previous GRVA session been indicated by several contracting parties as an agreeable position.
 [see ECE-TRANS-WP.29-GRVA-09e.pdf, par 50]
11. As UN R48 requires indicator frequencies of ~1.5Hz, the maximum timespan of 7s would correspond to 6 indicator pulses additional to those of the 3s initiation (which is 3 additional pulses compared to the current maximum timespan of 5s). Real world experience clearly shows that these 6 additional pulses not only bring no additional risk, but rather improve the driver's awareness.