Regulation ECE R79-03
ACSF C 2-Step HMI

Justification for the timing between
First action and Lane Change Manoeuvre at 7 seconds
OICA presented amendment GRVA-02-24 in 2\textsuperscript{nd} session of GRVA in January 2019, introducing an alternative to ACSF C with a 2-step HMI. This alternative will keep the same performance requirements as ACSF C 1-step HMI.

Conclusion of GRVA-02:

- OICA shall present a formal document for GRVA session of September 2019
- This document shall be based on GRVA-02-24 and include a requirement stating that a vehicle shall not be equipped ACSF C 1-step HMI \textit{and} ACSF C 2-step HMI.
- OICA shall also justify the need for 7 seconds between the start of the lane change procedure until the start of the lane change manoeuvre.
Context
Amendment proposal

Paragraph 5.6.4.6.4., amend to read:

"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 not be initiated before a period of 3.0 seconds and not later than 5.0 seconds after the deliberate action of the driver described in paragraph 5.6.4.6.2. above.

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."

Justification for the 7 seconds
First Study – Time between 1\textsuperscript{st} and 2\textsuperscript{nd} action

Measurement conditions:
• Lane Change Assist Prototype (2-step HMI)
• Number of users driving on highway: 11
• Number of recorded assisted lane changes: 91

For each activation of the Lane Change Assist, we have measured the time between the 1\textsuperscript{st} and the 2\textsuperscript{nd} action of the driver.

* 3 seconds is the maximum timing between the second deliberate action and the lane change manoeuvre
Results

7 seconds are needed !!

Time between the First and the second deliberate action + 3 seconds*

with 5 seconds, ~25% of the LC abort !!

* 3 seconds is the maximum timing between the second deliberate action and the lane change manoeuvre
Conclusion

The measures and tests we have performed for the ACSF C 2-step HMI show that:

→ There will be a significant percentage (up to 23%) of lane change manoeuver aborted if the time between the 1st action and the line crossing is limited to 5 seconds.

A system designed to allow the lane change manoeuvre up to 7 seconds after the 1st action:

→ results in a good controllability
→ results in a good availability of the function

OICA then propose limiting the timing between the first deliberate action and the Lane Change Manoeuvre to 7 Seconds.
Thank you for your attention