

## Invitation to the 8<sup>th</sup> Session of the GRVA Informal Working Group on Functional Requirements for Automated Vehicles (FRAV)

The eighth session of the FRAV informal group is scheduled for 8 December 2020 between 12:30 and 15:00 CET via web conference.

### Session Objectives

The session agenda will cover the following items:

1. Adoption of the agenda
2. Adoption of the reports of the previous sessions
3. FRAV status and consensus
4. ADS level of safety
5. Elaboration of ADS safety requirements
6. Document 5 updates
7. Next Steps and Deliverables

### **The main aims of this session:**

- Build consensus on overall level of safety guiding principle
- Consolidate candidate requirements under five starting points
- Consider updates to Document 5

### Submissions

Given the constraints imposed by the web conference format, the co-chairs wish to adhere to a fixed schedule with time limits for each agenda item. Documents may be submitted for consideration; however, the co-chairs may need to postpone their presentation to a future session. All documents prepared for the session, including the session agenda, will be posted on the [FRAV-08 webpage](#) as available. Documents should be submitted to the [FRAV secretary](#) by **4 December**.

### Additional Background

#### *Level of Safety*

FRAV should distinguish between two aspects of the discussions on performance limits: the guiding principles for ADS performance and the methods available to define performance limits.

At the top level, what is the overall performance aim for the performance limits? Is the aim for ADS to drive the vehicle in the same manner as a qualified and fit human driver respecting best driving practices (i.e., absent the human behaviors known to be the critical factor in more than 90% of all crashes)? Is the aim for the ADS to operate at the limits of technological feasibility? Should ADS meet a standard statistically demonstrating significant improvement over similar vehicles without ADS? Is there some other core principle that should guide determinations on the appropriate performance metrics?

Once FRAV has reached consensus on this guiding principle, the logical step is to consider methods for determining the optimal performance limits. Which method or combination of methods will enable FRAV to generate the data needed to define and justify performance ranges and limits based on the overarching goal? FRAV has identified several methods. FRAV could define a method to analyze human responses to traffic events (human driver perception, recognition, response decision, actuation of controls, latency between human response and vehicle motion, etc.) and apply these to ADS performance requirements. FRAV could define a method to analyze technological capabilities (ADS detection, recognition, classification, response, etc.). FRAV could develop mathematical formulas to determine the “safety

envelope” an ADS should maintain. Which method or combination most efficiently enables FRAV to define performance limits that improve road safety, produce feasible, measurable, performance-based, and technology-neutral specifications conducive to social acceptance of ADS vehicles?

During the 8<sup>th</sup> session, it would be constructive to agree on an overarching principle for the level of safety to be achieved by ADS. Without prejudice to the methods for defining a performance requirement, what benchmark should FRAV use in deciding whether a given requirement meets the desired expectations for driving behavior? Stakeholders are requested to provide input on the overarching level of safety. The aim is to replace paragraph 4.2. of Document 5 with a statement on the overall level of performance expected of ADS (i.e., performance compared against what?).

#### *Elaboration of ADS safety requirements*

FRAV has a raw list of 142 candidates for safety requirements gathered from its stakeholders. MLIT provided a spreadsheet to enable classification of the candidates under the five broad starting points for addressing all aspects of ADS safety (FRAV-06-07). OICA/CLEPA has further categorized (color-coded) the list towards reducing it to its essential safety requirements (FRAV-07-10). Stakeholders are requested to review this work (based on FRAV-07-10) to ensure that all safety interests are covered.

This review relates to three activities in order to produce a clear, consensus list of safety goals:

- Which of the 142 items should be “green” (i.e., included in a shorter list of proposals for consideration)? Given the repetitions and overlaps, FRAV needs to reduce the list to its essentials.
- What changes should be made to the items to meet FRAV’s needs (e.g., split into separate statements, simplified to capture the essence of the safety objective at a higher level)? The aim is to produce a list that guides future elaboration. FRAV needs a list that can be collectively supported without digressing into premature technical discussions.
- Where should each item be classified according to the five starting points? FRAV needs coherent lists under each starting point to form the basis for focusing separately on each safety aspect (i.e., how should the ADS drive and interact with other road users, how should the ADS interact/cooperate with the ADS user, how should the ADS handle safety-critical situations, etc.)?

The aim is to produce a consensus version of document FRAV-06-04 that provides sufficient guidance so FRAV can organize work on specifications under each starting point. The work on specific performance requirements would be guided by the consensus on the overall level of safety principle. FRAV would apply the method(s) the group chooses for generating data to support proposals for specific performance ranges and limits.

#### *Document 5*

Document 5 provides an interim text to facilitate discussions, particularly on specific points that need clarification to enable the drafting of eventual proposals to GRVA and WP.29. The contents of Document 5 remain continuously open to discussion and revision. Document 5 includes draft text provided to address stakeholder comments and solicit feedback. Updated versions of Document 5 are provided regularly to solicit such input from the stakeholders. FRAV will receive a brief review of changes to the current version to highlight areas that stakeholders may wish to comment on between FRAV sessions. Brief comments are welcome during the session, but FRAV (in the interests of time management) generally presents changes and asks stakeholders to provide written comments in between sessions to enable consideration at the following session.