

10th Session Status Review and Session Orientation

Web Conference

27 January 2021

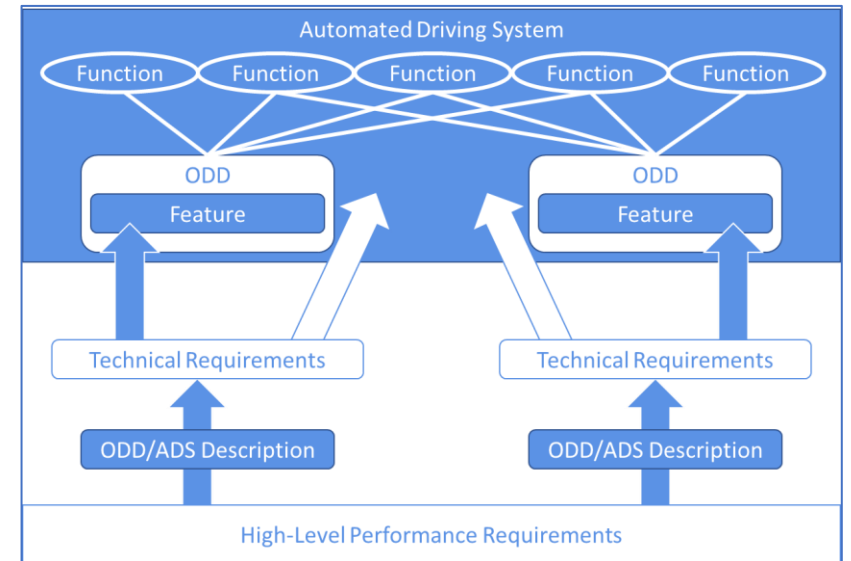


Agenda item	Documentation
1. Adoption of the agenda	12:30-12:45 FRAV-10-01
2. FRAV progress report to GRVA 2.1. ADS definition 2.2. ADS safety requirements structure 2.3. Elaboration of safety requirements 2.4. Status of FRAV activities 2.5. Coordination with VMAD 2.6. 2021 Outlook	12:45-13:45 FRAV-10-09 (Co-chairs)
3. Input on ADS safety requirements 3.1. MRC/MRM 3.2. Open discussion	13:45-14:45 FRAV-09-06 (SAE) FRAV-09-07 (Japan) FRAV-09-08 (Co-chairs) FRAV-10-06 (Japan) FRAV-10-07 (Germany) FRAV-10-08 (China) FRAV-10-11 (Netherlands)
4. Action items and next steps	14:45-15:00

- White paper describing FRAV work
 - Summary for GRVA and others not directly involved in FRAV
 - Explanation of work and intentions, not a proposal or working document
- Six sections
 1. Definition of an Automated Driving System
 2. Structure for ADS safety requirements
 3. Elaboration of ADS safety requirements
 4. Status of FRAV activities
 5. FRAV coordination with VMAD
 6. Outlook for 2021

- Driving and the Dynamic Driving Task (DDT)
 - DDT: All the real-time operational and tactical functions required to operate a vehicle in on-road traffic—excludes strategic functions
- Automated driving and Operational Design Domains (ODD)
 - ODD: The conditions under which an ADS is designed to operate
 - User roles and responsibilities differentiation and constraints
- Automated Driving Systems
 - ADS: A driving automation system capable of performing the entire DDT on a sustained basis
- ADS functions
 - Subsets of ADS hardware and software designed to perform aspects of the DDT and support operational safety
- ADS features
 - Applications of ADS capabilities designed to operate within an ODD

- Scope
 - All ADS (application or usage-specific approach discarded)
 - Category 1 and 2 (SR1): 4+ wheeled vehicles
- ADS descriptions
 - Manufacturer definition of each ADS in accordance with requirements to ensure coverage and uniformity
- ADS safety requirements
 - Objectively applied to any ADS based on its uses and limitations as defined in the ADS description
- Overall approach
 - ADS descriptions enable application of requirements at technical level without interfering with innovation.
 - ADS features assessed on their merits within overall assessment of ADS



- Guiding principle (Please raise concerns, if any)
 - ADS intended for human use in human-dominated traffic
 - Traffic flows, predictability, public acceptance, user mental models, crash causation
 - C&C human driver, state-of-the-art, mathematical models, statistical positive risk balance (all have merits and may be used in combination)
 - Improve road safety and efficiency, performance-based, technology-neutral, verifiable, feasible, social acceptance
 - Explanation of guiding statement
 - Crash causation to understand what can and cannot be addressed by ADS
 - Crash causation to understand behaviors ADS may encounter
 - Addresses smooth integration into current traffic, improvement of road safety, use of new technology
- Top-down approach
 - General discussion → 5 categories → 40 topics → further elaboration

ADS performance should be consistent with safe human driving behaviors while avoiding human recognition, decision, and performance errors and the introduction of unreasonable ADS-specific risks.

- Data collection
 - Understand traffic patterns, flows, and human responses to these conditions
 - Understand causes of crashes and human behaviors ADS may encounter
 - Nominal conditions and safety-critical conditions
- Elaboration of safety requirements
 - Derive measurable/verifiable assessment criteria from the 40 safety topics
 - Apply data and methods to determine specifications for ADS assessment
- Elaboration of ADS description requirements
 - Derive elements that may impact use and performance from the 40 safety topics
 - Define measurable/verifiable terms to describe use constraints and boundaries

- Leadership meetings to coordinate activities and desired outcomes
- Explanation of FRAV activities that may inform VMAD work
 - Scenarios: FRAV deliberations on ODD elements, current traffic patterns, nominal driving, and safety-critical conditions
 - Audit: FRAV deliberations on prerequisite functions and system safety
 - Virtual testing: FRAV deliberations on smooth ADS integration with current traffic
 - Physical testing: FRAV deliberations of performance, ODD exits, HMI, etc.
 - In-service performance: FRAV deliberations on maintaining the safe operational state of the ADS
- Integration under the NATM
 - Procedure to review and verification of ADS descriptions
 - Procedure to determine application of safety requirements to individual ADS
 - Procedure to determine relevance of scenarios to individual ADS

- FRAV aims to address all ADS configurations (not application-specific)
- Recognize interest in motorway applications
 - Anticipate opportunities to prioritize elements of work
 - Aim to address but not be limited to motorway applications
- Recognize VMAD needs
 - Sufficient detail on goals and criteria to support decisions on assessment methods
 - Anticipate increasing collaboration and reference to VMAD outcomes
- Top-down approach moving through phases
 - General discussions → Five categories → 40 topics → Criteria → Specifications
- General outlook and aims (*Please raise concerns, if any*)
 - May 2021: ADS description elements and safety assessment criteria
 - September 2021: Verifiable specifications (covering motorway subset)
 - February 2022: Package covering descriptions and requirements (covering motorway subset)

“*Minimal risk condition*” means a condition to which a user or an ADS may bring a vehicle after performing the DDT fallback in order to reduce the risk of a crash when a given trip cannot or should not be completed due to a DDT performance-relevant system failure in the ADS and/or other vehicle system failure, upon exit from the ODD, and/or a lack of necessary input from the user.

Proposition for FRAV consideration

- Principle: A definition states what something is
 - How, why, etc. should be described elsewhere
- Conceptually, an MRC means that the vehicle is stopped in a position where the risk of harm is minimal given the available options. (MRC is the end result)
- FRAV is concerned with ADS performance in achieving an MRC
- Circumstances that require the ADS to achieve an MRC would seem to be requirements.

“Minimal risk maneuver” means a procedure automatically performed by the automated driving system to place the vehicle in a minimal risk condition in a manner that avoids unreasonable risks in traffic.

- The MRC definition would cover avoiding risks in traffic.
- The ADS is ‘automatic’ so “automatically” redundant

“Minimal risk maneuver” means a procedure performed by the ADS to achieve a Minimal Risk Condition.

- Received comments on FRAV-09-05 and the request for comments on the 40 safety topics (FRAV-09-08)
- Reference documents
 - FRAV-09-06 (SAE)
 - FRAV-09-07 (Japan)
 - FRAV-10-06 (Japan)
 - FRAV-10-07 (Germany)
 - FRAV-10-08 (China)

- Thoughts on best way forward?
- Methods to gather input
- Frequency of meetings
- Questions that need to be answered
- Path from “safety topics” to performance specifications
- Next session