Should ODD be defined as <u>external</u> operating conditions under which an ADS feature is specifically designed to function?

The definition of ODD as referring to external vehicle conditions appears consistent with the general usage of the term and with taxonomies developed by standards agencies. Industry believes the ODD taxonomy is a critical element enabling meaningful high-level performance requirements that can be objectively applied across the diverse configurations of ADS and features. These elements should be defined in terms compatible with the performance requirements established by FRAV (parameters should be consistent between performance limits and ODD element definitions).

Industry recognizes that an ADS feature may have additional (non-external) design constraints that the manufacturer may wish to communicate to the safety authority. Given that the "ODD chapter" specifies information to be contained in a manufacturer description of the ADS feature, it may be useful to revise the scope of this chapter to cover requirements for manufacturer descriptions of an ADS and its features, including ODD and other key elements. A broader chapter covering "manufacturer descriptions" or "ADS design descriptions" might serve to capture ODD plus other information deemed essential to the understanding and assessment of a given ADS.

Please provide views on clarifying Document 5 with regard to "system safety", "system design", "operational performance", SOTIF, Functional Safety, "functions", "functional requirements", and "performance requirements".

Industry believes that the FRAV work would be simplified by a common understanding of terms and concepts, including those that may not necessarily be used in a formal (technical) text. The following provides our understanding of selected concepts.

"System Safety" ensures that the system satisfies functional and operational requirements to achieve minimum levels of safety, compliance with road traffic rules, and adherence to safe practices. The purpose of Document 5 is to establish requirements for system safety.

"Automated Driving System" (ADS) means the hardware and software that are collectively capable of performing on a sustained basis the entire dynamic driving task required by the feature(s) available to the vehicle user.

"ADS feature" refers to an application of ADS functions designed to operate within an ODD.

"ADS function" refers to a specific perception/control design capability that may be required by one or more ADS features to fulfill one or more functional and/or operational requirements based upon the feature ODD.

"Functional Requirements" address aspects of system safety related to the system design and the presence of requisite capabilities (such as driver monitoring, perception range).

"Operational Safety" ensures that the requisite capabilities, in the absence of fault, satisfy the functional requirements. SOTIF includes analysis of potential functional insufficiencies, functional modifications to reduce risk, analysis of reasonably foreseeable misuse, etc.

"Functional Safety" ensures the absence of unreasonable risks caused by foreseeable failure modes in the system's functional capabilities (E/E systems), e.g. through system-level redundancy, degradation strategies.

"Operational Requirements" focus on ADS feature behaviour, e.g., driving behavior, HMI, transfer of control, MRM. Operational requirements set minimum limits on the use and performance of an ADS feature.

Please provide views on whether FRAV should try this (or another) approach to considering safety requirements under Document 5.

Industry agrees that ODD/design descriptions, functional requirements, and operational performance requirements provide useful "baskets" for ensuring well-rounded coverage of system safety. FRAV has already agreed to take a "top-down" approach to setting requirements, recognizing that many, if not most, requirements will need to be high-level to cover the diversity of ADS applications and driving environments. FRAV has agreed that ADS will need to be assessed based upon their intended uses and limitations (i.e., a feature limited to 60 km/h would not be tested at 130 km/h). In this regard, the establishment of high-level functional and operational requirements that can be applied according to the specifications of a given ADS feature seems to offer a logical and objective approach.

Industry agrees that FRAV should move as efficiently as possible from the work on high-level concepts and common terms and definitions to the development of specific provisions. This approach appears to offer a method for considering the 142 candidates for such provisions gathered during the 2nd FRAV session (plus any other proposals) in a way that addresses manufacturer descriptions of ADS and their features, requirements for ADS functions necessary to perform the DDT of the ADS features, and requirements for the operational performance of those features.