This document summarizes the outcomes of the exchange of information in response to FRAV-03-05-Add.3 (request for input on ODD elements).

Consensus Decisions

FRAV has concluded that functional performance requirements provide the basis for determining ODD description requirements. The ODD descriptions would not be limited to mandatory elements (i.e., manufacturers may wish to include additional information). However, mandatory elements that FRAV may wish to define should be derived from functional requirements that are relevant to ODD-related performance.

Therefore, FRAV has agreed to continue developing Document 5, defining ODD elements as indicated by functional requirements to be determined.

FRAV has agreed to add a new paragraph 4.3. to the ODD section:

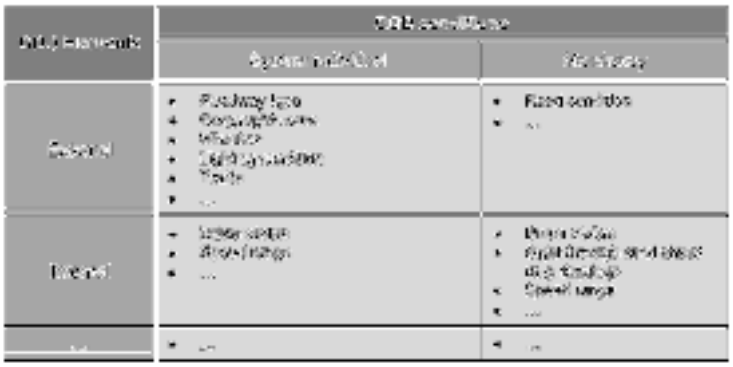
4.3. The purpose of an ODD description is to inform determinations on the requirements and scenarios applicable to an ADS feature.

The new paragraph indicates that ODD descriptions should be structured to enable the association of ODD elements with functional requirements. Based upon the ODD of an ADS feature, the manufacturer, safety authority, or other entity should be able to determine the requirements applicable to that feature.

In addition, the paragraph signals FRAV's view that scenarios developed by VMAD should be similarly consistent with the ODD descriptions. Based upon the ODD of an ADS feature, the manufacturer, safety authority, or other entity should be able to determine the scenarios applicable to that feature. The FRAV assumption is that the VMAD scenarios will play a role in determining the testing and other assessment methods to be applied to the ADS and its features.

The paragraph establishes relationships among functional requirements, assessment methods, ODD descriptions, and the scenario catalog. The ODD description informs decisions on what is to be tested (i.e., the requirements to be satisfied). At the same time, the ODD description informs decisions on the applicable scenarios. The selection of scenarios informs decisions on the assessments to be carried out. In this regard, the ODD description plays a role in a selection or "filtering" process to ensure that the appropriate methods are used to assess an ADS against the appropriate requirements.

The above consensus addresses Germany's input regarding mandatory and voluntary ODD description requirements. Germany provided the table shown here, suggesting that an ODD description would likely have required and voluntary elements. In this table, the "System individual" column refers to elements that a manufacturer may decide voluntarily to include in the description. The notion is that manufacturers may wish to identify items specific to a given ADS feature beyond the elements defined by FRAV. The "Mandatory" column would include elements that must be addressed in the ODD description for any ADS (for example, as the result of a functional requirement decided by FRAV or because VMAD decides they are necessary for the assessment process).



The consensus addresses OICA/CLEPA views that the ODD description provides a basis for deciding which requirements or assessment methods apply to an ADS.

Additional considerations

The following notes stakeholder input that FRAV may wish to consider in future discussions. In general, These positions/comments have been set aside for future consideration as FRAV develops functional requirements and other aspects of Document 5.

Some stakeholders supported using the SAE AVSC ODD Lexicon and PAS 1883 from the British Standards Institution which propose categorical ODD elements with further subcategories.

Japan suggested criteria for determining ODD elements:

- The user shall fully understand the description and use the system properly
- The testing authority shall assess regulatory conformity based on the description.

Japan also proposed that an ODD should be:

- Definable: possible to objectively describe
- Understandable: possible for the user to recognize
- Predictable: possible for the ADS to notice before exiting the ODD
- Comparable: possible to compare with different vehicle types, and
- Repeatable: possible to reproduce

SAFE proposed that:

- ODD elements should be measurable and verifiable,
- ODD descriptions should be hierarchical (i.e., present levels of abstraction from categorical to specific performance-relevant elements), and
- ODD descriptions should be combinable (i.e., descriptions can be merged to form a new description).

China suggested three different kinds of speed range. The first is the speed limit of the external environment, such as the speed limit of a road section, or the speed limitation created by the traffic jam. The second speed range is the speed range under which the ADS is designed to operate. The third speed range is one of the ADS's functions, that is what speed range the given ADS feature is capable to reach.

China suggests that only the external speed limit would fall under ODD. The speed range within which the ADS is designed to operate would be a different type of operational design condition. The speed range a given ADS is capable of would be a function of the ADS feature rather than a condition for its operation.

China reiterated its view that ODD refers to external conditions and leaves an open issue with regard to possible internal design conditions (e.g., dependence upon the user to perform safety-critical roles, speed range within which the ADS feature is designed to operate). SAE confirmed that "the status of a human driver is not part of the ODD" under J3016. China repeated its support for including the term "Operational Design Condition (ODC)" to mean the operating conditions under which an ADS feature is specifically designed to function where ODD would be a subset limited to external conditions.

SAE further noted the value of the levels of automation. A "feature's automation level provides a very succinct way of summarizing the design intent regarding the respective roles of the automation feature and the driver. However, the automation level is not an element of the ODD… As a result, identification of both the feature's ODD and its automation level (i.e., the respective roles of the ADS and a human driver) is essential to determining the requirements appropriate for a given feature and the capabilities the feature must have to perform safely within its ODD. (SAE J3016 refers to a particular level of driving automation within a particular ODD as a feature's 'usage specification'.)"

SAE also referred to the Dynamic Driving Task (DDT) as an important concept useful in defining requirements and assessment methods for Automated Driving Systems. The DDT refers to the functions (i.e., capabilities) required to operate a motor vehicle in traffic. The DDT does not refer to specific maneuvers (e.g., making a right or left turn). DDT expresses the capacities (such as control of vehicle motion, signaling/interacting with other road users, or detecting and responding appropriately to objects in the roadway) necessary to drive a vehicle (analogous to the competencies required for the licensing of human drivers).