

Transitions of Control: ADS Data Elements Illustration

FRAV/VMAD/EDR/DSSAD Complementarity

Transitions of Control: FRAV draft provisions (subject to change)

- An ADS which permits a transition of control shall be designed to ensure safe **transitions of control**. *(4.2.5.)*
- “Transition of control (TOC)” means a procedure by which the ADS engages the **fallback user** in dynamic control of the vehicle such that the fallback user assumes the role of **driver** upon completion. *(2.18)*
- “Fallback user” means a user designated to assume the role of driver upon completion of a transition of control. *(2.9.)*
- “Driver” means a qualified human being engaged in dynamic control of the vehicle. *(2.5.)*

Commonality of transition steps

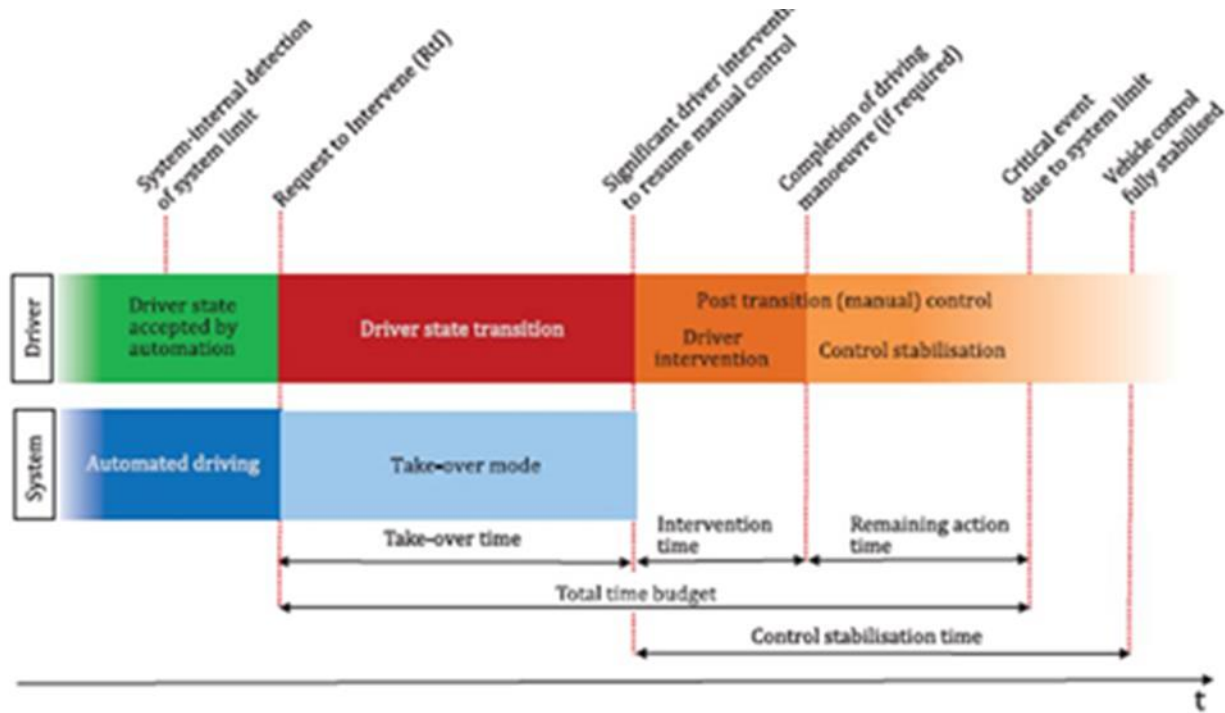


Figure 2 — System-initiated transition from automated to manual driving

The interaction shall follow a common sequence of actions and states in the transition of control (change of user roles)

Logically Derived TOC aspects

- TOC trigger (something initiates transition sequence)
 - User intervention
 - ODD exit
 - System fault
- } Only these triggers initiate a transition demand from the ADS.
- Transition demand issued if ADS initiated TOC
 - Evaluation of user inputs (verification of stable control)
 - TOC completed

Sequence Elements Raised in FRAV Discussions

- User intervention
- ODD exit condition
- DDT-critical fault
- Advance transition notifications
 - Delayed user response
- Transition demand
- User input verification
 - Inadequate or no user response
- Delayed response to user intervention due to safety condition
- TOC complete
- Fallback to minimal risk condition

Data Elements Considerations

- TOC only applicable to ADS designed for use with a fallback users.
- TOC involve identifiable steps or elements, but TOC sequences differ depending upon conditions and user responses.
 - User or ADS initiated
 - Advance notifications
 - Adequate or inadequate user inputs
 - TOC may be unsuccessful requiring fallback to MRC
- Objectives and use of data differ between EDR and ISMR
 - EDR for crash analysis by safety authority (e.g., specific elements of TOC sequence relevant to causation chain).
 - ISMR involves manufacturer reporting of performance metrics (e.g., frequency of unsuccessful TOC).
- Nonetheless, data elements may be identical for EDR and ISMR

Complementarity Across Informal Groups

- EDR/DSSAD can propose data elements.
- FRAV can propose safety specifications.
- VMAD can propose performance metrics.
- Each group can benefit from the views of the others.
- The critical need is to ensure consistency and alignment.
 - Terms and definitions
 - Data elements and requirements for ADS behaviors and actions
 - Data elements should enable reporting on performance metrics