

## DDT OPI proposals

The following proposals aim to resolve the remaining open items from the DDT section with the exception of 4.2.1

### Item 1 Nominal and Critical Scenarios

#### Original text

3.38.1 “Nominal scenario” means a traffic scenario representing usual and/or expected objects, object behaviours and/or road conditions.

3.38.2 “Critical scenario” means a traffic scenario representing unusual and/or unexpected objects, object behaviours, and/or road conditions.

#### OPI Proposal

3.38.1 “Nominal scenario” means any traffic scenario **that is not a critical or failure scenario**.

3.38.2 “Critical scenario” means a traffic scenario **where the operating conditions or behaviour of other road users requires a prompt action of the ADS to avoid or mitigate a collision with adverse consequences on human health or property damage**

#### Justification

Proposal developed in the DDT group to make the distinction between nominal and critical based on whether the ADS needs to take action to avoid a collision rather than the “unusual” nature of the scenario.

The wording was chosen to ensure all scenarios fall into one of the three categories

Interpretation document can clarify with some examples if appropriate.

Definitions should be reviewed when we have a final document to ensure consistency.

### Item 2 “aim to” provisions.

#### Original text

5.2.1.3 The ADS shall [aim to] avoid unreasonable disruption to the flow of traffic in line with safety risks.

5.2.1.7. The ADS shall [aim to] not force other road users to take evasive action to avoid a collision with the ADS vehicle.

5.2.1.11. The ADS shall [aim to] avoid collisions with safety-relevant objects.

#### OPI proposals

5.2.1.3 The ADS shall ~~[aim to]~~ avoid unreasonable disruption to the flow of traffic in line with safety risks.

5.2.1.7. *The ADS shall ~~aim to~~ not force other road users to take evasive action to avoid a collision with the ADS vehicle.*

5.2.1.11. *The ADS shall ~~aim to~~ avoid collisions with safety-relevant objects.*

### **Justification**

With the above definition of critical scenario, the flexibility of “aim to” is not required in nominal scenarios.

All requirements should be reviewed when section is finalised to ensure they work with the nominal and critical scenario definitions

## Item 3 Scenarios vs Situations

The document is inconsistent when using the terms “scenarios” vs “situations”

Given the definition of “*Traffic scenario*” is “a description of a sequence of driving situations that may occur during a given trip”, the DDT group agreed that the terms are used interchangeably, it was acknowledged this may differ from the dictionary definition.

### **OPI Proposal**

Use “scenario” throughout the document rather than situation whenever referring to a driving situation.

Review document for terms to change

## Item 4 ADS States

The regulation should use uniform language to refer to activation and deactivation.

### **OPI proposal**

- ADS Feature active
- ADS Feature inactive
- The ADS Feature is “active” following the Activation process until the end of either a system-initiated deactivation or a user-initiated deactivation process. Whilst active the ADS Feature performs the DDT

### **Justification**

The document only refers to whether a feature is active or inactive. There are no uses of the ADS (as distinct from its features) being deactivated. The document should be checked for consistency.

## Item 5 Failure of fallback user to respond

### **Current text**

5.2.5.3. *If the ADS feature is designed to request and enable intervention by a fallback user, the ADS shall execute a fallback to an MRC in the event of a failure in the transition of control to the user.*

#### **OPI proposal**

5.2.5.3. ***For type 1 ADS features\****, the ADS shall execute a fallback to an MRC in the event of a failure ***of the fallback user to assume control of the DDT following an attempted system-initiated deactivation.***

\*If definition for type 1 and 2 ADS features not accepted replace with “If the ADS feature is designed to request and enable intervention by a fallback user”

#### **Justification**

The above requirement still uses the term “transition of control” which is not used elsewhere in the document anymore.

***Future item: should a failure in the fallback user monitoring also result in a MRC?***

## **Item 6 Avoiding Critical scenarios**

#### **Integration document text**

*Under nominal scenarios, an ADS is expected to demonstrate behavioural competencies consistent with the requirements for DDT performance. For example, one of those competencies would be the ability to minimise risks of getting into critical situations through the exercise of competent and careful driving.*

We have no corresponding requirement in the ADS reg.

#### **OPI proposal**

##### ***Option 1 New requirement***

***New requirement: The ADS shall aim to avoid getting into critical scenarios***

##### **Option 2 Amend existing requirement**

5.2.1.4 *"The ADS shall adapt its driving behaviour ~~in line with~~ to **reduce** safety risks.*

##### **Option 3 Use relevant requirement from R157**

***New requirement: The ADS shall demonstrate anticipatory behaviour in interactions with other road users, in order to ensure stable, low-dynamic, longitudinal behaviour and risk minimising behaviour when critical scenarios could become imminent e.g. with pedestrians or cutting-in vehicles.***

#### **Justification**

There was general agreement from contracting parties that something along these lines was necessary. There was discussion that this may already be covered (particularly by 5.2.1.4) but it was felt it was beneficial to have an explicit requirement to point to. There was also concern that referencing critical scenarios in a requirement may be undesirable.

## Item 7 Road Safety Agents

Currently there is a definition of road safety agent but at some point any associated requirement was lost. In the 3<sup>rd</sup> ADS IWG meeting DDT OPI was tasked with determining if the definition was appropriate and whether corresponding requirements were needed.

### OPI proposal

#### **Option 1 Retain original definition**

*“Road-safety agent” means a human being engaged in directing traffic enforcing traffic laws, maintaining/constructing roadways, and/or responding to traffic incidents.*

#### **Option 2 Amend definition to make it more specific**

*“Road-safety agent” means a human being engaged in directing traffic **in accordance with national or regional law.** ~~enforcing traffic laws, maintaining/constructing roadways, and/or responding to traffic incidents.~~*

#### **Part 2 Add a new requirement to the nominal section**

***New requirement: The ADS shall have strategies in place to appropriately detect and respond to instructions from road safety agents.***

#### **Part 3 Add an additional sub requirement to the critical scenario section for post collision behaviour**

*5.2.2.2 In the event of a collision involving the ADS vehicle, if required to stop by applicable law, the ADS shall fall back an MRC.*

*5.2.2.2.1 The ADS shall not resume travel until:*

- a) The safe operational state of the ADS vehicle has been verified, and*
- b) It is permissible under the applicable law.*

***5.2.2.2.2 Notwithstanding 5.2.2.2.1 the ADS [may/shall] move the vehicle if this is required in order to appropriately respond to a road safety agent***

### Justification

The key interaction with road safety agents is that they may direct the ADS to do some action, as such the other parts of the definition may be unnecessary.

The wording of the proposal was chosen to allow the manufacturer to justify in their safety case what the appropriate response would be in a technology neutral manner. This wording should

include the intervention of a remote operator if the manufacturer chose without bringing requirements on remote operation into the regulation at this stage.

In 5.2.2.2.2 The language was chosen to allow road safety agents to clear the way if for example the MRC of the ADS was blocking emergency services but is kept high level to allow for the manufacturer's preferred strategy to handle the situation. Decision needed on whether may/shall is preferable for 5.2.2.2.2

The interpretation document will need to make these points clear.

## Future items

- Use of "Careful and Competent" in the general requirements
- Consider if the application of nominal requirements to critical scenarios text is appropriate and works for a regulation.
- Proposal to add requirement that the ADS should detect if it has no passengers
- Consider if the fallback response definition is appropriate