DDT proposals for Open items

Additions to ADS-04-04 highlighted in yellow

1. Operating at Safe Speeds

Current text

5.2.1.1. The ADS shall operate the vehicle at safe speeds.

Proposed text

*5.2.1.1. The ADS shall ~~operate the vehicle at safe speeds~~ **adapt its speed in line with safety risks***

Justification

This avoids defining "safe speeds" by making the requirement more ADS focused, moving the ambiguity from what safe speeds are to instead be how the ADS adapts its speed. The manufacturer then is justifying why the speeds chosen are appropriate for the current road conditions.

This wording is also consistent with another requirement "The ADS shall adapt its behaviour in line with safety risks". This forms a pair requiring the behaviour and speed to both be adapted.

This also aims to avoid Canada's concerns from the Brussels meeting that in attempting to define safe speeds we should not be trying to create new traffic rules.

2. ADS disrupting the flow of traffic

Current text

5.2.1.3.   The ADS shall adapt its driving behaviour to the surrounding traffic conditions in order to avoid disruption to the flow of traffic;

Proposed text

*5.2.1.3. The ADS shall [**aim** to] avoid **unreasonable** disruption to the flow of traffic ~~by adapting its behaviour to the surrounding traffic~~ **in line with safety risks**.*

Justification

Decision required on whether it should include "Aim to"
This wording covers cases where traffic may be disrupted beyond the ADS' control.

If aim to language used then DCAS text should be included
(a)   Some requirements are expected to be always met, including in all relevant tests. These provisions are phrased as "the system shall…";
(b)   Some requirements are such that whilst the system is generally expected to fulfil them, this might not always be appropriate or achievable under the specific circumstances, or

==external disturbances may still lead to a varying output. These provisions are phrased as "the system shall be aim to…"==

3. Presence of a fault

The following requirements use inconsistent language and are potentially redundant.

Current text

5.2.3.3. The ADS shall execute a fallback response in the event of a failure in the ADS and/or other vehicle system that prevents the ADS from performing the DDT

5.2.3.4 The ADS may continue to operate in the presence of faults that do not prevent that the ADS from fulfilling the safety requirements applicable to the ADS;

> *5.2.3.4.1 In response to a fault, the ADS may permit activation and use of a feature impacted by the fault provided that the ADS continues to provide the functions necessary to perform the entire DDT;*

> *5.2.3.4.2 The ADS shall adapt its performance of the DDT in accordance with the severity of the fault to ensure road safety;*

> *5.2.3.4.3 The limited operation of the ADS shall comply with the normally applicable safety requirements;*

> *5.2.3.4.4 The ADS shall prohibit activation of an ADS feature in the presence of a fault in an ADS function that compromises the ADS capability to perform the entire DDT within the ODD of the feature;*

Proposed text

5.2.3.3. The ADS shall execute a fallback response and prohibit activation in the presence of a fault in the ADS and/or other vehicle system that prevents the ADS from meeting the requirements of this section [5.2].

5.2.3.4 In response to a fault, the ADS may continue and adapt its performance of the DDT, in accordance with the severity of any fault provided this resulting performance complies with the requirements of this section [5.2].

Justification

The previous text just covered deactivate and don't reactivate if the fault prevents the performance of the DDT. Section 5.2 covers the requirements to perform the DDT, care must be taken when new requirements are added to 5.2 to check this still applies, however since those requirements refer to safe performance of the DDT this should not be in issue.

4. Remote termination

Current text

5.2.3.5. Remote termination of individual or multiple ADS or feature(s) by the manufacturer and/or service operator shall be possible when requested by Authorities.

5.2.3.5.1. Remote termination for an ADS performing the DDT shall ~~be capable of~~ trigger~~ing~~ an ADS fallback response.

*5.2.3.5.2. Remote termination of an ADS or ADS feature(s) shall render ~~them~~ **it** unable to be activated by **a** user.*

Proposed text

Add a definition of remote termination to avoid confusion as to what 5.2.3.5 is referring to.

"Remote termination" rendering one or multiple ADS or ADS features unable to be activated by the user.

Or

"Remote termination" means the act of disabling one or more ADS features of one or more vehicles.

5.2.3.5. Remote termination ~~of individual or multiple ADS or features~~ by the manufacturer and/or [service operator] shall be possible when requested by Authorities.

5.2.3.5.1. Remote termination for an ADS performing the DDT shall be capable of triggering an ADS fallback response.

*5.2.3.5.2. Remote termination of an ADS or ADS feature(s) shall render it unable to be activated by **a** user **until such time as the remote termination is rescinded.***

Justification

New definition avoids confusion as to what remote termination is (two options). Revert 5.2.3.5.1 back to integrated document text (avoids issues from low connectivity and implication that a fallback response is mandatory). Also added text so remote termination is not necessarily forever, this is added to the requirement.

Repetition of individual or multiple unnecessary given its in definition.

Discussion/ definition required on service operator – for the case when the manufacturer does not have an active role in running the ADS.

5**. Collision requirements**

Current text

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

5.2.1.8 The driving behaviour of the ADS shall not cause a collision.

5.2.1.11 The ADS shall avoid collisions with safety-relevant objects where possible.

5.2.2.2. In the event of a collision, the ADS shall stop the vehicle in an MRC and/or in accordance with applicable traffic laws.

5.2.2.2.1.   The ADS shall not resume travel until:
  a)   the safe operational state of the ADS vehicle has been verified,
  b)   it is permissible under the applicable law / traffic rule(s),
  c)   there are no other safety considerations.

Proposed text

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

5.2.1.8 The driving behaviour of the ADS shall not cause a collision.

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

*5.2.2.2 In the event of collision **involving the ADS vehicle, if required [to stop] by applicable traffic rules** the ADS shall stop the vehicle in an MRC and/or in accordance with applicable traffic laws.*

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 / traffic rule(s),
c)   there are no other safety considerations.

Justification

Deleting 5.2.1.8 as determining cause is very difficult and we already have a requirement to avoid collisions (5.2.1.11) so 5.2.1.8 introduces unnecessary confusion.

Decision need on "Aim to" language, it is consistent with DCAS when talking about things that may be out of the ADS' control. "Aim to" also makes "where possible" language unnecessary, however these are nominal requirements so the ADS should never collide and "aim to" may be unnecessary.

5.2.2.2 Reordered to make it clearer specifically what is being asked of the ADS and remove confusing "and/or". Clarified the collision must involve the ADS to cover Germany comment. <mark>The traffic law will require the vehicle to stop not specifically a MRC.</mark>

5.2.2.2.1 Removed ambiguous "other safety considerations" (if we have anything specific in mind they could be added). Applicable law covers traffic rules. <mark>Added "and" as both requirements should be met</mark>. <mark>Further discussion needed on whether a fallback response would also be acceptable.</mark>

6. Nominal and Critical definitions

Current text

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

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

Proposal
<mark>More discussion required, leave for South Korea but moving towards a risk based distinction not probability</mark>

Nominal Scenario means a traffic scenario in which the behaviour of other road users is in line with traffic rules and the operating conditions are free from immediate safety risks, where no failures occur that are relevant to the ADS's performance of the DDT

Critical Scenario means any traffic scenario that is not a nominal or failure scenario

Justification

This changes the distinction between nominal and critical scenarios to be based on risk rather than probability. The reference to whether the scenario is usual or unusual is removed and replaced with whether other road users are following traffic rules or there is an immediate safety risk. By referencing nominal and failure scenarios in the critical definition we ensure there are no overlap and no scenarios that do not fall into a category.

In practice this means that there will be many critical scenarios in the real world with Nominal scenarios being about assessing the overall ADS ability to perform the DDT (e.g. lane keeping, navigating through traffic, …). More complex scenarios in the real world are likely to be critical but the DDT requirements as written would continue to apply in those cases as far as reasonably practicable with the aim of minimising overall risk.

7. ODD Framework

<u>Current text</u>
The manufacturer shall use a process to derive behavioural competencies and scenarios that are ODD-relevant. The methodology used in Annex [x] can be used or alternative methods providing they are equally comprehensive.

<u>Proposal</u>

Leave this text unchanged

<u>Justification</u>

Whilst the text in the ODD framework annex is the only method FRAV discussed it was in the context of an optional framework to provide guidance. Other methods may be acceptable but it would just be harder to justify in the safety case. Future work should expand on this

8. ADS signal

<u>Current text</u>

5.2.1.13.   The ADS shall signal its operational status if required by national rules.

<u>Proposed text</u>

*5.2.1.13.   The ADS shall signal its operational status if required by national **laws** ~~rules~~.*

<u>Justification</u>

Editorial change as in this case the requirement of an ADS operational status signal would be in a national law rather than a rule.

9. Items for next phase

Road safety agents
Nominal and Critical scenario definitions
Careful and competent human driver
German proposal for new requirement around adjusting performance of the DDT if the vehicle is unoccupied.