VMAD

Subgroup 2b: Test track- / Real world testing

VMAD Webex meeting 9 September 2020

SG 2b paper: background….

- High level overview key concepts / issues track / real world testing NATM

- Expanded with feedback 9th VMAD and SG 2b meeting 18 August

- A lot of common viewpoints after SG discussions

- Still some diverging viewpoints / questions to VMAD:

    - In document; overview end of this presentation

    - Also input for further steps to be taken….

    - As described also at the end of presentation (workplan)

FULL AUTO BRAKE

VMAD Webex meeting,
9 September 2020

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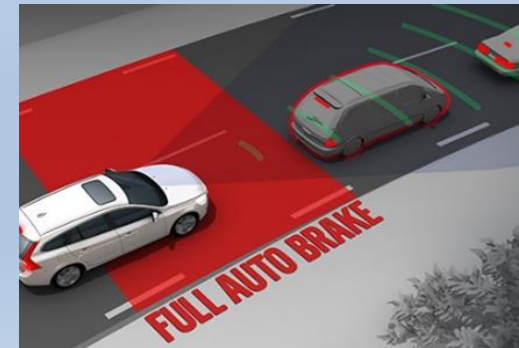
High level overview: Track testing (1)

- Track testing: defined

    - Access testing ground with relevant physical elements

    - Assessing capabilities / functional safety requirements ADS

        - Track testing may (also) be used to test human factors

- Methodology techniques

    - Physical vehicles / specific scenarios

    - Control over many elements ODD

- Strengths / weaknesses

    - Strengths: Controllability, repeatability, etc.

    - Weaknesses: Significant time for set up / execution, costly, etc.

- Why include Pillar in NATM?

    - Higher level of environmental fidelity

    - Control over many of test elements

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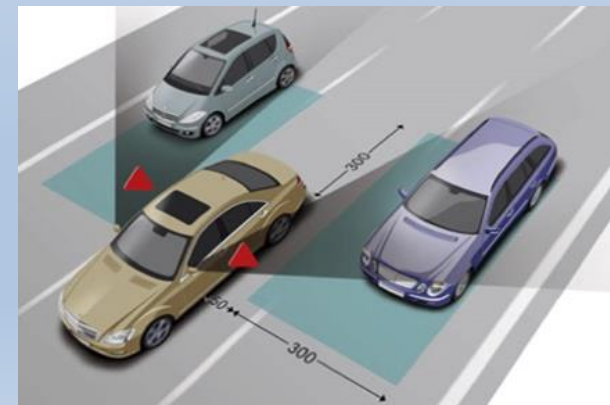
High level overview: Track testing (2)

- Maturity….?

   - Track testing is mature….

   - however; testing vehicles with ADS is fairly new….need for further refinements

- Interaction with other pillars

   - Exposure to rare events or safety critical scenarios….scenarios SG 1a

   - To validate simulation test….. Question to VMAD
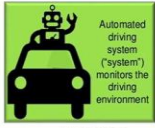

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Track testing: next steps (Workplan)

- Identification best practices / existing procedures track testing

- Identification tools / resources that still need to be developed

- Identification (with SG 1a) of scenarios / scenario elements, including how to measure

- Outline / description methods / procedures for track testing of ADS's safety requirements

- Identification data / information produced in order to provide an objective assessment

- How to use track testing to validate functional safety requirements established by FRAV.


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High level overview: Real World testing (1)

- Real world testing: defined

  - Uses public roads to test capability and safety (e.g. human factors, safety system) requirements ADS or

  - of a vehicle with an ADS in real world traffic scenarios

- Methodology techniques

  - Use of public roads to test compliance with safety requirements

  - Exposure to real world conditions

  - All encountered traffic scenarios to be included in the assessment

- Strengths / weaknesses

  - Testing of scenarios that are not possible on test track (rain, tunnels, etc.)

  - High environmental validity (vehicle in intended ODD)

- Why include pillar in NATM?

  - RWT assesses safe behaviour of ADS in its true operating environment

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High level overview: Real world testing (2)

- Maturity….?

    - RWT is in use for assessing performance human drivers;

    - For testing ADS new challenges; draw in experiences from other (vehicle related real world testing schemes)

- Interaction with other pillars

    - Identification new traffic scenarios for track testing and simulation

    - Validation of (portions) of virtual- and test track testing…..? (Question to VMAD)
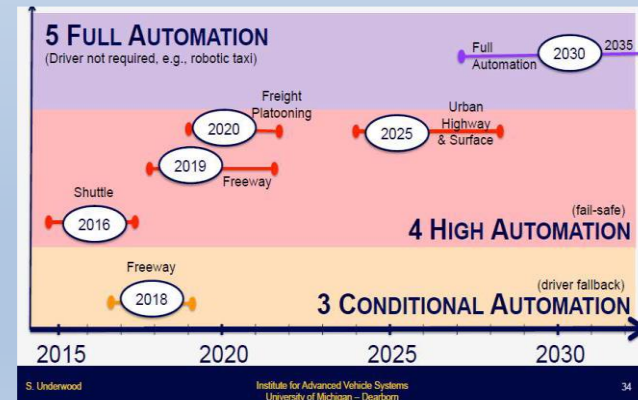
Source: University of Michigan

Real world testing: next steps (Workplan)

Outstanding questions prior to developing specific real world test for validation ADS…

- The group considers the scope of real world testing in the context of its work to be for the purposes of safety assessment / certification

  - RWT during the development phase in the audit pillar? (Question to VMAD)

- Identification of best practices / procedures currently existing regarding RWT

- Identify (with SG 1a) scenario elements of an ODD that can be reliably reproduced in RWT procedure

- Outline / description various methods / procedures RWT

- Set definitions for several items to assess the ADS items

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Open questions to VMAD

- Verification / Validation simulation tests during test and/ or real world tests? Or part of assignment SG 2a or otherwise….? View SG 2b: Should not be our assignment….

- Development of new traffic scenarios: responsibility SG 2b / SG 1a or both?

- Real world testing during development phase in the audit pillar?

    - The use of "shadow modes" while developing?

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