



Rijkswaterstaat
Ministry of Infrastructure and the
Environment

automated driving

human behaviour

Human Behaviour round table
6 November 2015

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Ambitie automatisch rijden





Werkgroep ZRA

- I&M
- RWS
- RDW

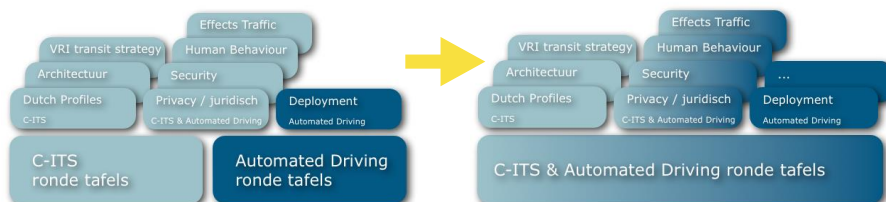
1. Regelgeving
2. Faciliteren grootschalige testen op de openbare weg
3. Nederland als koploper
4. Kennisontwikkeling

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Round tables



- Aantal bestaande C-ITS ronde tafels kent grote overlap met kennisdomeinen
- samenvoegen tot gezamenlijke ronde tafels
- komend half jaar aansluiten bij geplande bijeenkomsten
- aanvullend enkele specifieke automated driving bijeenkomsten plannen
- in december evalueren of deze structuur bevalt en formaliseren

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Ontheffingsprocedure



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Voorzitterschap EU in 2016

Put smart mobility on the agenda

- Declaration
- Experience
- EU-TPC



Informal Transport meeting, Amsterdam, April 14-15

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EU Truck Platooning Challenge

A fresh perspective on mobility and logistics

European Truck Platooning
Challenge 2016



www.eutruckplatooning.com <https://www.youtube.com/watch?v=WLVoc1d-Kks>

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Truck platooning en HF

Rol chauffeur

- Transition of control
- Andere invulling rol (shift naar monitoring)
- Loss of skills
- Relatie rust en rijtijden
- ...

Interactie verkeer

- Hoe reageert verkeer bij op en afritten?
- Impact op lane changes? Meer of minder inhalen?
- ...

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SAE Level	Name	Narrative Definition	Execution of Steering/ Acceleration/ Deceleration	Monitoring of Driving Environment	Fallback Performance of Dynamic Driving Task	System Capability (Driving Modes)
<i>Human driver monitors the driving environment</i>						
0	No Automation	the full-time performance by the <i>human driver</i> of all aspects of the <i>dynamic driving task</i> , even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	Driver Assistance	the <i>driving mode</i> -specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	Human driver and system	Human driver	Human driver	Some driving modes
2	Partial Automation	the <i>driving mode</i> -specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	System	Human driver	Human driver	Some driving modes
<i>Automated driving system ("system") monitors the driving environment</i>						
3	Conditional Automation	the <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> with the expectation that the <i>human driver</i> will respond appropriately to a <i>request to intervene</i>	System	System	Human driver	Some driving modes
4	High Automation	the <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> , even if a <i>human driver</i> does not respond appropriately to a <i>request to intervene</i>	System	System	System	Some driving modes
5	Full Automation	the full-time performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> under all roadway and environmental conditions that can be managed by a <i>human driver</i>	System	System	System	All driving modes

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NHTSA Automation Level	System Status	Technology Function	"Driver" Attention Required		
			Brain on	Eyes on	Hands on
Level 0: Non-automation	Always on	Warning	Brain on	Eyes on	Hands on
Level 1: Function-specific Automation	Always on	Brief Emergency Control	Brain on	Eyes on	Hands on
Level 2: Combined Function Automation	Driver activated	Co-pilot	Brain on	Eyes on	Hands off
Level 3: Limited Self-Driving Automation	Driver activated	Situational Auto-pilot	Brain on	Eyes off	Hands off
Level 4: Full Self-Driving Automation	Driver activated or always on	Full Auto-pilot	Brain off	Eyes off	Hands off



Overige projecten

EU

- Chauffeur 1 and 2
- Sartre
- Companion
- Adaptive
- iGame (28-31 mei 2016, scenario met platoon merging, www.gcdc.net)
- TNO/DAF EcoTwin

VS

- Auburn
- Los Angeles



Rol chauffeur

Transition of control

- Literature study (available end of this month)
- Simulator study by TNO (available end of this year)
- Video experiment by SWOV (available end of this year)
- ...

Relatie rust en rijtijden

- Politiek gevoelig
- Afhankelijk van levels of automation
- ...



Interactie verkeer

Hoe reageert verkeer bij op en afritten?

- Afhankelijk van diverse factoren
 - Omvang platoon (2, 3, meer)
 - Volgafstand (kleiner, gelijk of groter dan nu?)
 - Herkenbaarheid, relevant?
 - ...

Impact op lane changes? Meer of minder inhalen?

- Leidt platoenen tot minder inhaalmanoeuvres van vrachtwagens?
- Wordt het lastiger om platoons in te halen?



Discussie

Scenario's ter hoogte van op of afrit (en weefvakken?)

- Platoon gewoon door laten rijden
 - Wel overig verkeer informeren (drip, incar?)
 - Koppeling TDI?
- Platoon tijdelijk opbreken of volgafstanden groter maken
 - Bij welke omvang platoon?
 - Bij platoons groter dan 3, tussen all vrachtwagens grotere gap of alleen bij 1. Zichtbaar maken voor in/uitvoegend verkeer?
- Volgafstand (kleiner, gelijk of groter dan nu?)
 - Is er een optimale volgafstand, geredeneerd vanuit overig verkeer?
- Herkenbaarheid, relevant?
 - Moet ook zichtbaar zijn of truck actief is of niet? Mate van ook?
 - Verandert gedrag overig verkeer?



Discussie

Impact op lane changes? Meer of minder inhalen?

- Leidt platoonen tot minder inhaalmanoeuvres van vrachtwagens?
- Wordt het lastiger om platoons in te halen?

Acceptatie

- Chauffeurs bang om baan te verliezen?
- Aantrekkelijkheid

Overige punten?



Thank you for your attention



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Misuse of automated features

- Filmpjes

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