



Meaningful Human Control – 4 years later

Daniël Heikoop

Centraal Bureau Rijvaardigheidsbewijzen (NL)



July 2022

[Home](#) > [Press corner](#) > [New Vehicle General Safety Regulation](#)



Available languages: English ▾

[Press release](#) | [6 July 2022](#) | [Brussels](#)

New rules to improve road safety and enable fully driverless vehicles in the EU

[Page contents](#)

[Top](#)

[Print friendly pdf](#)

[Contacts for media](#)

The new [Vehicle General Safety Regulation](#) starts applying today. It introduces a range of mandatory advanced driver assistant systems to improve road safety and establishes the legal framework for the approval of automated and fully driverless vehicles in the EU. The new safety measures will help to better protect passengers, pedestrians and cyclists across the EU, expectedly saving over 25,000 lives and avoid at least 140,000 serious injuries by 2038.



List of Mandatory ADAS as of July 2022

- Cruise Control (CC)
- Adaptive Cruise Control (ACC)
- Traffic Sign Recognition (TSR)
- Intelligent Speed Assistance (ISA)
- Lane support
- Blind Spot Warning (BSW)
- Navigation systems
- Surround cameras
- Parking sensors
- Assistent Parking

Benefits and concerns

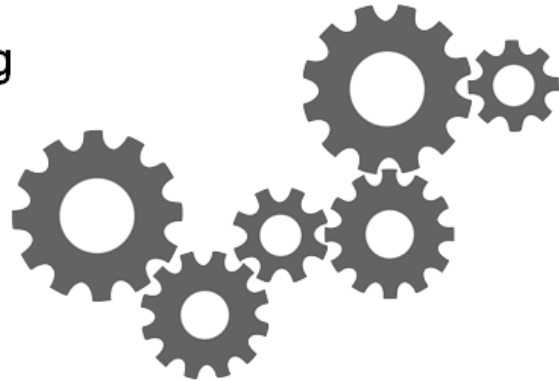
- Increased safety
- Increased fuel economy
- Increased traffic flow
- Reduced traffic jams
- Decreased awareness
- Monitoring fatigue
- Complacency
- No meaningful human control



Meaningful Human Control

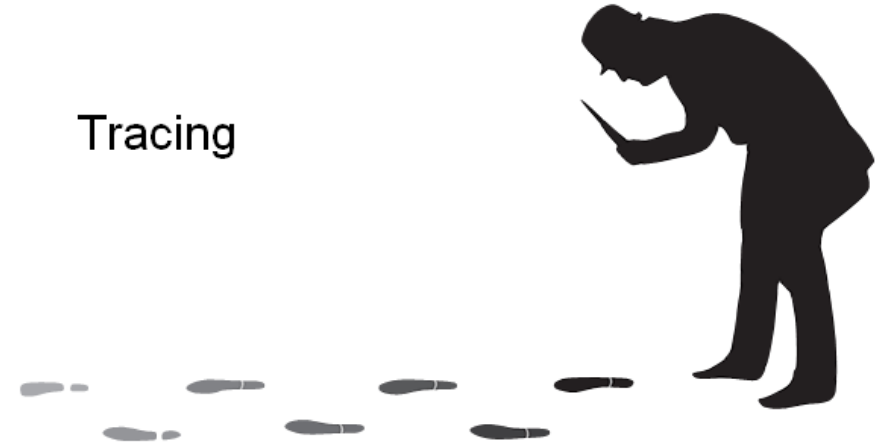
- *Trackability and Traceability*

Tracking



The system (human operators, operated devices, infrastructures...) should be able to co-vary its behavior with the relevant reasons of the relevant human agent(s) for carrying out X or omitting X

Tracing



There is at least one human agent in the system design history or use context who can appreciate the capabilities of the system and her own role as target of potential moral consequences for the system's behaviour



4 years earlier – September 2018

- Focus group study @ Utrecht, The Netherlands
- 11 CBR driving examiners
- Semi-structured interview (minimally required)
- “What transition of control would allow for MHC?”
- “What would/should be the main dimension of such a transition?”
- 4 topics of consensus
- 2 of debate

The topics of consensus

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system



The topics of discussion

	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training



4 years later – february 2022

- Focus group study @ Deventer, The Netherlands
- 14 CBR driving examiners
- 4 ADAS equipped cars
- 2 half hour sessions
- Collective feedback
- Focus group on 7 points

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Results from 2022

- 4 out of 5 consensual findings

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Appeal
Functionality!
Safety!

Human Factors!

-> Knowledge of fallibility
-> 'blind update' safety concern
-> let youngster have monitoring as part of driver training

Results from 2022

- In-depth discussion of the 7 topics

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Roughly still flawed

Dealers to training (high segment)

- No time
- RTFM
- Online search (update!)
- Today yes, next week no
 - 'blind update'
 - Automated overtaking

Consumer own responsibility... how!?

Manufacturer

Faults leading -> producer

RDW no software -> Human Factors



Results from 2022

- In-depth discussion of the 7 topics

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Whether it can or cannot do things
 Whether it just is
 Awareness of being assistive
 Uniformity
 Goal



Results from 2022

- In-depth discussion of the 7 topics

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Definite yes!
 Inform about?
Infallible
 Expectancy -> manner reactive
 Handle function
 Also *positive*



Results from 2022

- In-depth discussion of the 7 topics

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Different levels of drivers
Youngster better if taught <- do now?

Results from 2022

- In-depth discussion of the 7 topics

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

Not realistic, although interesting
 -> worth investigating
 Dependent on technology
 -> acceptance
 Accessibility

Results from 2022

- In-depth discussion of the 7 topics

TABLE I. MAIN FINDINGS OF FOCUS GROUP DISCUSSION

	Main findings in short
	Consensual findings
#1a	Current ADAS market introduction is flawed
#1b	Understanding ADAS' functionality is key
#2	ADAS should be intuitive, easy, and fun
#3	Automation surprise is a serious safety issue
#4	Do not aim for having drivers monitor their system
	Discussion points
#1	Levels of automation to have human-oriented focus
#2	The form of ADAS driver training

No RTFM

Driving education

Guidelines

Theory basis -> practical ...?



Conclusion: clearer views & no solutions

- Practical experience (on-day & over the years) lead to clearer views and in-depth discussion
- Many concerns still unresolved
- Raises flags:
 - Are we advancing?
 - Is safety (i.e., the human driver) being ignored/overlooked?
 - What is/will be next?
- Signs of concerns reaching common ground
- Rich discussion leading to professional suggestions of safe implementation and usage



Questions?

