Rijkswaterstaat
Ministry of Infrastructure and the Environment

Smart driving, smart working

The added value of real world experience with partially automated vehicles

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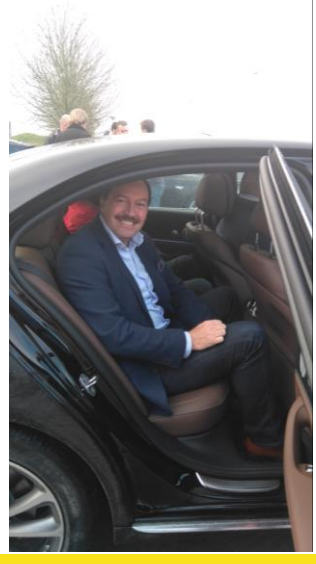
Content

- Goal of the driving experience/course
- Design of the experiments/course
- General findings, more detailed results in following sessions!



Goal of the course "Smart Driving, Smart Working"

- Offer colleagues of Rijkswaterstaat (and other Road Authorities) state of the art knowledge on Smart Mobility, AD and specifically ADAS, increase their awareness of the potential impact to their work
- Our opinion that this will improve how they can do their work now and in the future
- Providing real life experience with ADAS: More impact in stead of only reading about it.
- Learn from the participants by researching their experience (learning by doing).

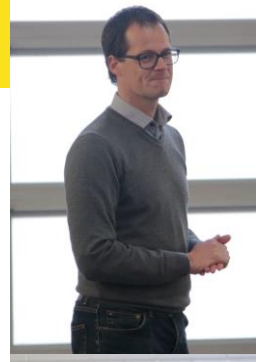
Overview of the course day

09.00-10.15	Plenary session for knowledge transfer
10.15-11.45	Block 1 Driving Experience Group A+B drive, Group C focus group and demos
11.45-12.30	Lunch
12.30-14.00	Block 2 Driving Experience Group A+C drive, Group B focus group and demos
14.00-15.30	Block 3 Driving Experience Group B+C drive, Group A focus group and demos
15.30-16.00	ACC demo
16.00-17.00	Plenary closing session & survey

Knowledge transfer

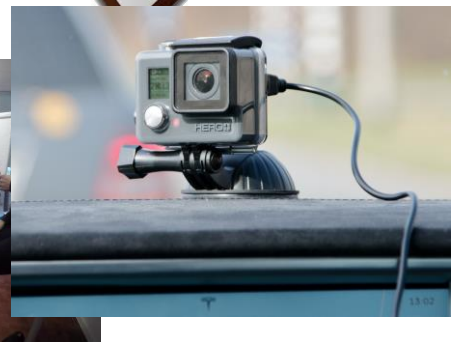
Presentations & Discussions by:

- Rijkswaterstaat-WVL
  - Overview national/international developments
  - Pilots in the Netherlands through the years
  - European agenda and "Declaration of Amsterdam"
  - Knowledge agenda Automated Driving
- TU Delft
  - International developments, technical aspects & human behaviour
  - Levels of Automated Driving (SAE 1 t/m 5)
- ProDrive
  - Practical information on driving with available ADAS
  - Safety briefing and the role of instructors



Research Sources

- Surveys (before, during, after)*
- Log books in the cars**
- Video footage**
- Focus groups



* Results in next sessions
** TBD

Systems

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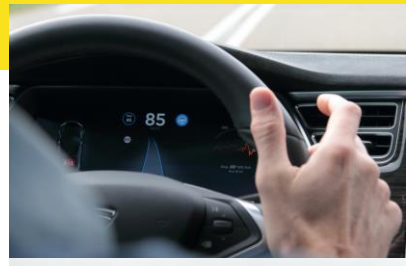
Tesla

- Tesla Model S
- Tesla Model X (Feb 3 and May 12)

- Autopilot version 1 (May 12 version 2)
  - Keeping distance and driving within the lane markings
  - Hands should be kept at the wheel) (otherwise warning and switched off)
  - Warning if the markings are not visible enough (and switched of afterwards)
  - Automatic lane changing
  - Automatic braking



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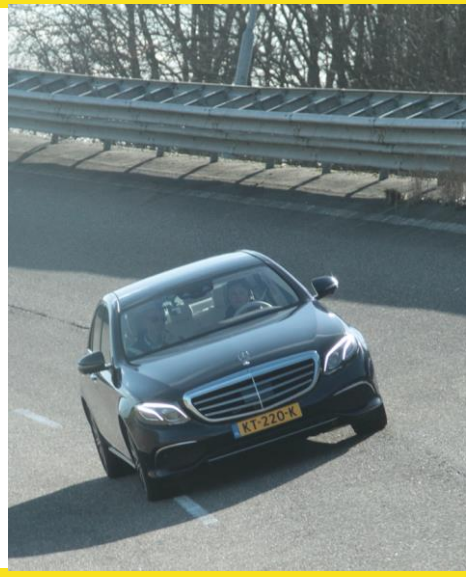
Mercedes

- E-Class

- Drive pilot
  - Between the markings (Steering pilot) + Keeping distance (Distronic)
  - Preventing driving too fast (Speed pilot)
  - Automatic lane changing
  - Automatic braking



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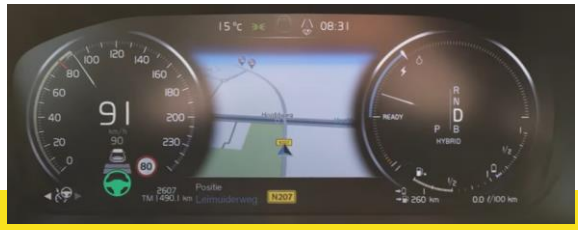
Volvo

- XC90, V90, S90

- Pilot Assist
  - Between markings (feedback adjustable) + keeping distance
  - Hands should be kept at the wheel (otherwise warning and switched off)
  - Visual warning if markings are not good enough (detectable)
  - Automatic braking



General results (1) Trips

- 5 days (Dec 2 2016, Feb 3, Mar 10 & 31, May 12 2017)
- 170 participants
- Every participant drove 2 times for appr. 20-25 minutes
- 317 trips (1 hr trip)
- 10920 kilometers driven
  - 53 % Highway (5820)
  - 36 % Provincial Roads (3930)
  - 11 % Urban Roads (1170)

General Results (2) Participants

	#	%
Men	121	73%
Women	45	27%
< 35 years old	37	22%
35-50 years old	69	42%
50+ years old	60	36%
Innovators/early adopters	38	23%
Early majority	69	43%
Late majority/Laggards	55	34%
No or hardly any experience	105	65%
A little or many experience	57	35%

General results (3) Expectations before (Foc. Gr.)

- Many questions upfront
  - What are the systems capable of? Differences per brand?
  - When do you have to intervene as a driver?
  - To what level does the car have the same "traffic" insight as a human driver?

- Positive expectations
  - Systems really support and make driving more comfortable
  - Systems are obviously well ingegrated and work well on highways

- Negative expectations
  - Systems are unreliable, operation of ADAS is difficult
  - Are systems switched off under circumstances that they don't work and am I aware as a driver?

General Results (4): After driving (Focusgroup)

Real life experience gives:

- Better insight in how the systems work, per brand (big) differences
- Better insight in the situations where the systems work and don't work.
- More nuanced view

- Positively surprised that systems are developed this far "Did not know that this was possible"
- Disappointing that systems don't work under all circumstances.
- Difficult to assess when and under what circumstances the system does work and doesn't work

General Results (5): After driving (Focusgroup)

Some highlights:

- Overall positive experience, nuances came to the surface
- One does need time to get used to the systems, the presence of instructors was well appreciated.
- Sometimes quick adoption, depending on personal preferences and driving habits
- Differences between the brands, but personal preferences play important role here
- Various opinions: Systems as supporting aid versus systems as extra work load
- Learn that there is interaction between the car(systems), road infrastructure and other road users.

General results (6) After driving (Focus Groups)

- More in depth view on:
  - Role and responsibilaties as a Road Authority in these developments
  - Potential impact on day to day work

Thanks for your attention & Questions

- More results in next sessions!