

Behaviour observation in connection with the evaluation of ISA, STORM and ACC

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Frame

- Wr. Fahrprobe
 - Overview
- Projects
 - STORM
 - ACC
 - ISA

Wr. Fahrprobe

- Overview

Projects

- STORM

- ACC

- ISA

„Wr. Fahrprobe“

- Observation method
- 2 observers
 - Coding observer
 - Free observer
- Standardised route
 - Inhabited areas
 - Rural roads
 - Motorways

Wr. Fahrprobe

- Overview

Projects

- STORM

- ACC

- ISA

„Wr. Fahrprobe“

- Standardised variables
 - Descriptive
 - Positive
 - Neutral
 - Erroneous
 - E.g. speed behaviour

Wr. Fahrprobe

- Overview

Projects

- STORM

- ACC

- ISA

„Wr. Fahrprobe“

- Non-standardised variables
 - Errors
 - Explicit interaction/communication processes
 - Traffic conflicts

Wr. Fahrprobe

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„Wr. Fahrprobe“

- Start of real registration
 - After 15 minutes
- Duration
 - 40 to 60 minutes
 - Between peak hours

„Wr. Fahrprobe“

- Validity I

	Bukasa & Risser 1985	Chaloupka & Risser 1995
Driving extremely on the left or on the right side of the lane		.42 (1%)
Inadequate overtaking		.42 (1%)
Too small lateral distances		.37 (1%)
Delayed lane change in case of obstacles		.38 (1%)
Early change of lane before obstacles	.28 (5%)	

"1%" = highly significant, 5% = significant

„Wr. Fahrprobe“

- Validity II

	Bukasa & Risser 1985	Chaloupka & Risser 1995
Problems with lane choice (e.g., wrong lane for proceeding after intersection)		.48 (1%)
Speed not exceeding limit and well adapted to situation	-.40 (1%)	
Exceeding speed limits	.35 (1%)	.46 (1%)
Early deceleration whenever deceleration becomes necessary	-.24 (5%)	
Distance to the car ahead too short	.33 (1%)	.29 (5%)

"1%" = highly significant, 5% = significant

Projects

- STORM
- ACC
- ISA

Evaluated systems

- STORM
- ACC
- ISA



STORM

- Dual-mode route guidance
 - Autonomous mode
 - Infrastructure-based mode
- 20 persons
- 2 rounds
 - Without equipment
 - With equipment

STORM

- Hypotheses I

- Better adapted speeds and headways
- Less distraction from actual traffic participation tasks
- Heterogeneous compliance could cause problematic interactions

STORM

- Results I

- Too short distances became more frequent
- In fact, more distraction from actual traffic participation tasks
- Heterogeneous compliance did cause problematic interactions

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Fahrprobe

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- **STORM**

- ACC

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Wr.
Fahrprobe

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- **STORM**

- ACC

- ISA

STORM

- **Results I**

- Too short distances became more frequent
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STORM

- Hypothesis II
 - The system has the potential to draw the drivers' attention away from the road and the other road users

STORM

- Results II
 - The system drew the driver's attention away from the road and the other road users

Wr.
Fahrprobe
- overview

Projects

- STORM

- ACC

- ISA

ACC

- Autonomous Cruise Control
 - High degree of automation
 - Low degree of automation
- 20 persons
- Test drive
- Interview

ACC

- Hypothesis I

- Depending on the initial driving style (fast, dynamic, easy, cautious, etc.), the system will have different effects on the behaviour

ACC

- Results I

- Especially dynamic drivers' anticipatory behaviour at all places where there could be vulnerable road users deteriorated

ACC

- Hypotheses II

- Changes in the driver's communication, especially with respect to vulnerable road users (deterioration)
- The drivers' explicit communication is decreasing in frequency

ACC

- Results II

- Driving with the system caused changes in the interaction with vulnerable road users (less considerate)
- The frequency of the communication with other road users in order to clarify the situation decreased

ACC

- Hypothesis II

- Changes in the driver's communication, especially with respect to vulnerable road users (deterioration)
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ACC

- Results II

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Projects

ISA

- Intelligent Speed Adaptation
 - Active accelerator pedal
- 28 persons
- 2 rounds
 - Without equipment
 - With equipment

ISA

- Hypotheses

- The behaviour towards other road users, especially vulnerable road users, will be improved
- The headways to the vehicles in front will increase.
- The drivers get used to the system "taking control" and thereby delegate responsibility

ISA

- **Results**

- The behaviour towards other road users improved

- The headways to the vehicles in front increased slightly

- Drivers forgot to adapt their speed to the speed limit

ISA

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ISA

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ISA

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Thank you for your
attention!