Results on Behaviour, Acceptance, and Usage

Navigation System

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Research questions

Usage of navigation systems and impact on driving:

1. Acceptance & usage
2. Influence on efficiency
3. Impact of handling of navigation systems on driving

Comparison of 2 HMI-solutions:

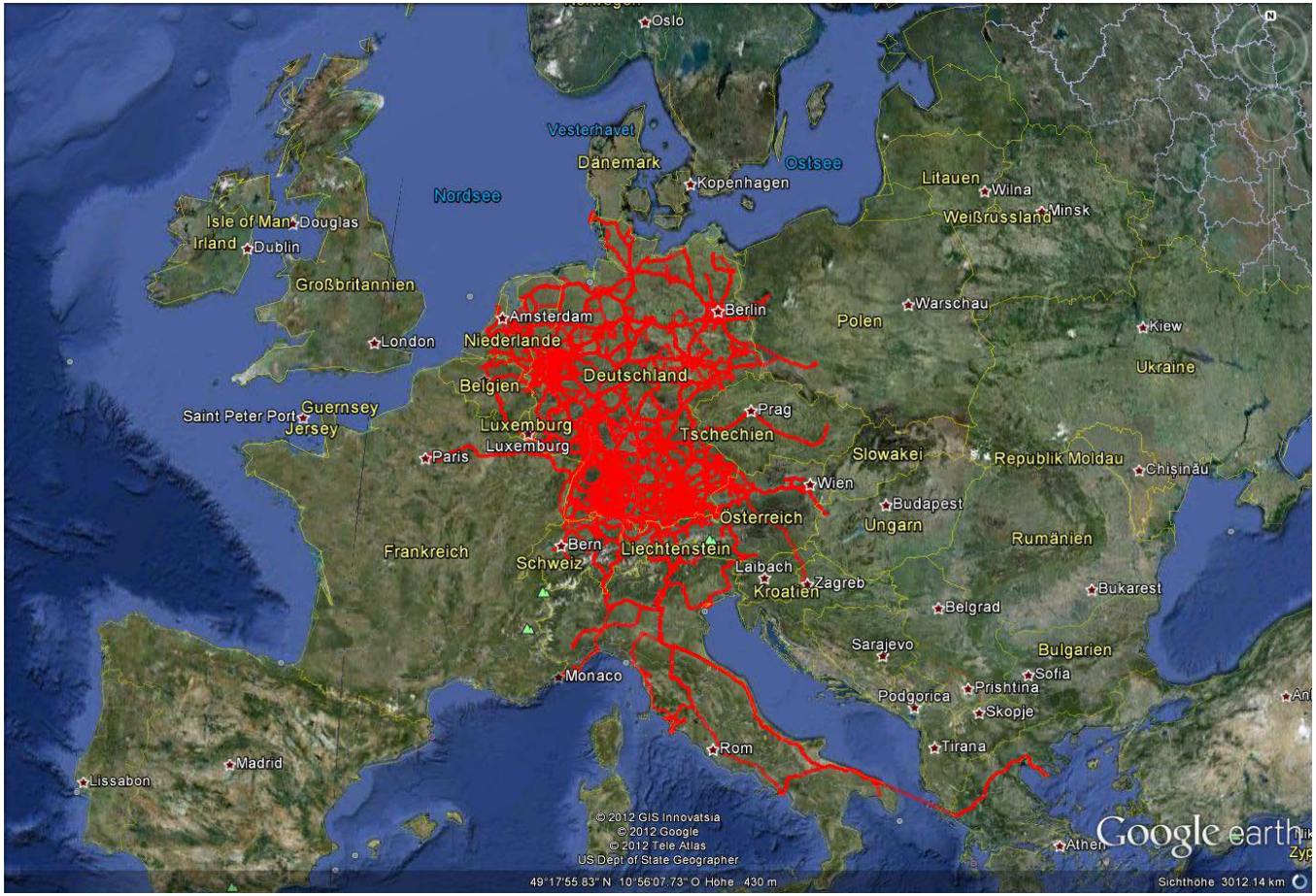
vs.

Built-in

Mobile

Data base

~ 1 000 000 kilometres



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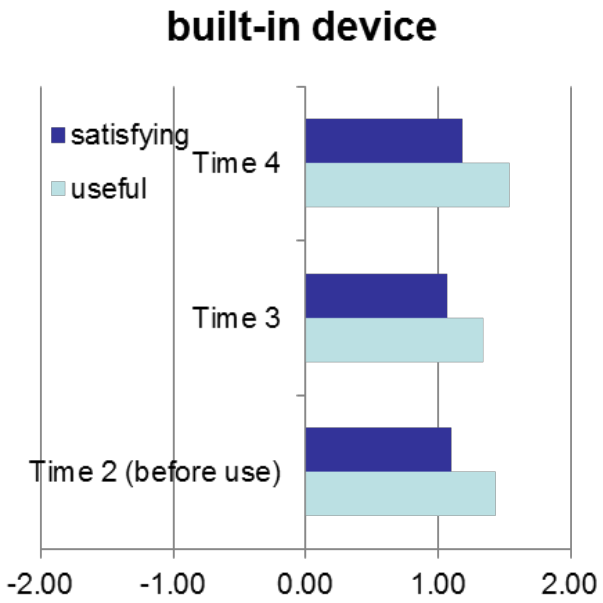
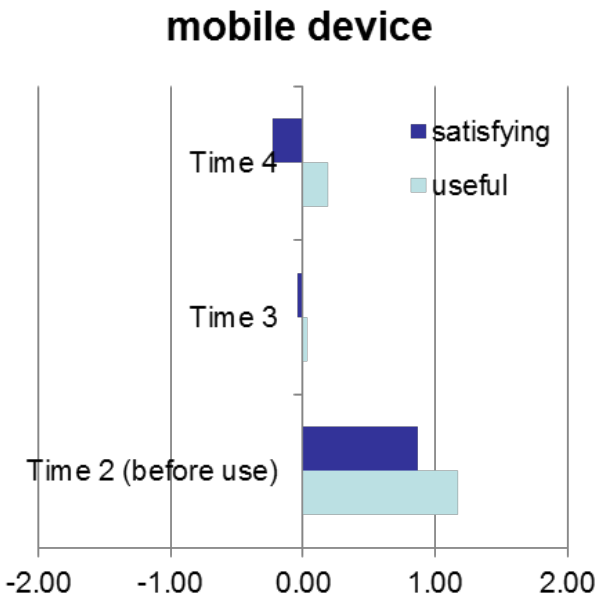
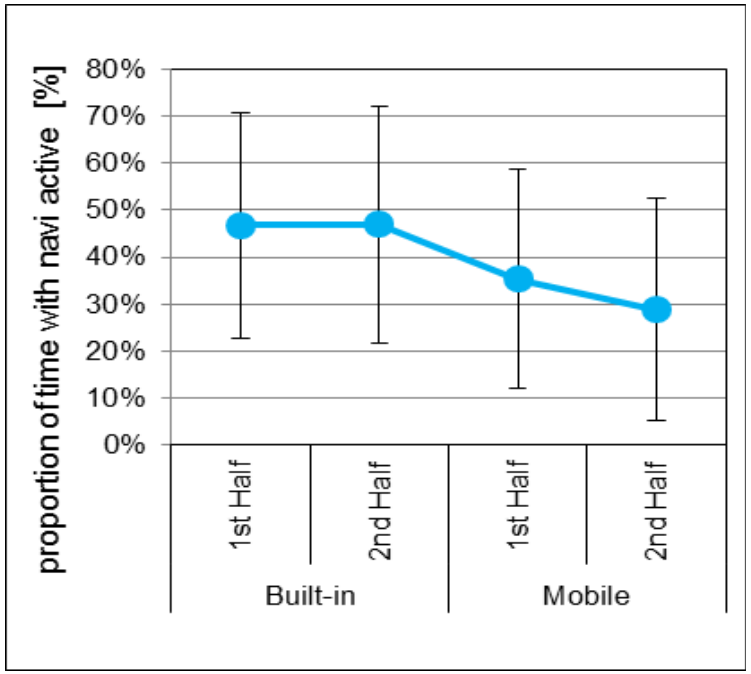
System usage and acceptance





Expectations on both systems are positive, but the mobile device does not fulfil the expectations.

System usage and acceptance

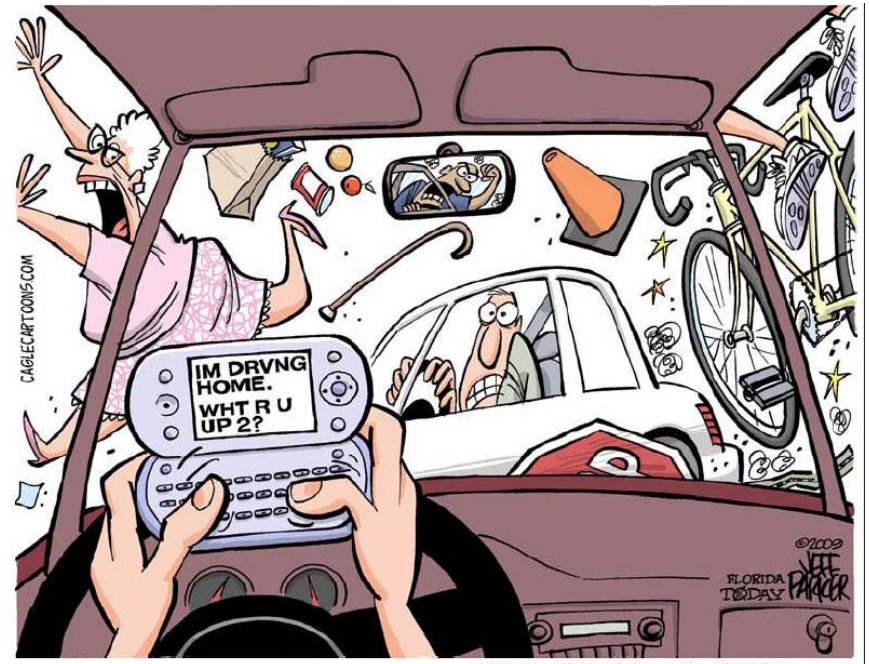


Usage reflects subjective evaluation of systems

- Significantly higher usage of built-in systems
- Significant decrease of usage of mobile device over time

Analysis of system handling

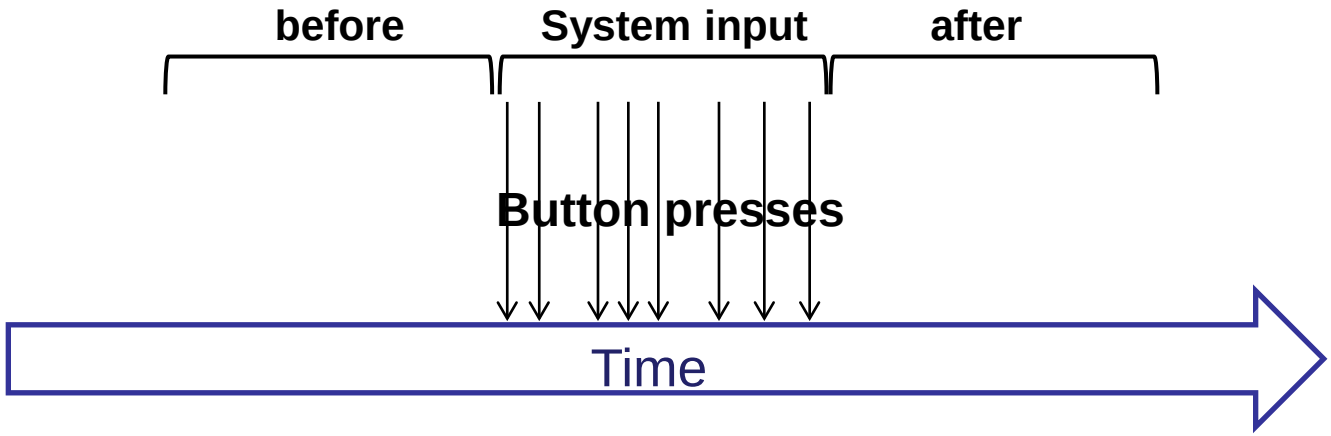
- In the literature, impact of system handling (e.g. entering a destination) is widely investigated
- Negative impacts on driving safety are reported



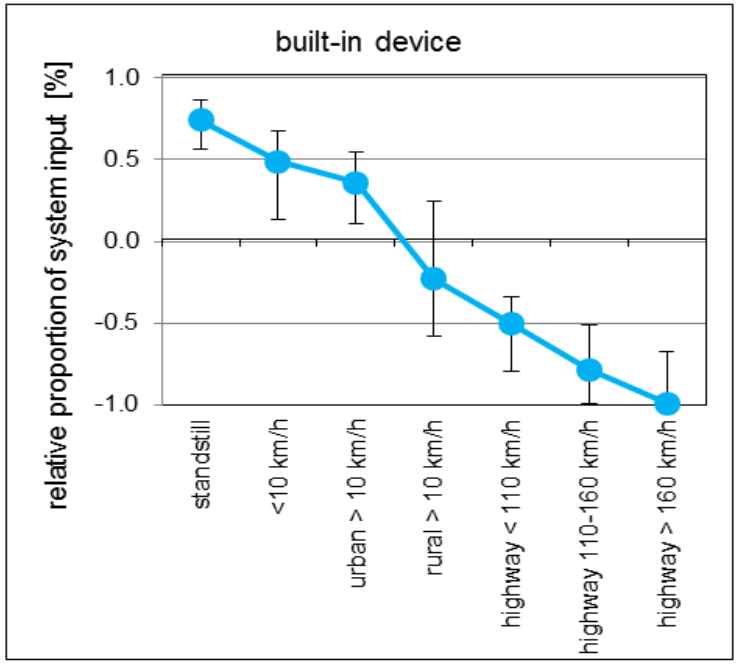
Jeff Parker / Florida Today, courtesy CagleCartoons.com

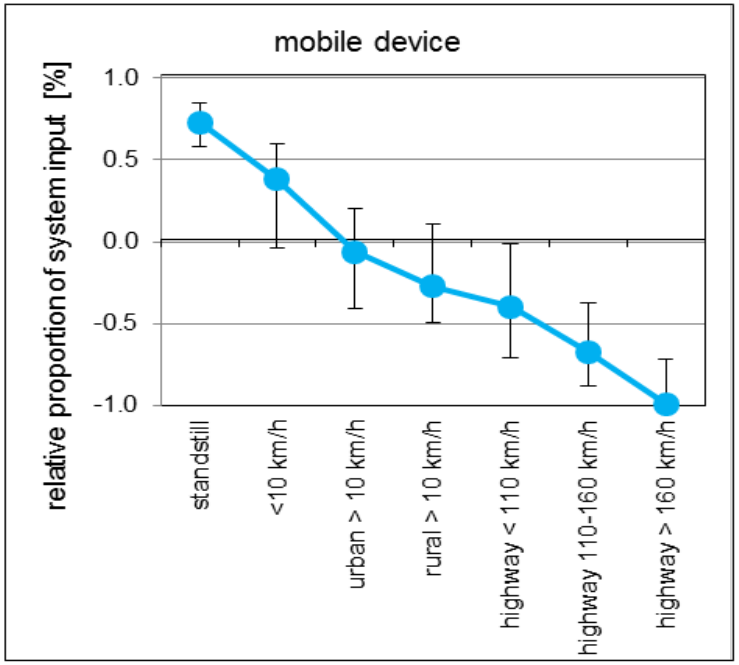
System handling - Approach

- System inputs are merged into system handling if distance between 2 inputs is less than 5 sec
- Comparison of directly before, during and directly after system handling



System handling - 1





- System handling in standstill and at low speeds is generally preferred.
- System handling on rural roads or highways rarely occurs.

Impact of system handling

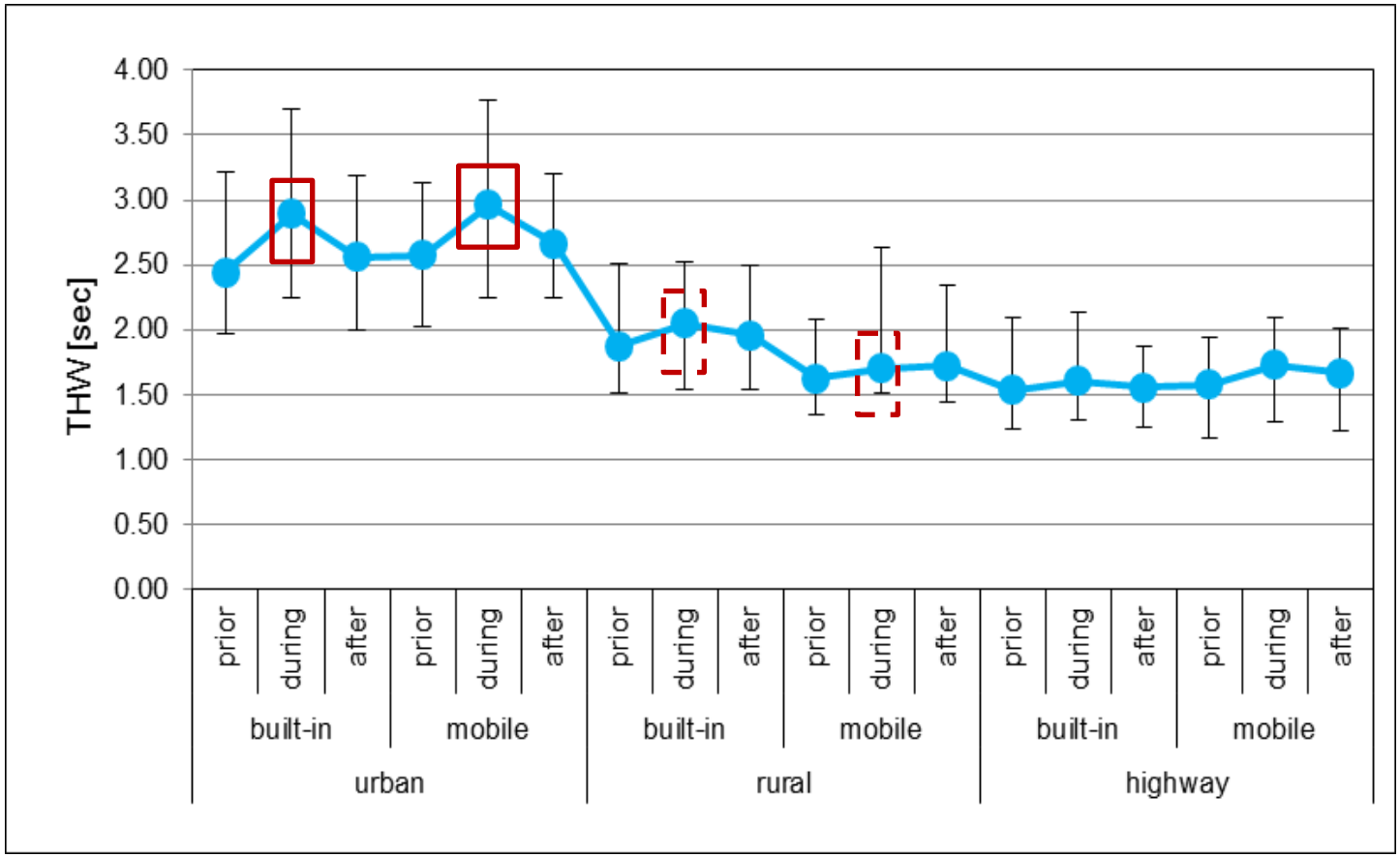
Evaluation of active compensation by the drivers

- Change of speed
- Distance to lead vehicle
- Lane keeping performance

Evaluation of impact on driving safety

- Critical distance
- Bad lane keeping

Impact of system handling – Example distance



System handling - 2

- Especially on urban & rural roads compensation in driving during system inputs
- No indication that safety critical changes occur in driving during system inputs

		Built-in			Mobile		
		Highway	Rural	Urban	Highway	Rural	Urban
Active compen-sation	Speed		<<	<<		<<	
	Distance		>	>>		>	>>
	Lane keeping				>>		>>
Safety impact	Crit. distance	<<		<<	<<		<<
	Bad lane keep.	<<					

Summary of main results

- Navigation systems are highly accepted and widely used driver assistance systems.
- Built-in navigation systems are preferred to the mobile device.
- Difference in subjective evaluation is reflected in usage.

- Drivers compensate for the distraction caused by handling a navigation system.
- There is no indication that handling of navigation systems degrades driving safety.

8 Functionalities, 28 Partners, 1000 Vehicles

1 Field Operational Test, **8 Functionalities**

28 Partners, 1000 Vehicles, 1 Field Operational Test

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