



Humans and Automated Driving Systems

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Toshio Yokoyama

Executive Chief Engineer

Honda R&D Co., Ltd. Automobile R&D Center

Cross-ministerial Strategic Innovation promotion Program (SIP)



Contents

1. Overview

- Goal of SIP activity and framework

2. Challenges and approaches

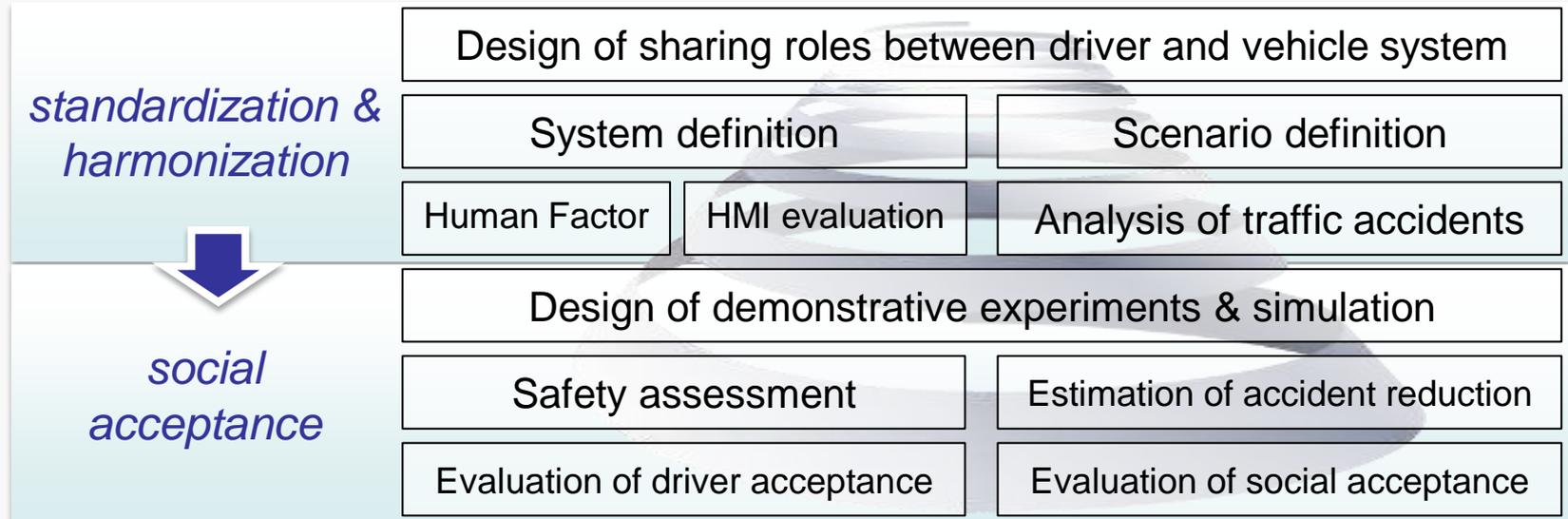
- Systems & Humans
- Systems & Other Traffic Participants
- Systems & Society

3. Summary



1. Overview

- **Goal of SIP activity**
 - Contribution to establish standardization and harmonization
 - Nourish social acceptance for the realization and promotion
- **Framework**



2. Challenges and approaches

- **Humans & Systems (approach in 3 phases)**

- Authority and responsibility for safety

- Human-in-the-loop / Human-out-of-the-loop

Thought experiments

- Trading of control between driver and automation

- Human-machine interface and interaction

Demonstrative experiments

- Negative effects of automation, such as

- Vigilance decrement

- Mode error / confusion

- Complacency (Over trust)

- Automation surprises

- Overreliance

- Misuse / Disuse / Abuse

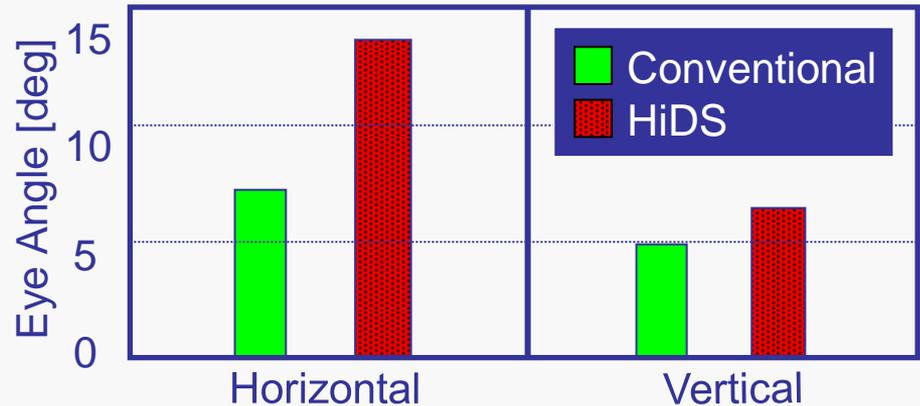
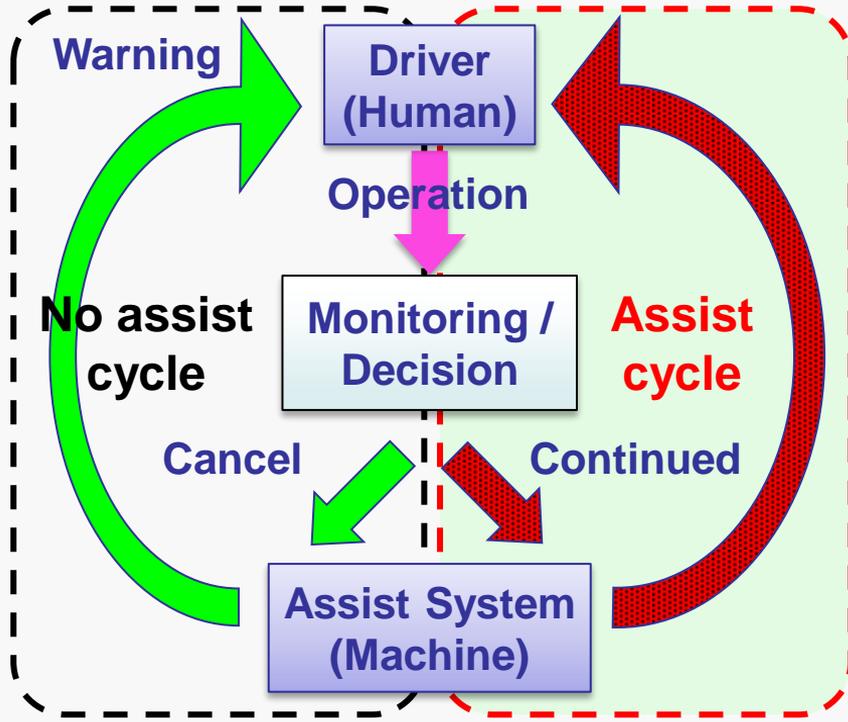
- Loss of system awareness or situation awareness

- Skill degradation

Result evaluation

Humans & Systems – Human Centered Automaton

- Human Machine Interaction System (HMIS)



Human Centered System in Honda Intelligent Driver Support System (HiDS), Society of Automotive Engineering Japan, March, 2003

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Humans & Systems - Thought experiments based on scenario

Human-out-of-the-loop/-in-the-loop

- NHTSA Level 3
- Conditional Automation

Human-in-the-loop

- NHTSA Level 2
- Partial Automation



Use case



Relaxed



Concentrated



Resume driving task

Timeline



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Systems & Other Traffic Participants

- Human Friendly Interfaces in the mixed traffic



Safety for Everyone



Systems & Society

- Social acceptance
- Legal issues, ...

Nourishment of social acceptance

OEM / Supplier

- Functions, Effects
- Definition of the roll of a driver

Customer

- Expectations
- Understanding of the role of a driver

Minimization new risks due to automation

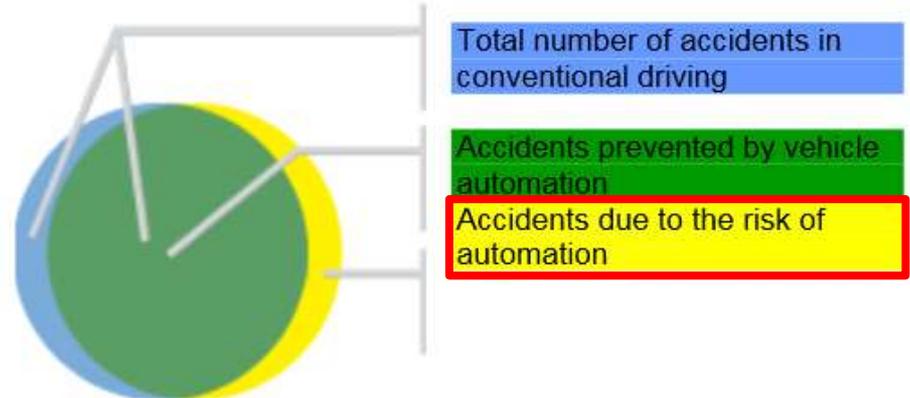


Fig. 4-1: Theoretical potential for accident prevention in vehicle automation (Source: project group)

BAST study about the legal consequences of automation
(Legal consequences of an increase in vehicle automation)

http://bast.opus.hbz-nrw.de/volltexte/2013/723/pdf/Legal_consequences_of_an_increase_in_vehicle_automation.pdf

3. Summary

1. Overview

- Goal of SIP activity and framework

2. Challenges and approaches

- Systems & Humans
 - Extract system requirements based on human factors.
- Systems & Other Traffic Participants
 - Mutual understanding in mixed traffic society.
- Systems & Society
 - Nourishment social acceptance and minimization new risks due to automation.

4. Call for discussion

**Now we are open to discuss various topics around
'Humans and Automated Driving Systems'.**

**Please come and join discussion
on November 17-18 in Japan!!**

Or any discussions now ?

Thank you.