Driver usage and understanding of adaptive cruise control

Annika Larsson
Lund University
Introduction

Automation increasingly part of everyday driving
é not perfect yet, though

Driver needs to reclaim control ï we need to know more!

Study: Questionnaire to 130 ACC users
How ACC is used, what drivers think about the system
Issues in reclaiming control

- Are system limitations known to the driver?
- Can the driver be supported by removing driving tasks?
- Does the driver understand what the system is doing?
- Can we rely on driver monitoring of system performance?
Results

- Drivers learn more about system limitations over time

- System limitations cause transfer of control
  - Sharp turns
  - Roundabouts
  - Etc

- Frequent transfers of control may be better than infrequent transfers

- Drivers are not always aware if the system is on/off
Resilience

Increasing performance does not imply creating a safer car-human system when automation fails.

It may be relevant to communicate detection decrements, not only that detection has been lost.
The three W’s

- Why does the driver reclaim control?
- When does the driver reclaim control?
- What happens when the driver reclaims control?
Future research

Å Transfer of control
  ï How do drivers experience delegating control to a system?
  ï How do they experience the transfer of control?

Å Perception and attention
  ï What are the effects on driver perception and attention?
  ï Is “mode error” a suitable concept in this area as well?
Summary

- Need to know more about the transfers
  - Effects on cognition
  - Effects on performance (joint and human)
  - Effects over time

- Now: Studying different ways to delegate control, and the effects on driver cognition and planning
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annika.larsson@tft.lth.se