Selective Automated Driving As a Pivotal Element To Solve Safety And Environmental Issues In Personal Mobility

Reiner Höger
Continental Automotive GmbH

ITS World Congress, 2009, Stockholm, Sweden
Need For Action

- Despite all success in passive safety the toll of injured and killed people in traffic is too high
- Environmental impact must be minimized
  - Fuel consumption (CO\textsubscript{2}) and emissions
  - Road infra-structure
- Increasing density and complexity of traffic
  - Loss of convenience
  - Increasing number of elderly drivers
  - Unpredictable duration of trip

OECD International Transport Forum
http://internationaltransportforum.org/statistics/trends/index.html#Road_Accidents

http://www.pdphoto.org/PictureDetail.php?mat=&pg=7228
Root Cause and the HAVEit Approach: Automation to Assist and Not Replacing the Driver

Causes of Fatal Accidents

- Psychological Factors: 38%
- Miscalculation: 46%
- Unexpected Behavior: 11%
- Technical Problems: 5%

Driver performance vs. need for assistance

HAVEit

Driver
- Driver only
- Assisted
- Semi-autom.
- Highly-autom.
- Fully-autom.

Automation
The Central Element of HAVEit: Joint System

- **C1: Perception layer**
  - Sensor x
  - Sensor y
  - C2X
  - Datafusion

- **C2: Command layer**
  - CoPilot
  - Command generation and plausibilization
  - MSU
  - Automation level
  - Driver monitoring
  - Driver state assessment
  - Direct control (e.g., emergency brake)

- **C3: Execution layer**
  - Drivetrain control
  - Motion control vector
  - Actuator x
  - Actuator y
  - Actuator z

- **C4: HMI to integrate the driver**
  - HMI
  - Driver state assessment
  - Driver monitoring

**Joint system**

**joint system**
One Approach: Several Use Cases

Highly automated driving

- Safety enhancement
  - Driver overload (demanding driving tasks)
  - Driver underload (monotonous driving tasks)

- Energy optimization, emission reduction
  - Active Green Driving (Energy Optimizing Copilot)
  - Temporary Autopilot
  - Automated Queue Assistance

Automated Assistance in Roadworks
HAVEit Consortium
Thank you!

Dr. Reiner Hoeger

HAVEit Coordinator
Continental Automotive GmbH
Systems and Technology Automotive, S&T A
Siemensstrasse 12, 93055 Regensburg, Germany

Phone: +49 941 790 3673
E-Mail: Reiner.Hoeger@continental-corporation.com

For more information, please visit our website: www.HAVEit-eu.org