Agenda

1 | Differences
   manual / automated / autonomous driving

2 | Challenges for automated driving

3 | Summary
DEFINITION & FUNCTIONALITY OF AUTOMATED DRIVING
Autonomous Driving functionalities and challenges

Five levels of automated driving

- **Driver only** (Level 0)
- **Driver assistance** (Level 1)
- **Partly automated** (Level 2)
- **Highly automated** (Level 3)
- **Fully automated** (Level 4)

Degree of automation:
- **Driver**
- **Vehicle**

Source: Adapted from Wienerstädtische Versicherung AG and VDA/BAST, SAE
Autonomous Driving functionalities and challenges

Five levels of autonomous driving

Level 0: Driver only
Level 1: Driver assistance
Level 2: Partly automated
Level 3: Highly automated
Level 4: Fully automated
Level 5: Full automation

Degree of automation
CHALLENGES IN THE FIELD OF AUTOMATED DRIVING
Autonomous Driving functionalities and challenges

Schematic event chain
Autonomous Driving functionalities and challenges

Possible Sensor Set – optimized for specific user functions/use cases

- Long Range Radar
- Camera
- Mid Range Radar
- Ultrasonic Sensor
- LIDAR (light detection and ranging)
Autonomous Driving functionalities and challenges

Schematic event chain

- Outside Car

**PREPROCESSING**
- Mapping
- Traffic recognition

**INFRASTRUCTURE**
- Maps
- Traffic information
- Parking space management
- Traffic manipulation

**HMI**
- HMI car
- Mobile devices
Autonomous Driving functionalities and challenges

Schematic event chain

• In Car - SW

PERCEPTION

- Sensor Data Fusion
- Localization
- Object classification
- Interpretation

CORE FUNCTION

- Decision
- Path planning
- Trajectory planning
- Collision avoidance
- Closed loop actuation elements

In Car - SW

FUTURE MOBILITY SOLUTIONS
Autonomous Driving functionalities and challenges

Validation of autonomous driving features
Autonomous Driving functionalities and challenges

Virtual testing of automated driving features
Autonomous Driving functionalities and challenges

Functionalities

Advantages:

- Reduction of accidents (Vision Zero)
- Better utilization of infrastructure
- Lower environmental impact
- Increased productivity
- More comfort
- ...
SUMMARY
Autonomous Driving functionalities and challenges

Summary

Challenges still not solved on many levels. Even insurance and liability not yet decided.

Field of technology: sensors, algorithms, interfaces, safety, security, validation

FMS offers sustainable and integrated solutions in the field of algorithm development, backend IT, tool development, security, vehicle construction and consulting from one single source.
FUTURE MOBILITY SOLUTIONS

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