Road safety – influence of driver assistance

Number of road fatalities reduced by 60% within last 14 years

- 90% of all car accidents involving injury are caused by human error
- Introduction of further driver assistance systems will amplify positive trend

**Graph:**
- Skidding avoidance (ESP)
- Safe braking and steering (ABS)
- Road fatalities
- Driver assistance

**Source:** Bosch, DAT, BASt. Based on total vehicle fleet.

1 Figures estimated
2 ACC and lane keeping support only
Driver assistance – Assistance functions

- Park and maneuver assistance
- Travel assistance
- Predictive pedestrian protection
- Turn and crossing assistance
- Driver monitoring
- Light and sight assistance
- Evasion assistance
- Lane assistance
- Predictive emergency braking

Function cluster

- Radar sensors
- Video cameras
- Ultrasonic sensors
- DASy
- Active safety systems
- Electric/active power steering
- Restraint systems
- Networked navigation
Positioning: Our competence is your success factor

A pioneer in automotive radar technology
More than 35 years experience
First supplier producing more than 1 Million 77GHz radar sensor

Extensive video experience
More than 20 years experience
Bosch 1st supplier w/ Stereo Video as single sensor EU-NCAP – SOP

Expert in system design and sensor data fusion
All technologies and competencies in-house
Fusion systems in series production since 2009

Parking and maneuvering assistance
USS market leader, 25 years experience, 250 Mio ultrasonic sensors sold
Successful entry in near range camera biz 2013
Surround sensor portfolio

360° surround sensing by combination of different sensors

- Long- and mid-range radar prerequisite for driving at higher speed
- Satisfy reliability requirements by using multiple sensors for each area
Requirements for Automated Driving

**Legislation**
- global standards and clear liability

**Safety and Security**
- protect against technical failure and deliberate cyber attacks

**Surround Sensing**
- highly robust in all use cases

**System Architecture**
- redundancies for sensing, ECUs, and actuation (fail operational)

**Localisation**
- Maps: always precise and up-to-date

**System Intelligence**
- Interpret the situation, plan, decide and execute
Vehicle Motion Control

(→ How to get from A to B)

Automated

- Parking
- Driving

Increasing safety requirements, no permanent supervision by driver

Connectivity

- Predictive data & ctrl.
- Sensing vehicle

Brake Systems
- Vacuum-free solution & torque blending capability

Steering Systems

Powertrain Systems
- Electrification

Increasing safety requirements
- Redundant braking & steering capability
- High dynamics, precise actuation

CO2-reduction

Market Trends and Drivers
Vehicle Motion and Control – System of Systems

Vehicle Motion Control enables cross-domain vehicle dynamics!
Future Cross Domain Functions – Examples

Example 1: Assisted Evasive Steering Support (SOP 2015), eAEB

Example 2: Automated Highway Pilot – Safe Stop in same lane

Example 3: Connected Predictive Motion Control based on road condition map

Vehicle Motion Control – Key enabler for future functions
THANK YOU FOR YOUR ATTENTION