BEYOND ADAS – HIGHLY AND FULLY AUTOMATED DRIVING.
BARCLAYS SELECT SERIES DISRUPTIVE MOBILITY.
LONDON, 2016.

Dirk Wisselmann, Senior Engineer Driver Assistance.
08.09.2016
FIRST IDEAS BEING IMPLEMENTED 10 YEARS AGO.

**BMW Track Trainer (2006).**

**Remote Controlled Parking (2008).**

**Emergency stop assistant (2009).**

**Highly automated driving on the motorway (Gen1: 2011; Gen2: 2014).**

**Highly automated driving at the limits of vehicle dynamics (2014).**

**Fully automated remote valet parking (2015).**
DRIVING EXPERIENCE REDEFINED. CUSTOMER BENEFIT AS THE FOCAL POINT.

Delegation

Driver unchallenged

Ability

„FLOW“

Safety

Driver overchallenged

--- Need for automation of driving tasks---

THE NEW BMW 7 SERIES DRIVER ASSISTANCE PROVIDES COMFORT AND SAFETY AT THE HIGHEST LEVEL.

- Crossing traffic warning rear / front
- Lane keeping assistant with active side collision protection
- Active cruise control with Stop&Go function
- Rear collision prevention
- Distance information
- Night Vision
- Speed Limit Device
- Lateral parking aid
- Lane departure warning
- Speed limit and No Pass information
- Lane change warning
- Speed Limit Assist
- Approach control warning with braking function
- Panorama View
- 3D View
- Top View
- Parking assistant
- Active Park Distance Control
- BMW Selective Beam
- Remote Control Parking

ON THE WAY TOWARDS AUTOMATIC DRIVING. THE AUTOMOBILE WORLD CHANGES.

Automated Driving is a customer request.

- Sheer driving pleasure will also mean to relieve the driver.
- Time spent in the vehicle can be used productively.

Automation-Change

Pull: Customer Benefits

- HAD is the chance, to make the next big step towards accident free driving.

New players are entering the market

Push: New Players

- Google and Uber run the „Driverless Car“ as Game Changer for urban mobility („Automated Ridesharing“).

- Actors from other markets with deep knowledge in robotics and artificial intelligence.
LEVEL OF AUTOMATION.

Human  

Transition in Responsibility  

Machine

Level 0  L1-Assisted  L2-PAD  L3-HAD  L4-FAD  L5-FAD

Driver  Lateral or Longitudinal Assistance  Observation of Environment  Awareness for Take Over  No Driver Interaction  No Driver

No System  Hands on  Eyes on  Hands on  Eyes on  Hands off  Eyes off  Hands off  Eyes off  Hands off

Lateral or Longitudinal Assistance  Lateral and Longitudinal Assistance  Take Over Request  No Take Over Request  No Driver Interaction  No Driver

Car

“PLAYGROUND“ AUTOMATION: ROLLOUT LIMITED BY SCENARIO COMPLEXITY AND DRIVING SPEED.

L4/5: 1st Generation FAD >2025 (Phase-In >2020)

L2: e.g. BMW 7-series, today

L3/L4: 1st Generation HAD >2020
2nd Generation FAD

Complexity Traffic Scenario

Next Generation HAD/FAD?

Next Generation HAD/FAD?

Driving Speed

Inner City
New Mobility Concepts

Rural
Flow & Safety

Highway
Travelling Comfort & Safety

HIGHLY AUTOMATED DRIVING (L3-HAD): HIGHWAY PILOT. TAKE OVER SCENARIO.
AUTONOMOUS DRIVING (L4/5-FAD): NEW MOBILITY SERVICES.
ARCHITECTURE FOR AUTOMATED DRIVING. END-TO-END WITH ALL KEY-TECHNOLOGIES.

E/E ARCHITECTURE

SENSORs

MOTION CONTROL

BACKEND

ENVIRONMENT MODEL

HD-MAP

OBJECTS AND FREE SPACE

FAD DRIVING FUNCTION

TRAJECTORY PLANNING

DRIVING STRATEGY

BACKEND SECURITY

CD Backend

FAS Backend

MS Backend

VEHICLE SECURITY

ARTIFICIAL INTELLIGENCE

CROSS-INDUSTRY-COOPERATION. SHAPING THE FUTURE – BMW, INTEL AND MOBILEYE.

- Three industry leaders
- AD technology to series production
- Target: iNEXT 2021
- Open platform as an industry standard
- Sensors and supercomputer with a real-time environmental model
- New mobility services / ride sharing
HERE provides high-definition maps and thus the basis for new driving assistance systems up to highly-automated driving.

The combination with real-time vehicle data optimizes traffic security and the offer of individual services.

HERE remains an open and independent platform for cloud-based maps and mobility services.
We see the existing principles as suitable for automated vehicles.

Today only technical, no ethical decisions – working towards “vision zero”

HAD regulation expected within this decade.
DRIVING LUXURY.
THE ALL NEW BMW 7-SERIES.

THANK YOU FOR YOUR ATTENTION.