BEYOND ADAS – HIGHLY AND FULLY AUTOMATED DRIVING.
BARCLAYS SELECT SERIES DISRUPTIVE MOBILITY.
LONDON, 2016.
FIRST IDEAS BEING IMPLEMENTED 10 YEARS AGO.

- BMW Track Trainer (2006).
- 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
- Steering and lane control assistant
- Panorama View
- 3D View
- Top View
- Parking assistant
- Active Park Distance Control
- BMW Selective Beam
- Remote Control Parking
- 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

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.

Pull: Customer Benefits

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

Automation Change

New players are entering the market

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

Push: New Players

Actors from other markets with deep knowledge in robotics and artificial intelligence.

LEVEL OF AUTOMATION.

Human → Transition in Responsibility → Machine

Level 0

- No System
- Driver
- Hands on
- Eyes on

L1-Assisted

- Lateral or Longitudinal Assistance
- Hands on
- Eyes on

L2-PAD

- Observation of Environment
- Hands temp. off
- Eyes temp. off

L3-HAD

- Lateral and Longitudinal Assistance
- Hands off
- Eyes off
- Take Over Request
- Awareness for Take Over

L4-FAD

- No Driver Interaction
- Hands off
- Mind off
- No Take Over Request

L5-FAD

- No Driver
- Hands off
- Men off

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

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

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

Next Generation HAD/FAD?

Inner City
New Mobility Concepts

Highway
Travelling Comfort & Safety

Next Generation HAD/FAD?

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

Rural
Flow & Safety

HIGHLY AUTOMATED DRIVING (L3-HAD): HIGHWAY PILOT. TAKE OVER SCENARIO.
AUTONOMOUS DRIVING (L4/5-FAD): NEW MOBILITY SERVICES.

Step 1: Autonomous Driving to/from customer

Step 2: Autonomous Relocation during Night

Step 3: Fully Automated Driving/Ridesharing

ARCHITECTURE FOR AUTOMATED DRIVING. END-TO-END WITH ALL KEY-TECHNOLOGIES.

E/E ARCHITECTURE

BACKEND

ENVIRONMENT MODEL

HD-MAP

MOBILITY CONTROL

FAD DRIVING FUNCTION

TRAJECTORY PLANNING

SENSORS

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.
LEGAL ASPECTS....

We see the existing principles as suitable for automated vehicles.

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

Homologation and Certification

HAD regulation expected within this decade.

Technology

Liability

Ethics

DRIVING LUXURY.
THE ALL NEW BMW 7-SERIES.

THANK YOU FOR YOUR ATTENTION.