DIRK WISSELMANN
12. APRIL 2018

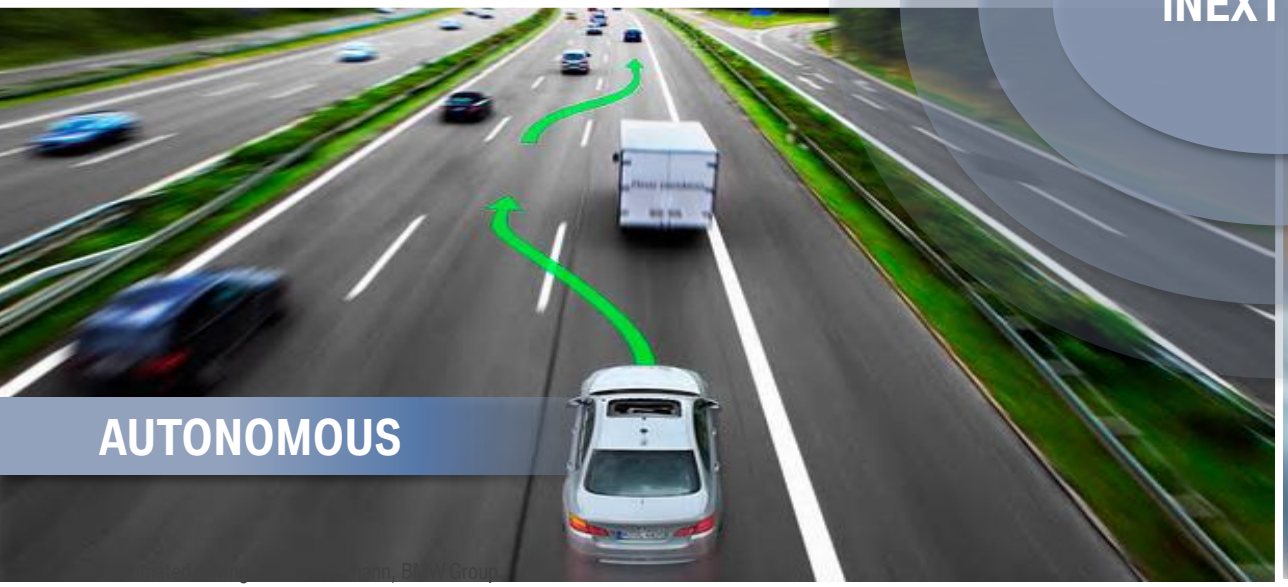
BMW 2021: THE WAY TOWARDS AUTONOMOUS DRIVING.

AUTOMATICAR 2018.
BASEL.

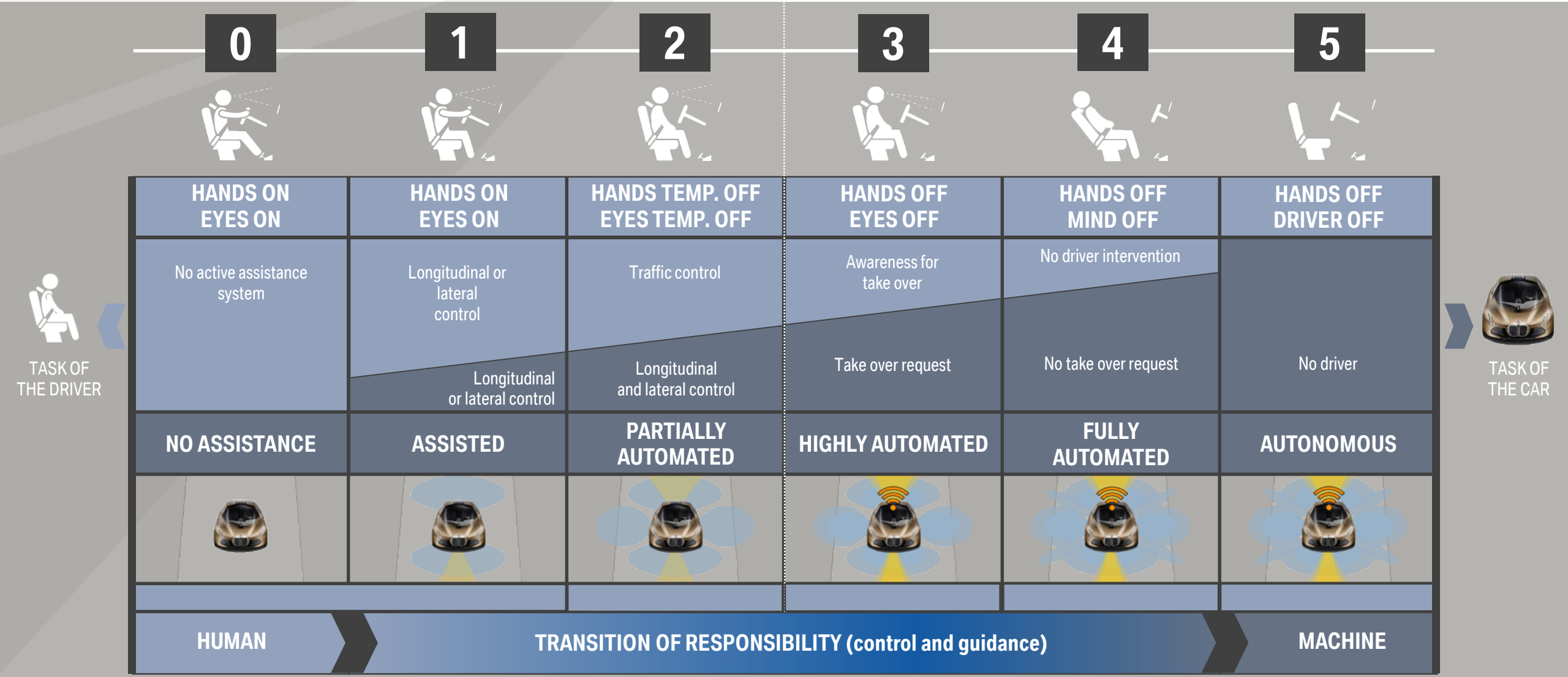
Automated driving. Dirk Wisselmann, BMW Group.

A C E S – FUTURE OF MOBILITY.

iNEXT 2021



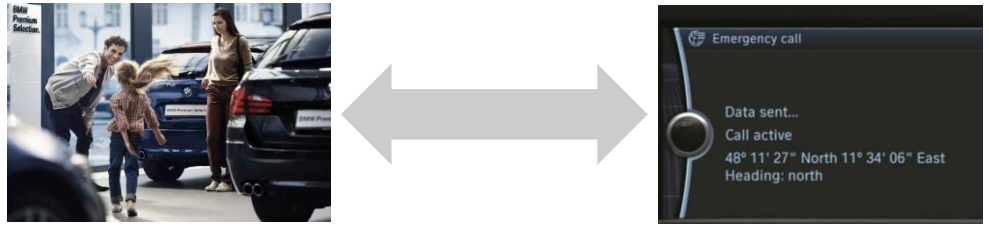
LEVEL OF AUTOMATION.



TODAY'S ADAS TECHNOLOGIES PREVENT 30% OF CRASHES ON AVERAGE.

- **Population-based study of the US market**
  - Over 1 Million BMW passenger cars (Model year 2014+)
  - Approx. 15,500 crashes
  - Study period of 4 years (2014-2017)
- **Active Driving Assistant** (includes frontal crash warning with city collision mitigation/automatic emergency braking and lane departure warning) **prevents 23% of crashes**.
- **27% less likely to have a frontal crash** compared to vehicles without ADAS.
- **15% less likely to have a side impact crash** compared to vehicles without ADAS.
- **Effectiveness of ADAS increases for newer models**: 2014 models are 13% less likely to crash versus 35% for 2017/18 model year
- **3584 crashes would be prevented** if Active Driver Assistant was deployed in all Model Year 2014+ BMW passenger vehicles over the study period in the US.

Correlating sales data with accident data

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DRIVER ASSISTANCE IN THE NEW BMW 5 SERIES: DRIVING COMFORT, DRIVING SAFETY, PARKING

Top View Remote

Crossing traffic warning rear / front

Night Vision

Lateral parking aid

Distance information

Lane keeping assistant with active side collision protection

Lane departure warning

Active cruise control with Stop&Go function

Rear collision prevention

Crossroad Assist

Wrong Way Assist

Lane change warning

Speed Limit Assist

Approach control warning with braking function

3D View

Top View

Parking assistant

Steering and lane control assistant

Speed limit and No Pass information

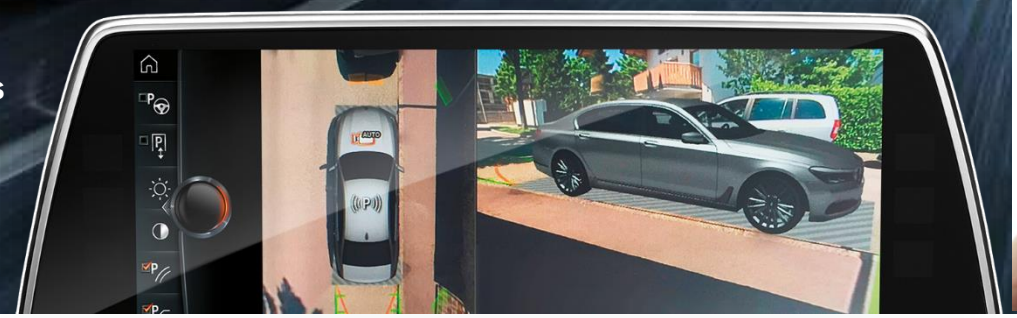
Active Park Distance Control

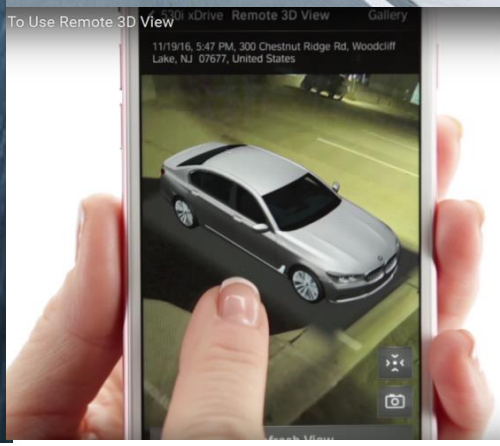
BMW Selective Beam

Panorama View

Remote Control Parking

Speed Limit Device





END-TO-END ARCHITECTURE FOR AUTONOMOUS DRIVING. FOCUS: ENVIRONMENT MODEL, DATA CENTER AND DRIVING POLICY.

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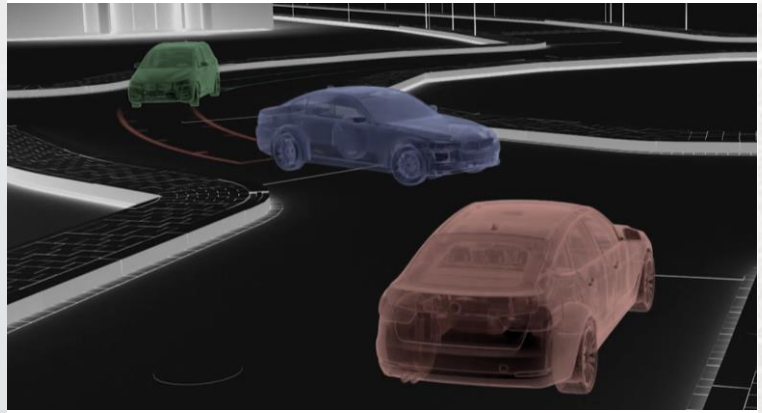
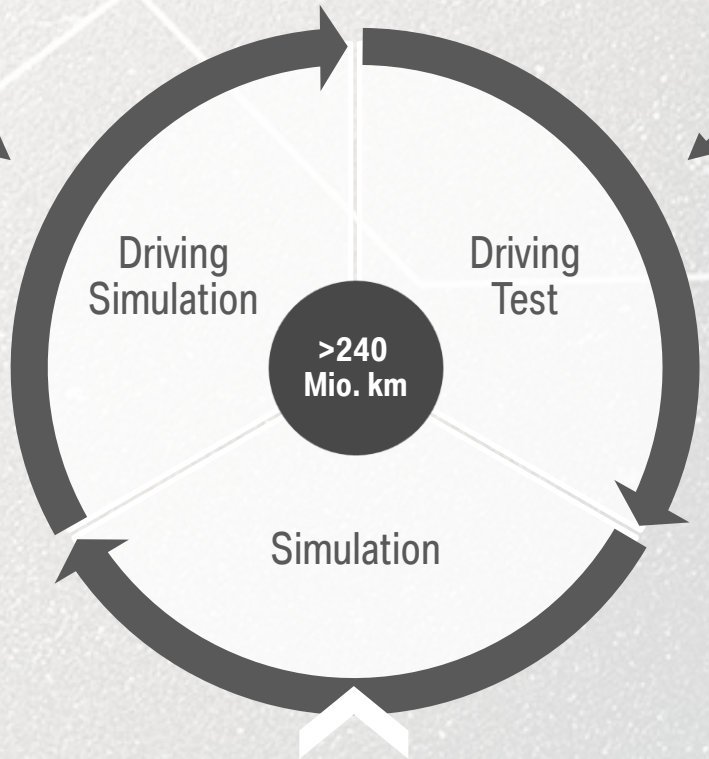
SAFETY FIRST: MORE THAN 240 MILLIONS OF KILOMETERS WITHOUT ACCIDENTS TO BE COMPLETED.

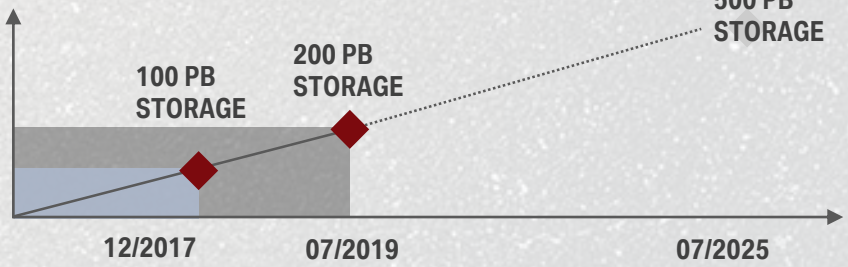
DRIVING SIMULATION AND SW IN THE LOOP.



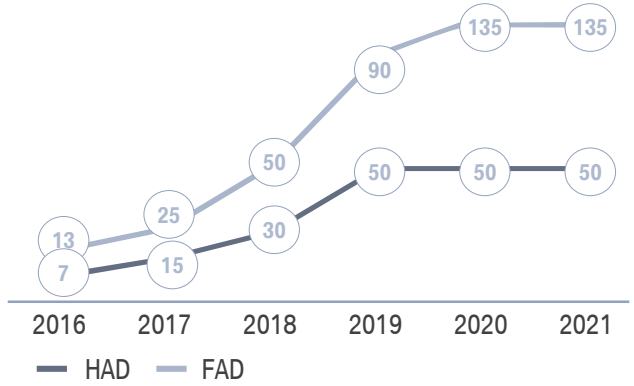
REPRODUCIBLE CUSTOMER USE CASES
→ **REQUIRED >95%**



DATA CENTER
Co-Location in Unterschleißheim



PROTOTYPE VEHICLE BUILD UP.



FAD: 5TB/H → 40TB/DAY 8H/5 DAY RUNNING
HAD: 2TB/H →16TB/DAY 8H/5 DAY RUNNING

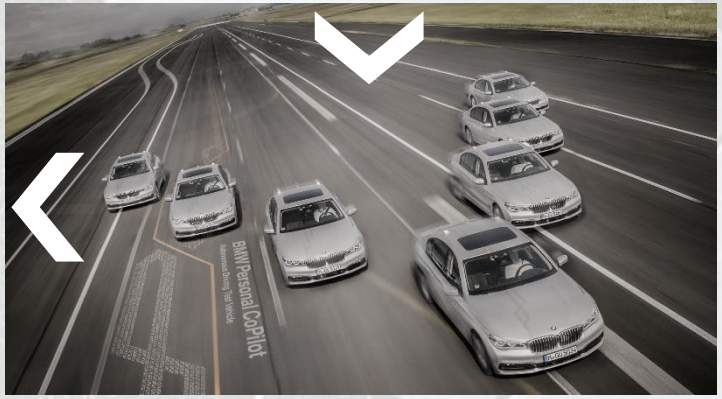


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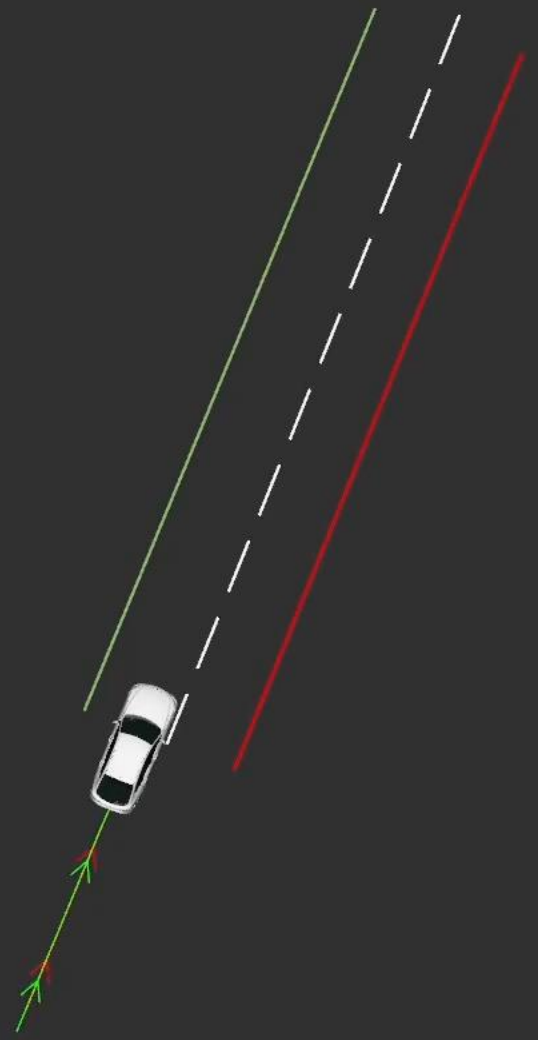
Image



AUTOMATED DRIVING – LEGAL ASPECTS.

Homologation and Certification

- Germany enacted in June 2017 the worldwide first law to regulate the operation of L3/4-vehicles.
- Further legal adaptions are required (STVO, UN-ECE).

Liability

- Less accidents caused by individual driving faults. Increasing relevance of technical mistakes and product liability.
- We see the existing liability-principles as particularly suitable for partially, highly and fully automated vehicles.

Ethics (machine decisions)

- Qualification-Algorithms violate the human rights. Priorization of material damage to avoid injuries of persons should be possible.
- Ethical decisions („qualification“) nearly not to find in todays accident studies.
- With further improvement of perception capabilities realization of vision „zero“.

EXCITING TIMES AHEAD – THANK YOU FOR YOUR INTEREST.

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