

The Evolutionary Path to Automated Driving

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SensePlanAct

The Three Pillars of Automated Driving

More safety, comfort and efficiency

Safety

- › Less accidents
- › Convenient ride

~90% of all accidents are due to human error.



Comfort

- › Personal mobility
- › Private space
- › Freedom of time utilization

American driver wasted **38** hours / year sitting in traffic.



Efficiency

- › Smooth traffic flow, less fuel consumption

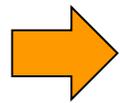
Driving style can influence fuel consumption by up to **20%**



Automated Driving

Motivations and success factors

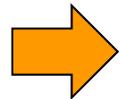
Motivation 1: Accident-free driving (boosting Vision Zero)



Success depends on economic valued cost/benefit ratio

(e.g. \$199 bn.* economic saving potential in U.S.)

Motivation 2: Converting driving time to more productive time



Success depends on consumer valued cost/benefit ratio

* per NHTSA Technical Report DOT HS 812 013

Our Taxi to the Future has Started Already

Driver assistants help us while we drive

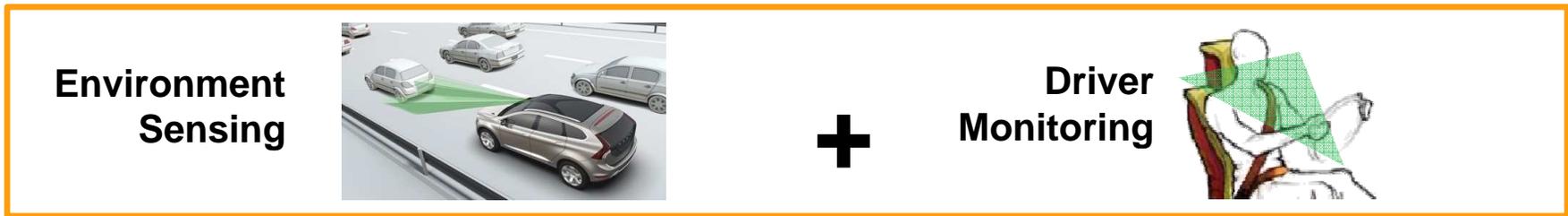


Source: Auto BILD, Fahrerassistenzsysteme, 16.05.2011

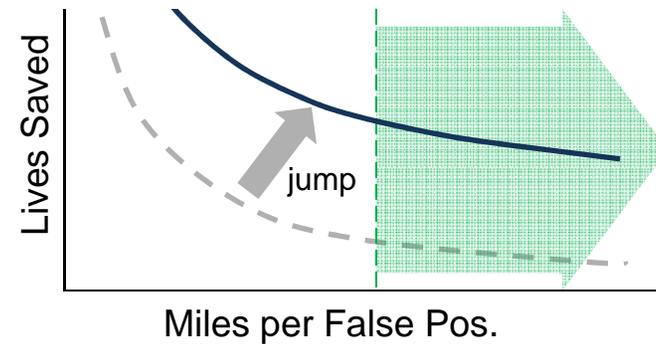
Safety: The Basis for the Introduction of Advanced Technologies



Autonomous Emergency Braking with Driver Awareness



- › Info on driver allows  false positives
- › Safety effectiveness can be 



Road Departure Protection



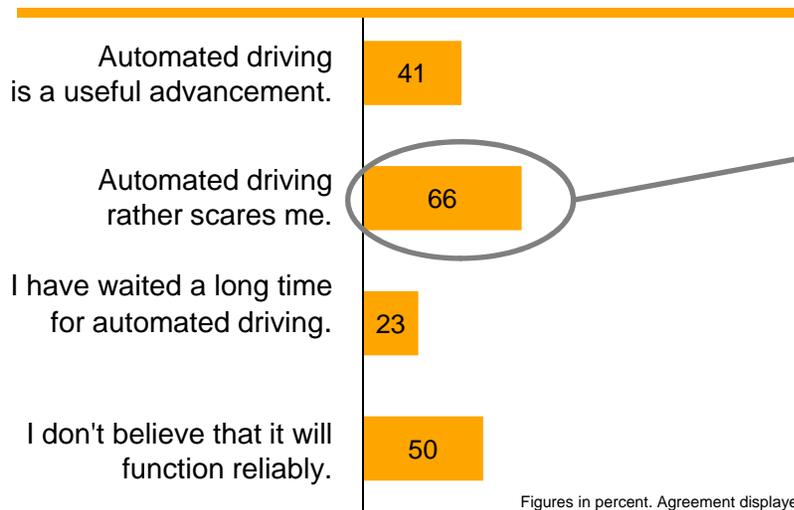
Road Departures right & left
account for approx
50% of fatalities

- › Prevents Road Departures
- › More authority than Lane Keeping systems
- › Low cost: uses standard and high volume technologies like Mono Camera & Electronic Stability Control

Continental Mobility Study

Attitudes toward Automated Driving

Question: ...Are you more inclined to agree with these or more inclined to object to these?



66% are rather scared

This calls for a step-by-step approach to build trust

53% of American drivers and 65% of Chinese drivers believe that automated driving will be a part of normal everyday driving in the next 10-15 years.

Levels of Automated Driving

Evolution of AD driving functions



The Safety Basics

If a car assists you, or drives you automatically, it must



Sense its environment
& vehicle's current state...



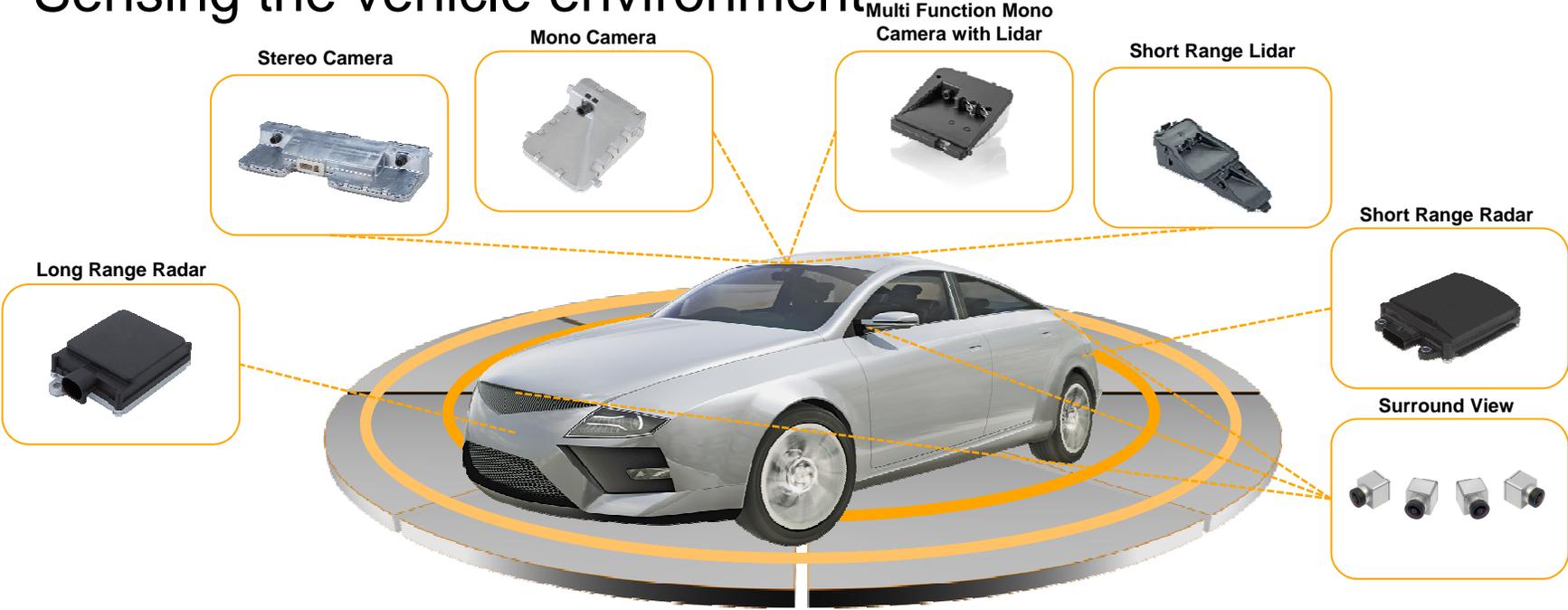
Plan its actions...



Act using the car's
actuators and control systems!

Advanced Driver Assistance Systems ADAS

Sensing the vehicle environment



Dynamic eHorizon

A key enabler for more safety, comfort and efficiency



Mobility of the Future: Automated Driving

- › Automated driving will be a key element of future mobility
- › Automation will decrease number of road traffic casualties
- › Drivers will use time more efficiently
- › Our path to automated driving is defined by 3 major milestones:

2016 - 2020 - >2025



Safe and Dynamic Driving towards **VISION ZERO**

Thank you
for your attention!

ZERO ACCIDENTS
ZERO INJURIES
ZERO FATALITIES

