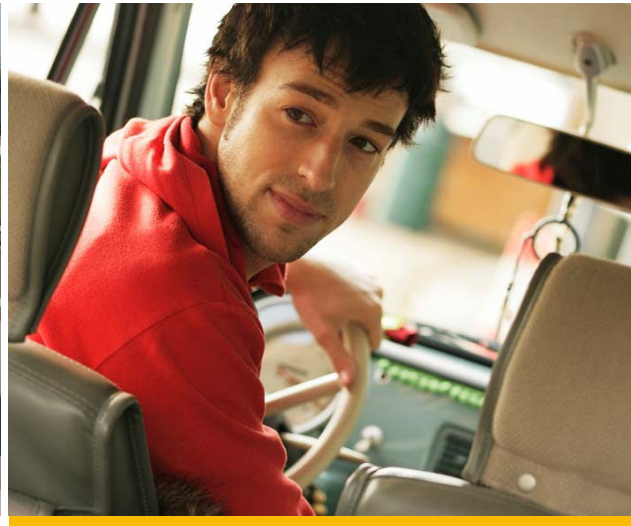


Verkehrsmanagement - VM



Aktive Sicherheit - AS



Cooperative Cars - CoCar



AKTIV – experiencing the future together

Dr. Ulrich Kreßel

Daimler AG, Research Center Ulm

Walter Schwertberger

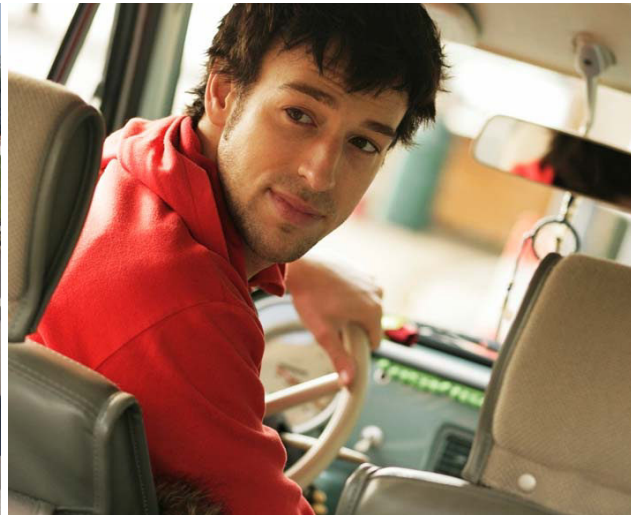
MAN Nutzfahrzeuge, München

Verkehrsmanagement - VM



Traffic

Aktive Sicherheit - AS



Vehicle

Cooperative Cars - CoCar



Communication

German research initiative AKTIV:

Adaptive and Cooperative Technologies for Intelligent Traffic




Development of assistance systems

- to increase **traffic safety** by
- reducing road traffic accidents,
- easing the driver's load and
- improving safety for vulnerable road users
- based on robust **perception** of the driving environment
- and considering the driver and his **awareness**



Budget, Funding, Time Schedule



- Duration 01.09.2006 – 31.08.2010
- Total Budget nearly 60 Mio. € (37 Mio. € for Active Safety)
- Funding about 27 Mio. € (15 Mio. € for Active Safety)
- Supported by the  Federal Ministry of Economics and Technology
- Milestones presentation 25.06.2008 at BAST in Bergisch Gladbach



Active Safety Partners



- Audi • BMW • Daimler • Ford • Opel • MAN • VW
- Bosch • Continental • Ericsson • Ibeo • VDO-Automotive
- ifak Magdeburg • Uni Hannover • Uni Kassel • TU München • Hochschule Saarland
- Allianz • DDG • PTV • Teleatlas • TRANSVER • Vodafone
- BAST • Verkehrszentrale Hessen



Active Safety Project Structure



Active Hazard Braking



Intersection Assistance



Integrated Lateral Assistance

Driver Awareness and Safety

Pedestrian and Cyclist Safety



Key Findings of „100 Car Naturalistic Driving Study“ Concerning Driver Inattention (Virginia Tech / NHTSA, 2006)

Facts:

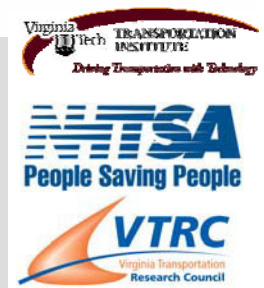
- 241 drivers
- approx. 2.000.000 miles of driving
- 82 crashes / 761 near-crashes
- 8.295 incidents

Findings:

- involvement of driver inattention within 3 seconds to onset of conflict:
nearly 80% of all crashes and 65% of all near-crashes
- driver drowsiness as a contributing factor:
in 20% of all crashes and 16% of all near crashes

Consequences:

- detection of inattention allows for better warning and intervention systems
- reduction of inattention allows for reduction of crash risk





Horizontal project with the objectives of

Monitoring driver awareness

- by detection of driver behavior
- by detection of line of sight and position of head
- prototypic presentation und comparison



Consideration of awareness for driver assistance systems

- integration of driver awareness in warning and interfering concepts of the applications
- methods to enhance driver awareness

Test methods in the process of development

- test methods for usability & controllability for driving simulator and field
- development tools for testing sensor systems

General conditions and consequences of use

- long-term effects of assistance systems on traffic safety
- analysis of effects and benefits based on accident studies
- legal aspects regarding liability and introduction of assistance systems



Active Hazard Braking



Objective:

Collision avoidance and mitigation by ***automatic hazard braking***

- adapted to the situation
- consideration of the driver awareness

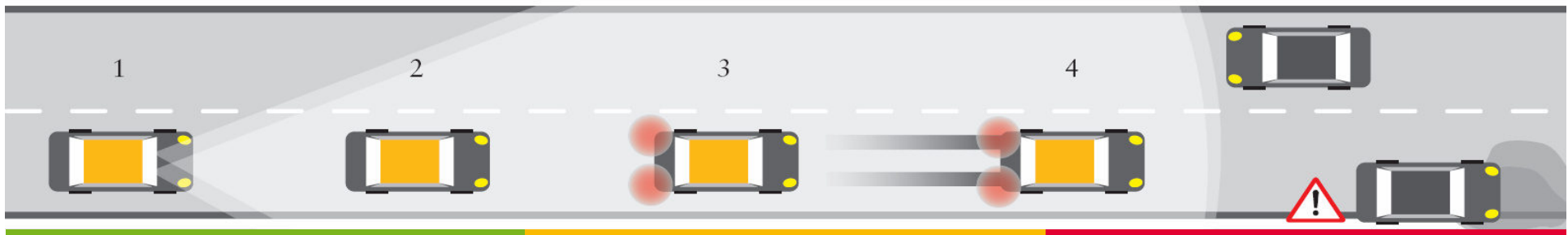


Base:

- significant improvement of the detection accuracy
- adaption of the system interaction to the driving situation
- verification of the system decision by perception driver reaction

Improvement:

- system performance superior to existing emergency brakes
- risk of a wrong system decision will be significantly reduced





Objective:

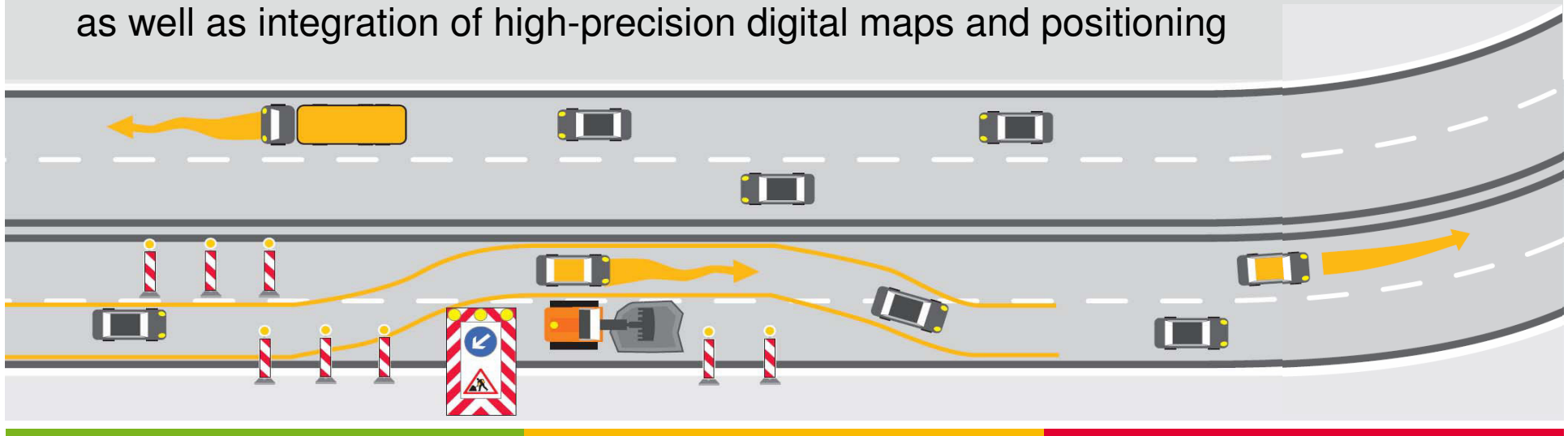
Continuous lateral guidance

in the full speed range from 0 to 150 km/h

- during lane keeping in straights and curves
- by taking into account objects in the driving environment
- with high availability also in congested traffic and within construction zones

Base:

Detection of driving environment with high performance front oriented sensors as well as integration of high-precision digital maps and positioning





Objective:

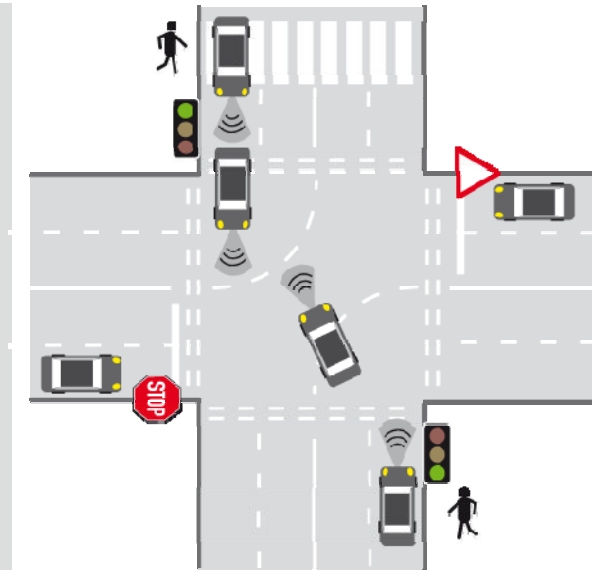
Enhancement of safety at *intersections* by avoiding driver failures and critical manoeuvres

Support of the driver

- during turning and entering
- while crossing the intersection
- to keep the adequate distance to the preceding vehicle

Base:

- onboard sensing systems (radar, lidar, camera)
- cooperative sensors such as V2V communication
- integration of positioning and digital maps
- comprehensive situation analysis





Objective:

Enhancement of safety for **vulnerable road users**

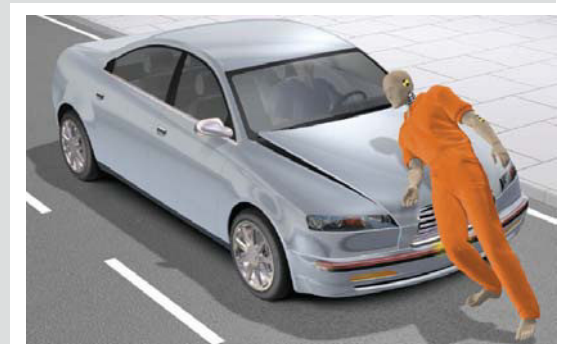
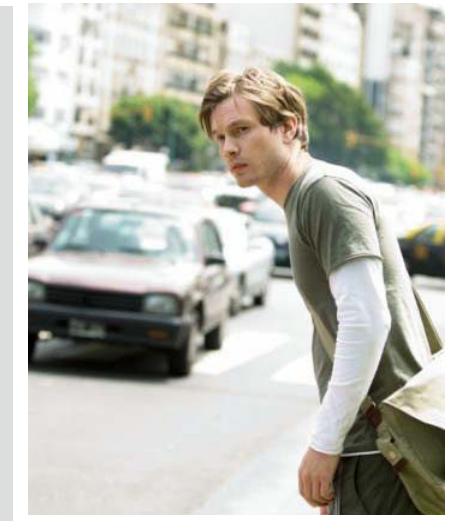
Development of active means for protection:

- driver warning (acoustic, optic and tactile)
- warning the environment (horn)
- active intervention in braking and steering
- active protection mechanisms (tilting hoods)

Big **challenge** for sensor systems (video, lidar, radar)

- high diversity of appearance in complex traffic environment
- high processing speed and robust environment detection
- adaptive situation analysis

Development of strategies to avoid accidents
and to soften impacts.

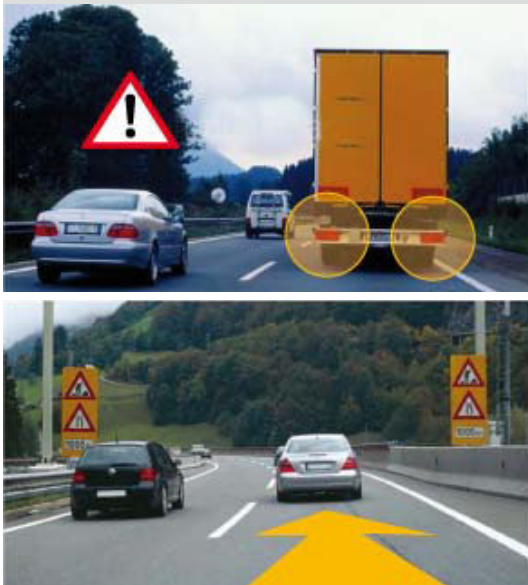




Active Safety Project



Active
Hazard Braking



Integrated Lateral
Assistance



Driver Awareness
and Safety

Intersection
Assistance



Pedestrian and
Cyclist Safety

AKTIV – experiencing the future together:

www.aktiv-online.org

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