Driver Assistance Systems – Status Quo and Future Impact on PTI
Preliminary Findings of the vFSS-Group

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State of the art

- Adaptive headlight
- Lane change assistance
- Active speed limiter with Stop&Go, collision warning and soft braking function
- Night Vision with pedestrian detection
- Night Vision with pedestrian detection
- Rear camera
- Side View
- Top-View
- Head-Up Display
- Lane departure warning
- Speed-Limit-Info
Nomenclature and Members

vFSS – Advanced Forward-Looking Safety Systems
Focus: M1-Vehicles
The aim of the Working Group is the development of test procedures for driver assistance systems (in particular advanced emergency braking systems) in order to ensure a **robust assessment** of such systems.

Focus on **traffic accident priorities** by means of an evaluation of the effectiveness in real world accidents, with the aim of reducing the number of road traffic casualties.

Ensure transparency with respect to legal requirements and consumer protection initiatives, incorporating harmonisation principles and accounting for related trade offs.

Determination of a **harmonised methodology** for effective evaluation.

Incorporation of conclusions into P-Safe and Euro NCAP working groups in a first step. Establishment of strategic alliances within other NCAP markets.

3 work packages:

- **Pedestrian safety**
- **Accident analyses**
- **Longitudinal traffic safety systems**
vFSS Group Workpackages

- **WP1 Accident Analyses**
  - Worldwide monitoring of activities (e.g. Beyond NCAP, AEB-Group)
  - Accident research
  - Effective range analysis for pedestrian safety systems
  - Effective range analysis for longitudinal traffic safety systems
  - Accident scenario definition contributing to casualty reduction and injury mitigation
  - Derivation of scenarios contributing to material damage reduction
  - Development of an assessment scale for material damage weighting and personal damage (fatally injured/severely injured) weighting related to M1-vehicles

- **WP2 Pedestrian Safety**
  - Evaluation of the technical feasibility defined in WP1
  - Assessment of system limits
  - Generation and collection of pedestrian safety testing methods

- **WP3 Longitudinal Traffic Safety Systems**
  - Evaluation of the technical feasibility defined in WP1
  - Assessment of system limits
  - Generation and collection of longitudinal traffic safety systems testing methods
Longitudinal Traffic Safety Systems
WP3 Longitudinal Traffic Safety Systems

Test Procedure and Target Evaluation
WP3 Longitudinal Traffic Safety Systems - Target
Background and History of Test Procedure Development

Overall Focus of vFSS-working group 3:

- longitudinal crash scenarios
- Development requirements for crash-targets
- Development of test-procedures for autonomous and adaptive braking systems
Test Procedure Development

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Bremsen BMW
Braking or steering
Pedestrian Safety
Transferring accident scenarios to test scenarios

**S1**
- pedestrian not obstructed

**S2**
- ped. not obstr.

**S3**
- S5
- ped. obstructed

**S4**
- Boundary conditions:
  - system is working symmetric
  - variation of size$_{Ped}$, speed$_{Ped}$, TTC
  - obstruction possible

**S6 excluded**
- Easy to detect
- High speed (> 70 km/h)

**TS1**
- running child from the right

**TS2**
- walking adult from the right

**TS3**
- running child from the right

**TS4**
- walking adult from the right

S – Accident Scenario
TS – Test Scenario
Transformation to Laboratory Test

**Principle**
- moving vehicle
- moving dummy target
- perpendicular moving directions
- continuous velocity measuring for vehicle and dummy target

**Relevant values**
- vehicle velocity at point of first visibility of the dummy target ($P_{Vis\_Veh}$)
- vehicle velocity at the collision point ($P_{Coll}$)
- vehicle’s speed reduction is the relevant value to assess the system performance

**Testing**
- 4 different test scenarios
- 10 test cycles for each scenario
Possible Test Rig
Interlink with EC-Projects

Assessment of Integrated Vehicle Safety Systems for improved vehicle safety

Institutions and Companies involved:

- HUMANETICS
- Bosch
- TEC - Knowledge for business
- Daimler
- bast
- Federal Highway Research Institute
- TRL
- CHalmers
- PSA Peugeot Citroën
- Applus
- IDIADA
- TRW
- Vehicles
- University of Cologne
- ICREA
- Toyota
- Allianz
Interlink with EC-Projects

Assessment methodologies for forward looking Integrated Pedestrian and further extension to Cyclist Safety Systems
Memorandum of Cooperation NHTSA-BAST

Signed 26 April 2010
Impact on PTI

- Safety must be kept on an appropriate level
- Therefore ensure that vehicles on the roads are maintained to a high degree of technical roadworthiness
- Increasingly complex and dynamic functionality of vehicle systems
- Critical safety systems that only operate when the vehicle is in motion such as ESC or AEBs
- Real testing of safety systems within PTI not feasible (time & costs)
Requirements

- Procedure: VIN specific safety system data delivered by OEM
- Fitment test of safety system
- Functional test based on OBD system data
Thank you very much for your attention

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