

19th ESV Conference

„The Evolution of Automobile Safety from Experimental to Enhanced Safety Vehicles: A Look at Over 30 Years of Progress“

„Future Research Directions for Enhancing Safety“

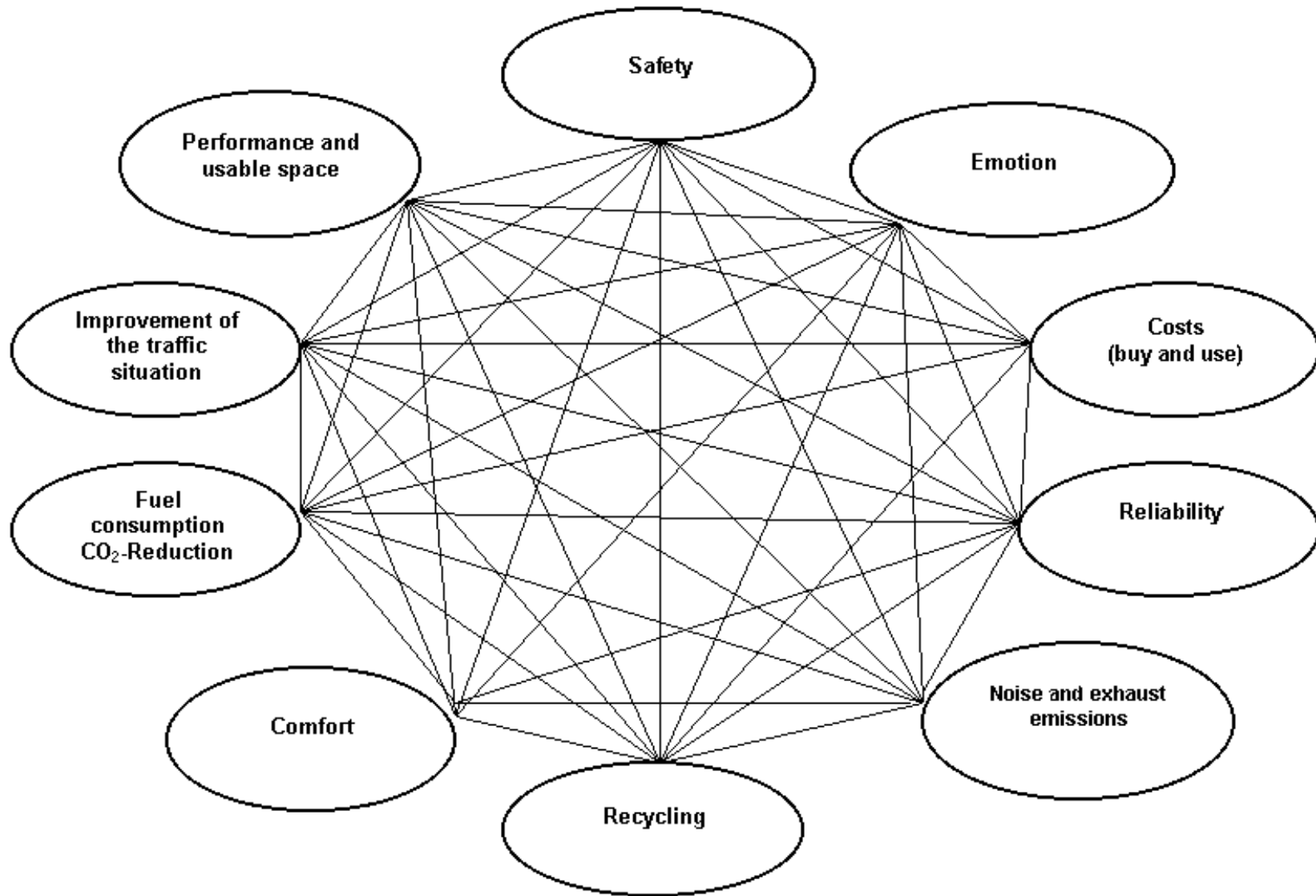
Prof. Dr.-Ing. Ulrich Seiffert

Technical University of Braunschweig, Germany

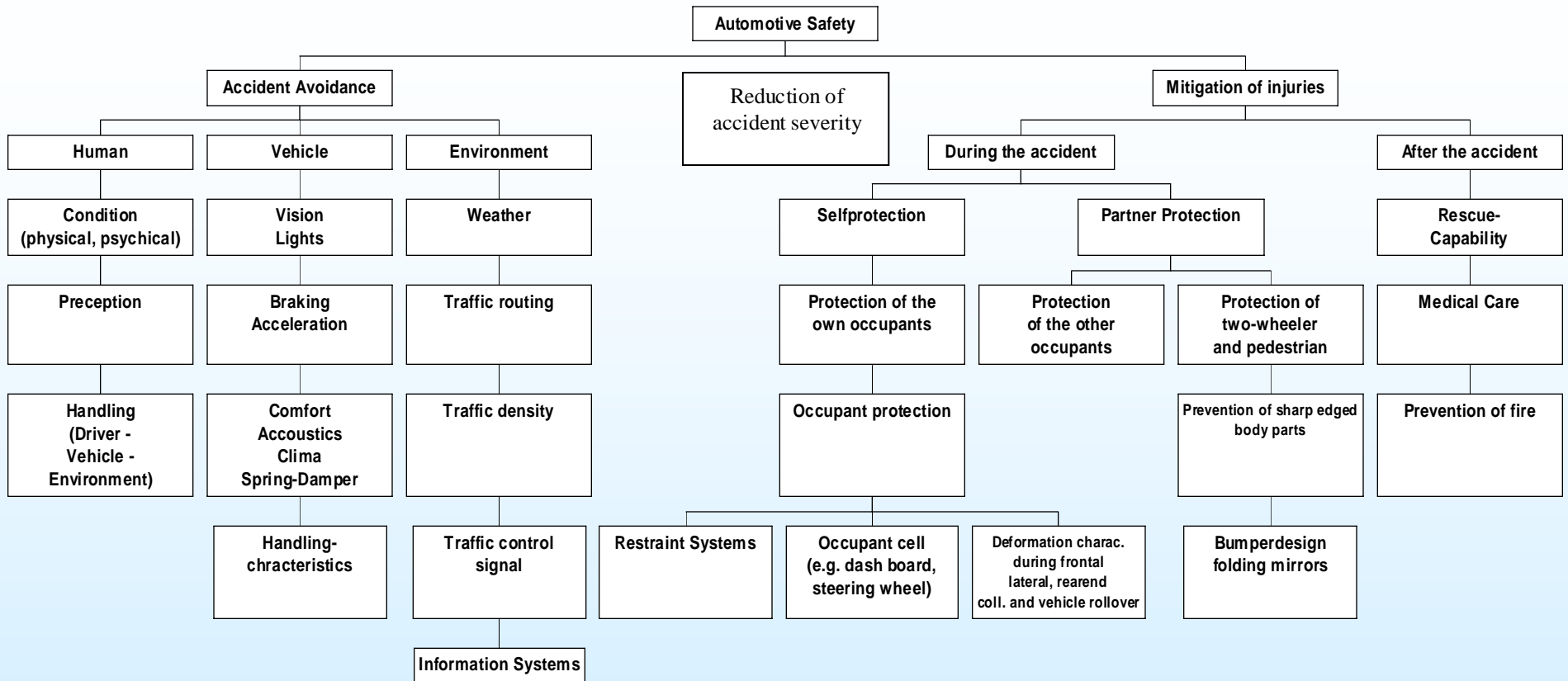
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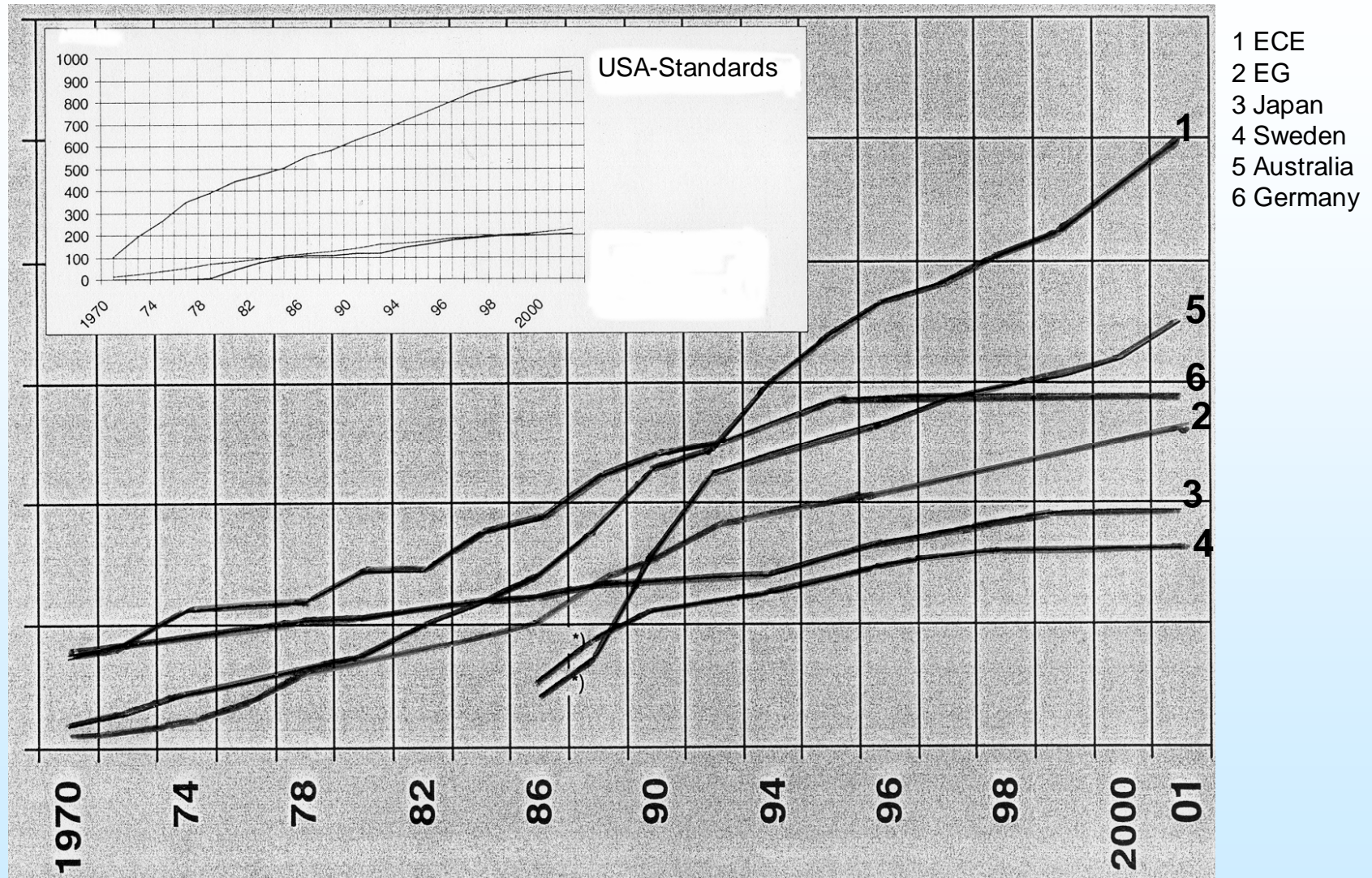
Conflicting Demands by Vehicle Buyers



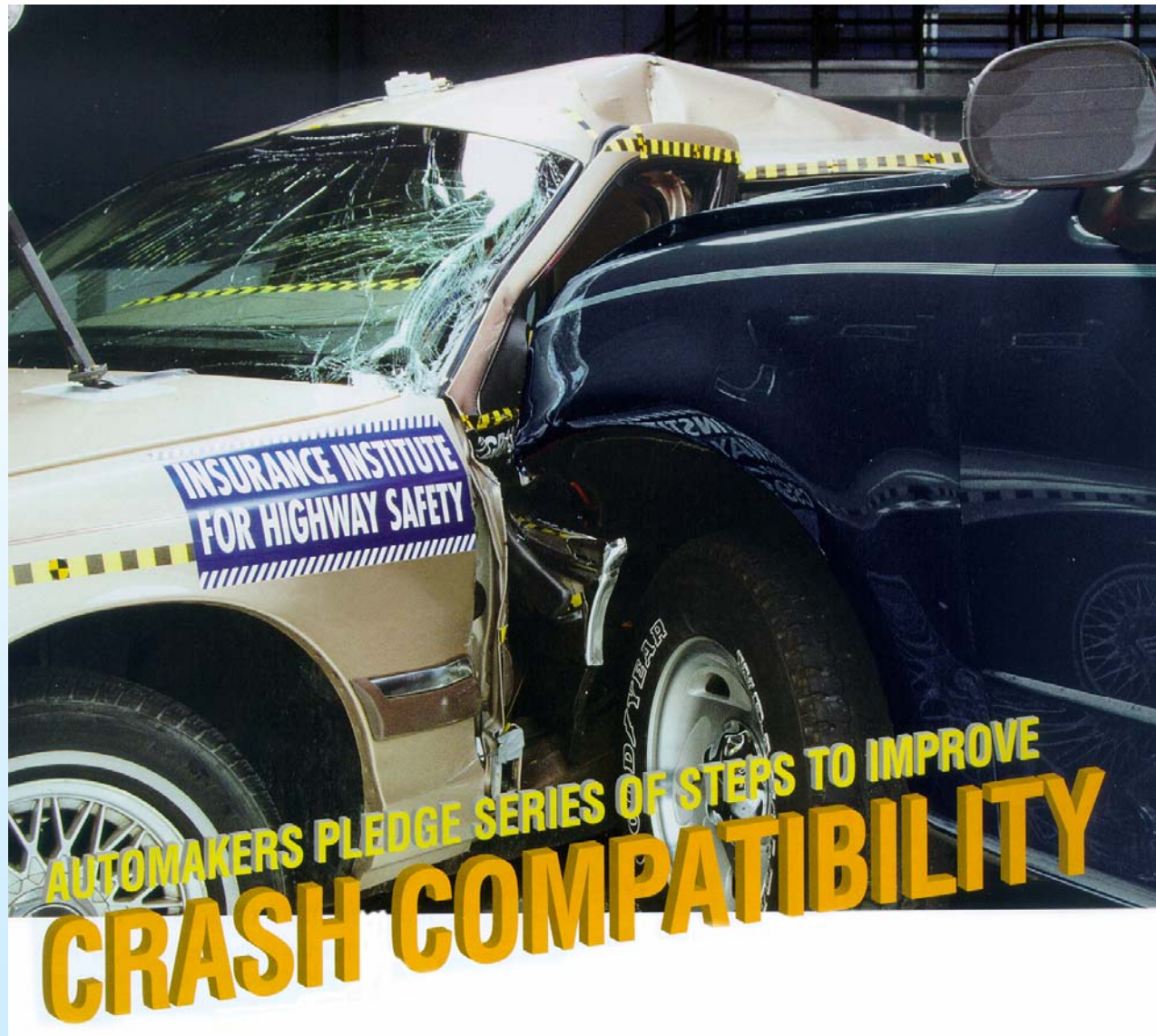
Automotive Safety



Number of Rules for Vehicles in Various Countries [1]



Public Information by Insurance Institute for Highway Safety [9]

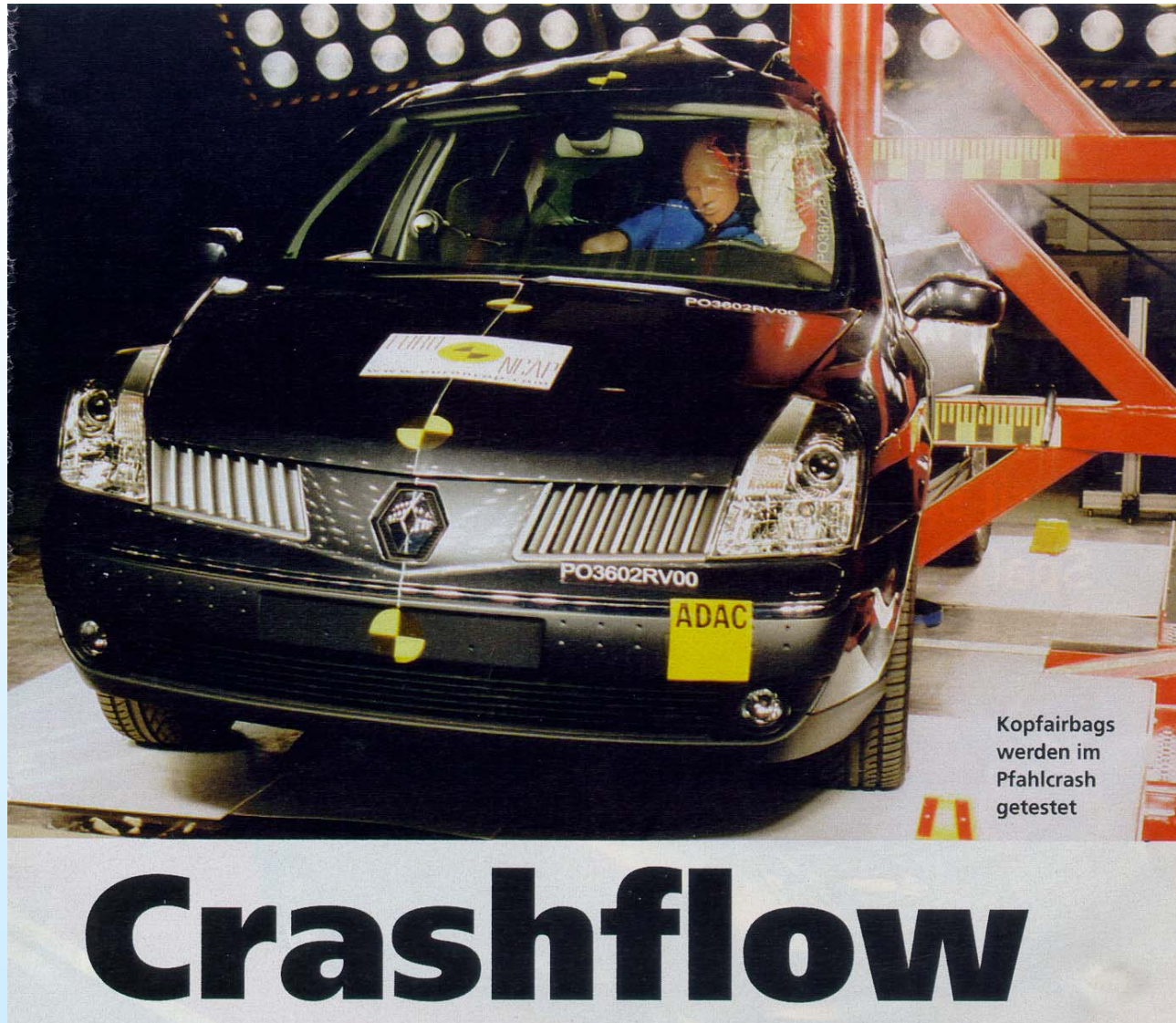


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- 5 -

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Crash Test Published by German Magazine [2]

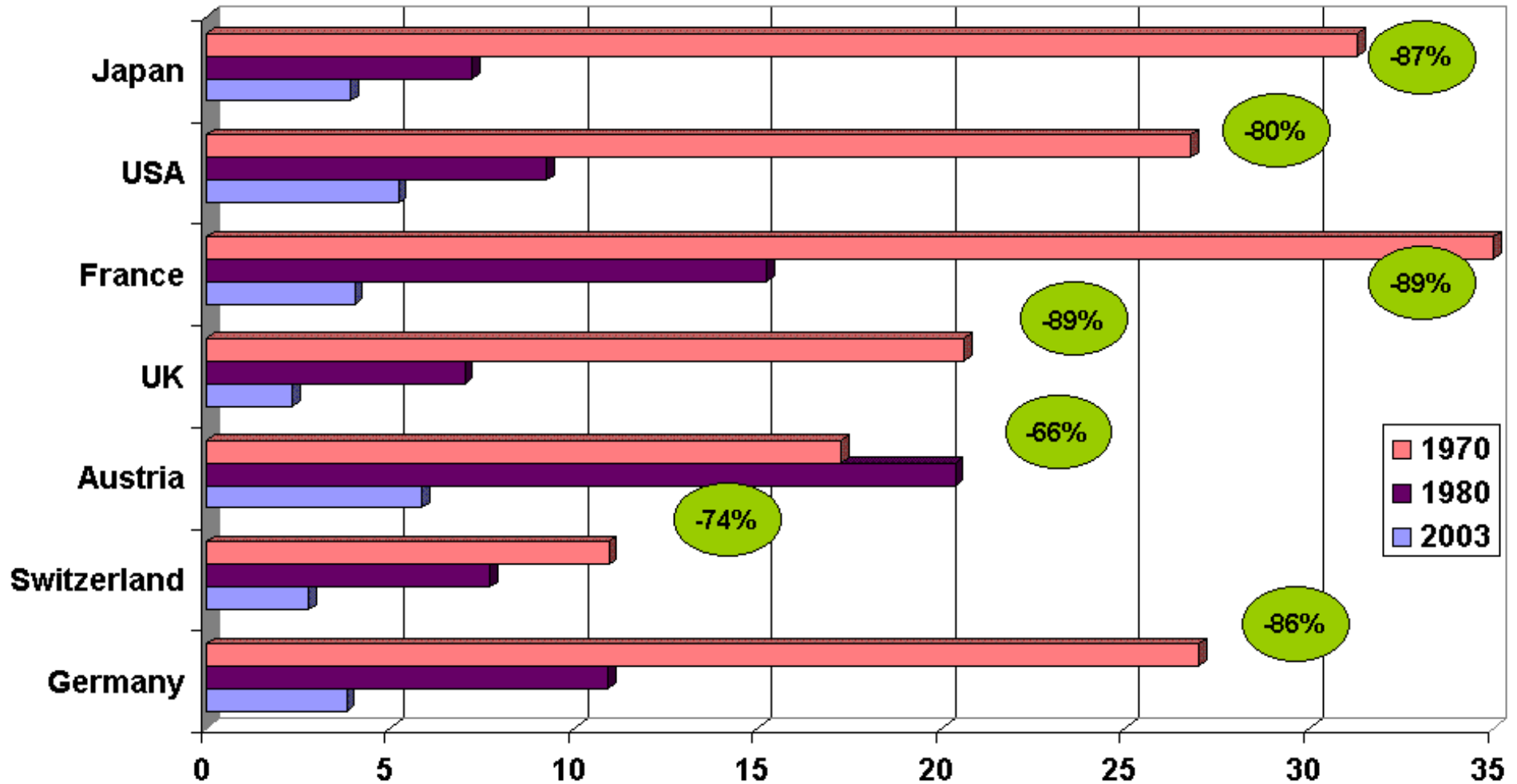


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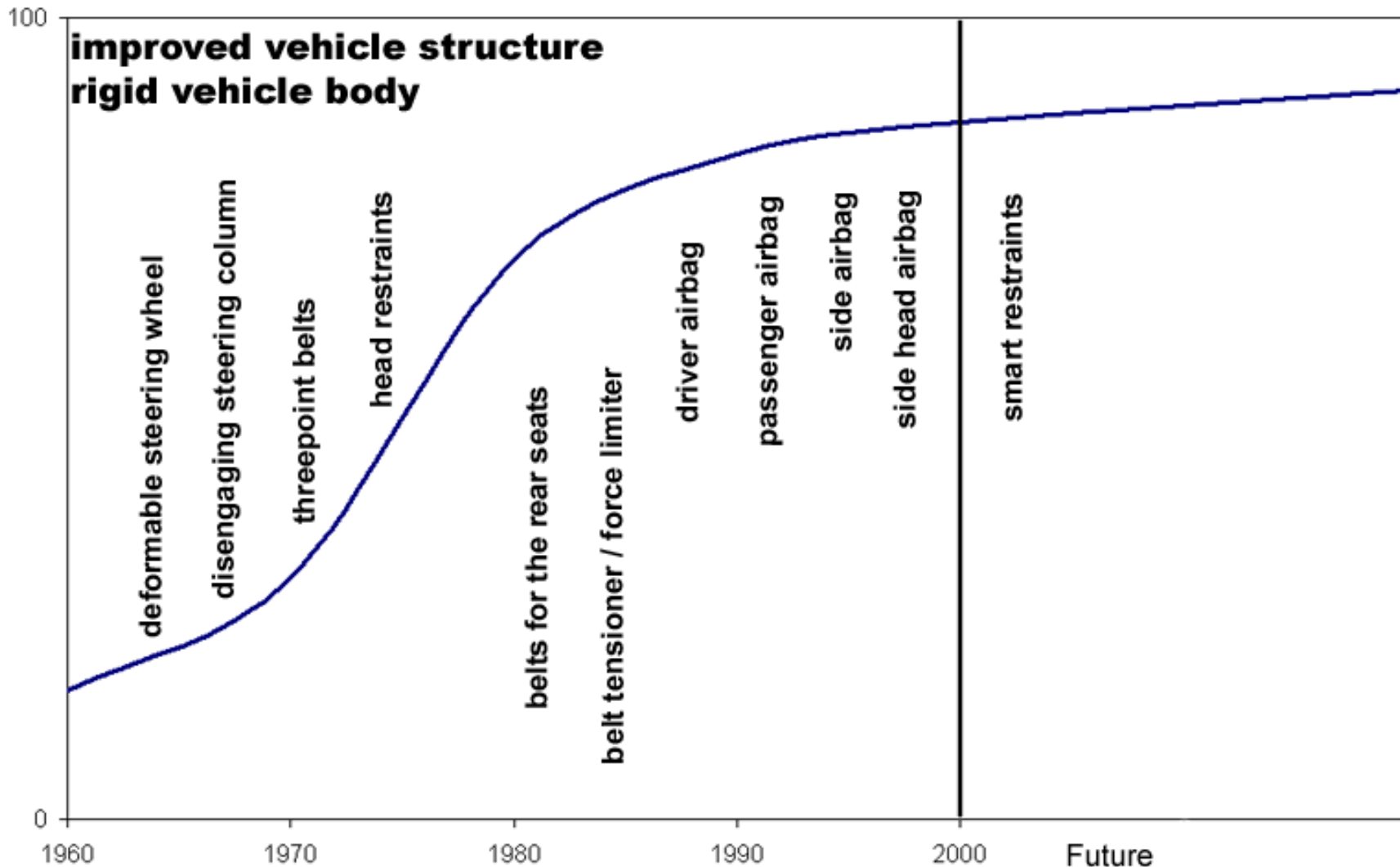
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Fatalities per Billion Vehicle-km Driven on Highways, Source: IRTAD



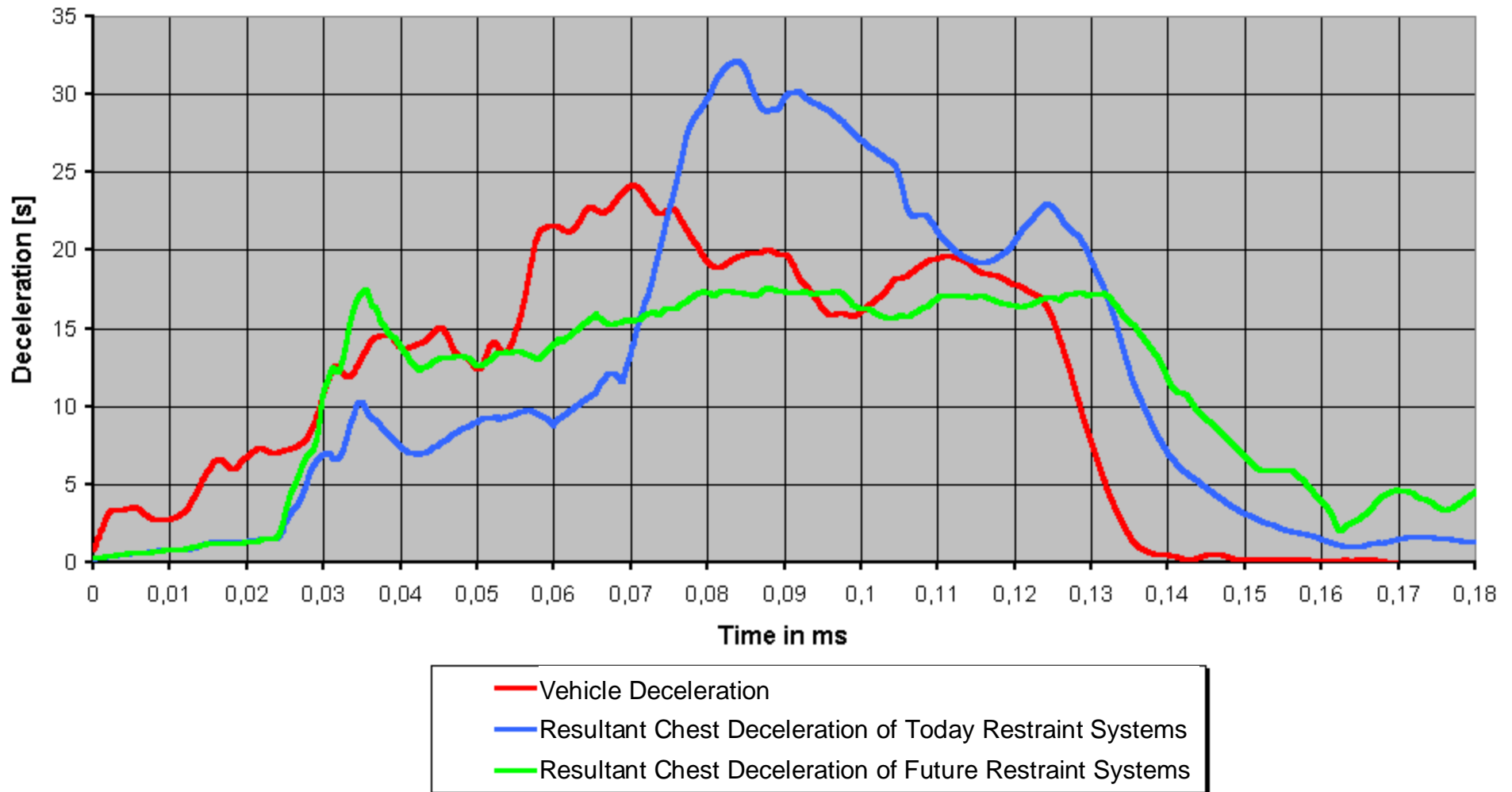
Progress in the Field of Mitigation of Injuries



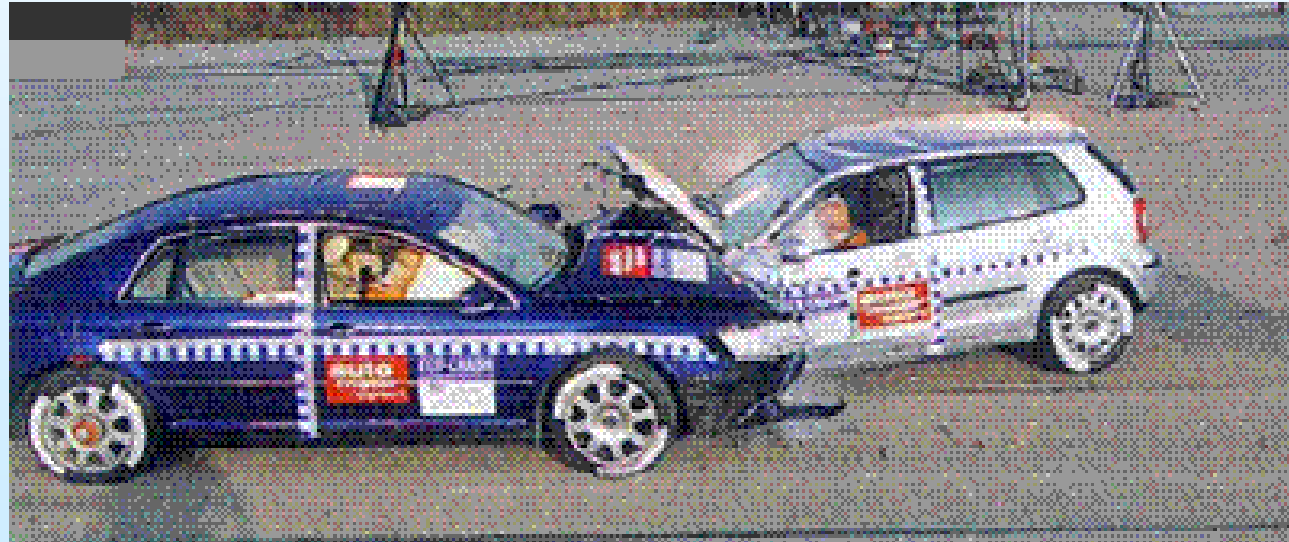
Further Improvements in the Field of Mitigation of Injuries

- ⇒ Adaptive Restraint Systems
- ⇒ Compatibility
- ⇒ Pedestrian Safety
- ⇒ Rollover Protection
- ⇒ Fuel System Integrity
- ⇒ Emergency Call After a Severe Accident

Advanced Restraint Systems in a 64 km/h Euro NCAP Test [3]



Off-Set Crash Between a Volkswagen Phaeton and Volkswagen Polo

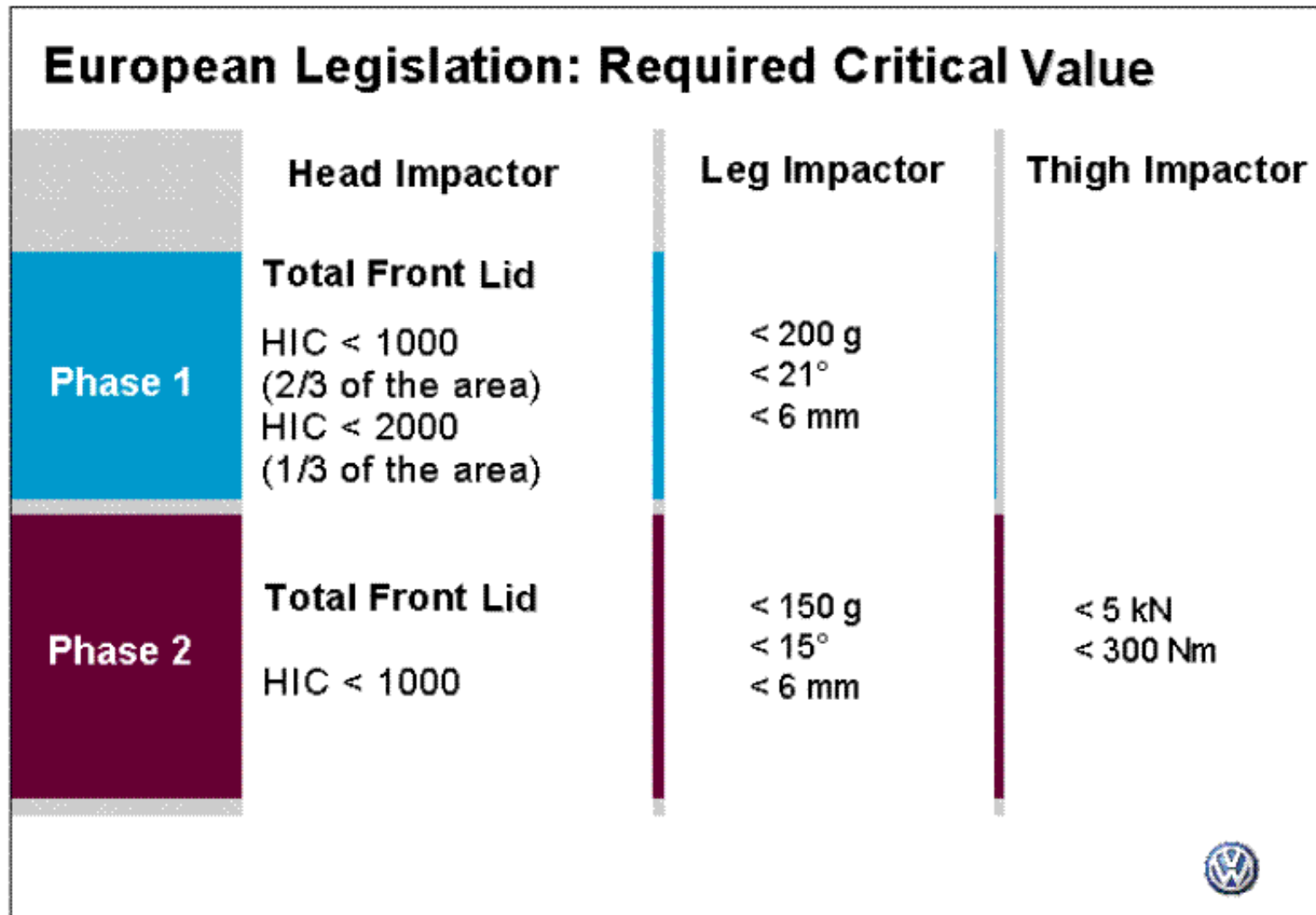


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Items for Compatibility Research

- ⇒ Occupant-Cell Integrity
- ⇒ Geometrical Match Between Cars and SUV's and LTV's
- ⇒ Restraint-System Layout
- ⇒ Defined Energy Absorption Capability for Heavier Cars in a Car to Car Collision

Requirements for Pedestrian Protection in Europe [4]



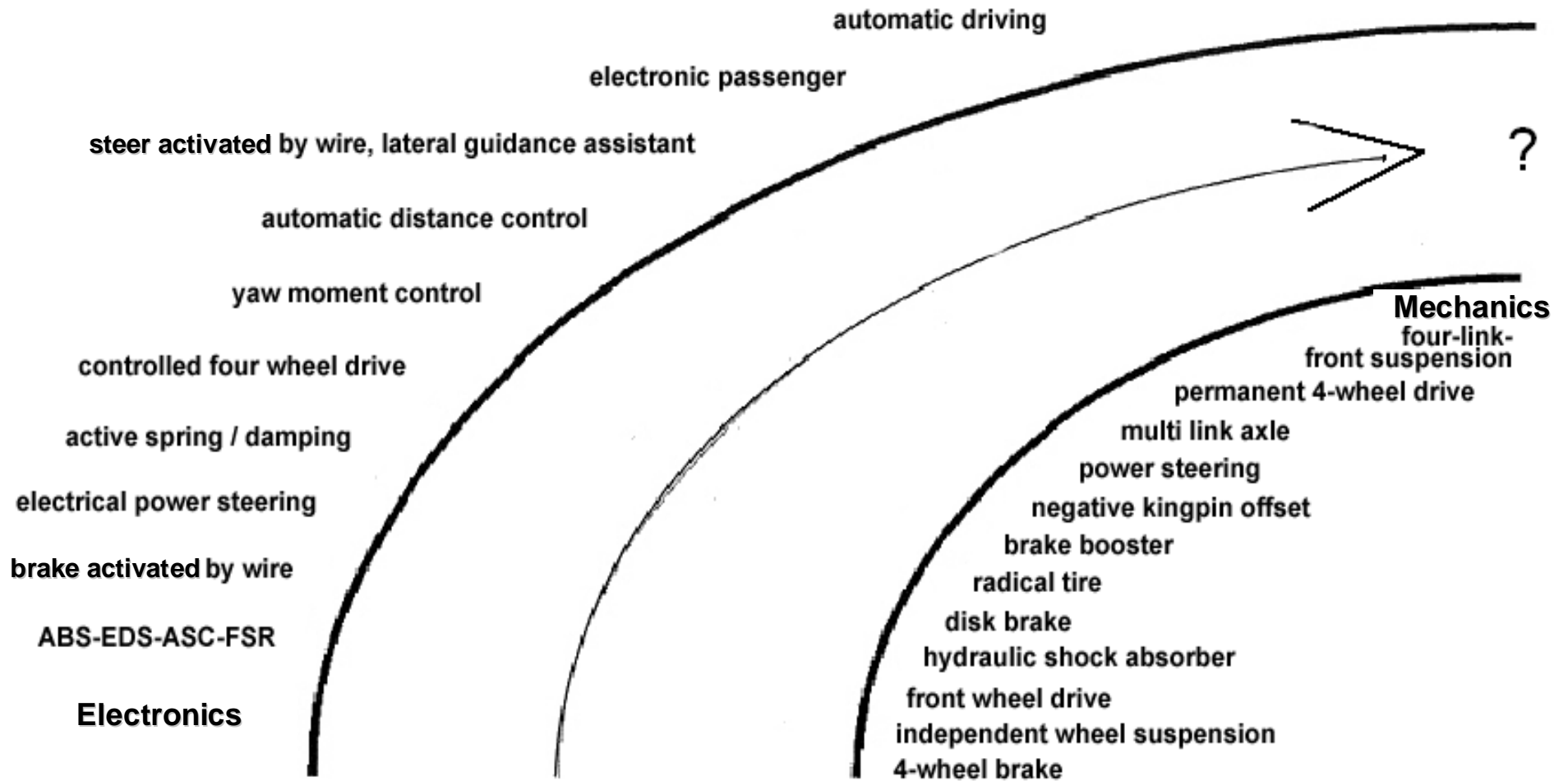
Future Rollover Protection Items

- ⇒ Roll Over Prevention
- ⇒ Avoid that the Occupant Heads Leave the Vehicle Interior

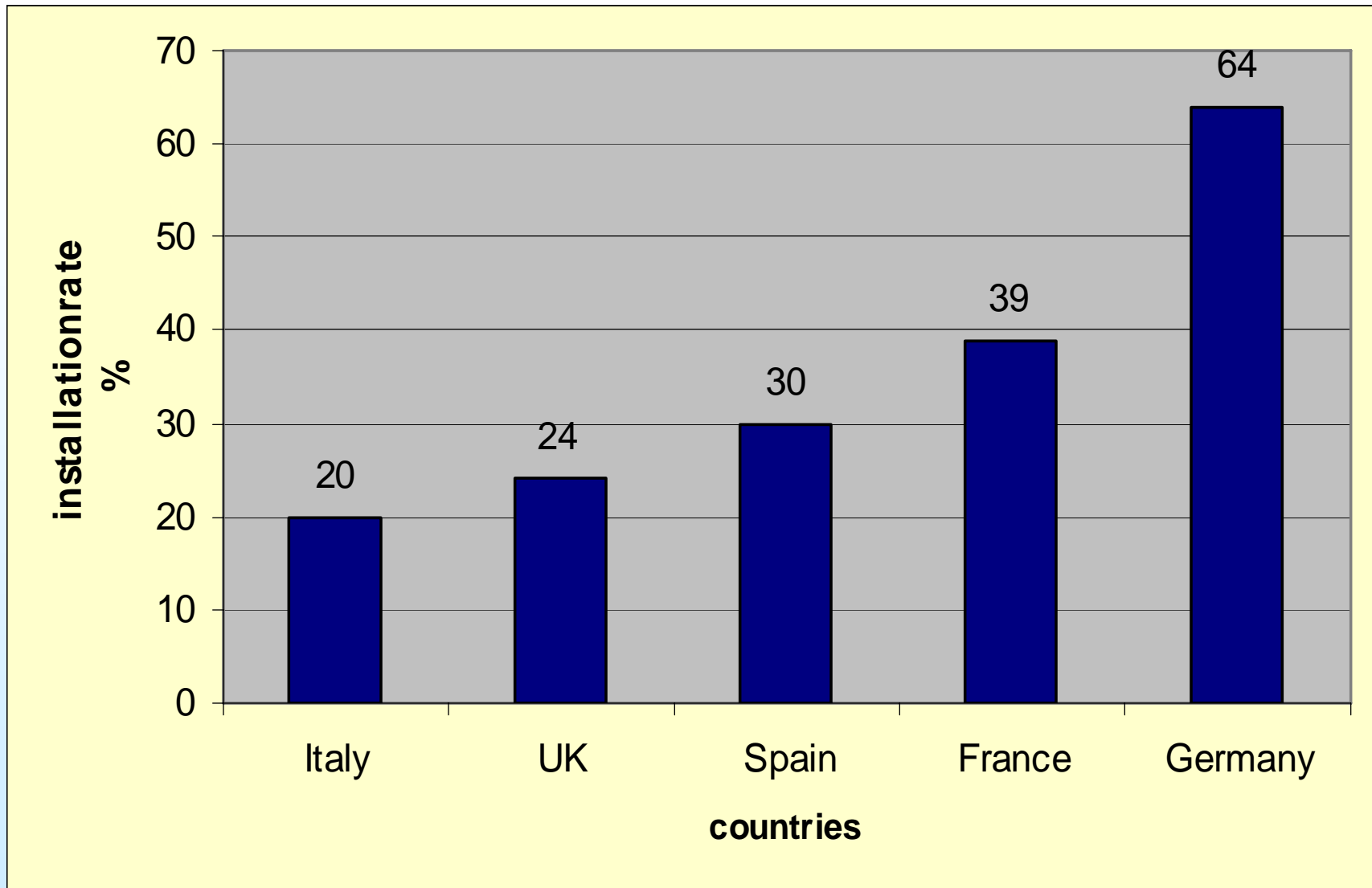
Increased Efficiency in Automotive Legislation

- ⇒ Revise Standard FMVSS 201
- ⇒ Revise Standard FMVSS 204
- ⇒ Revise Standard FMVSS 208
- ⇒ Increase the World Wide Harmonization Efforts in the Fields of Compatibility and Pedestrian Protection
- ⇒ Redefine the work of the Standard Harmonizing Groups, which did not have achieved positive results

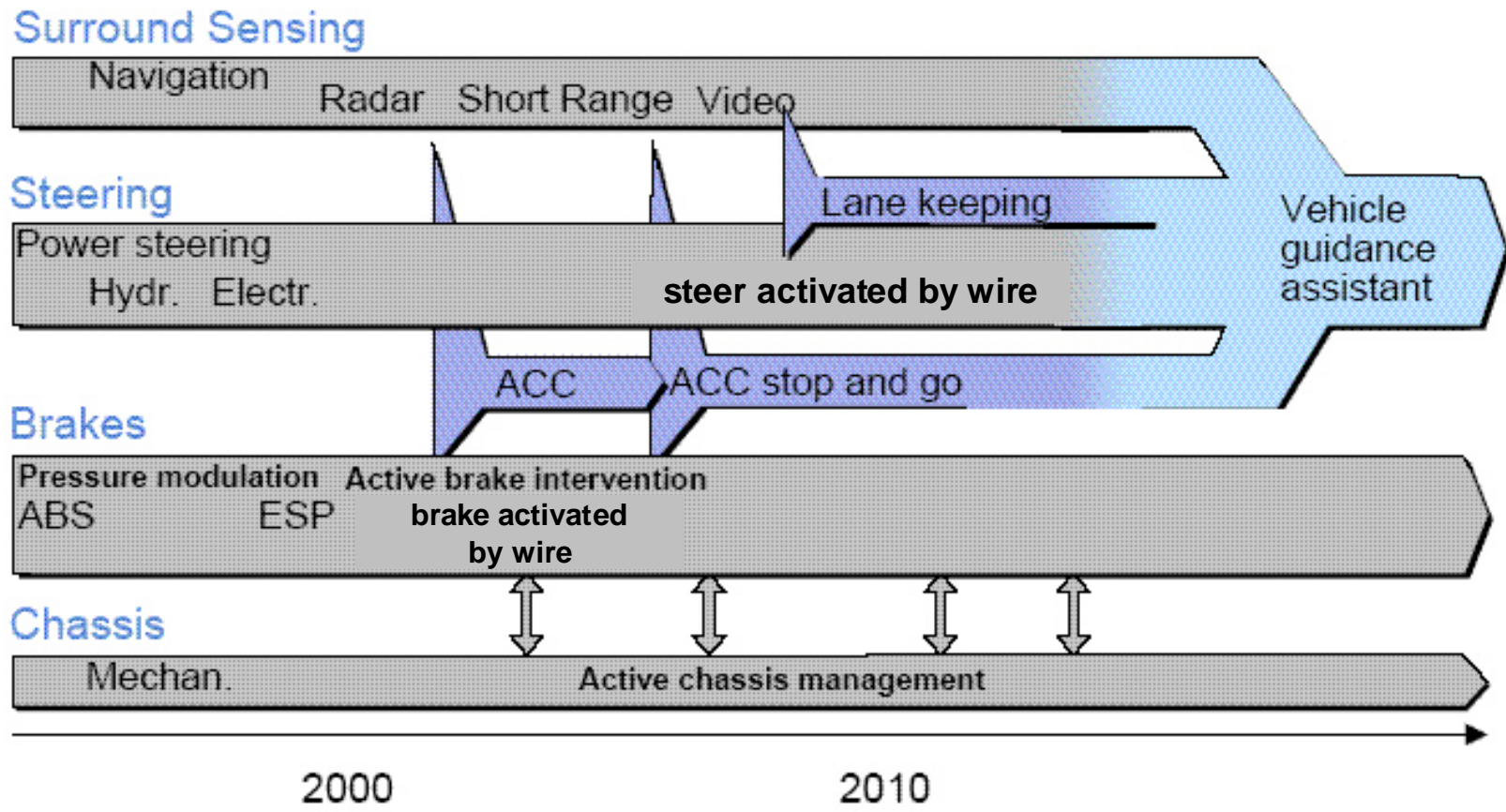
Measures in the Field of Accident Avoidance



ESP-Installation Rate in Europe [5]



Vehicle Dynamics and Driver Assistance [6]*



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Driver Support Systems

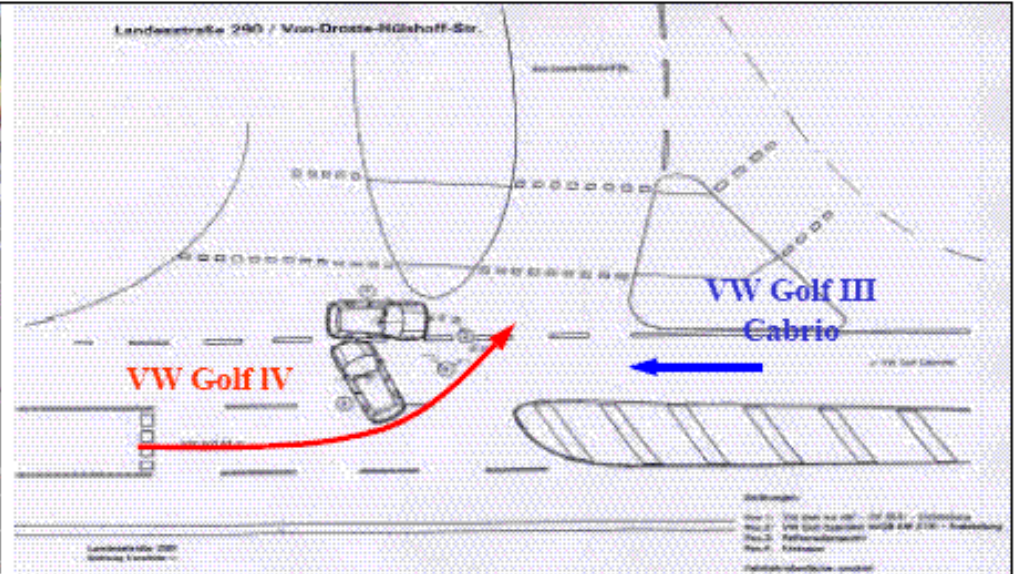
of 2005

- ⇒ Dynamic Curve Light
- ⇒ Distance Warning
- ⇒ ACC with Automatic Braking
- ⇒ Adaptive Brake Light
- ⇒ ABS
- ⇒ Brake Assist System BAS
- ⇒ ESP + Advanced ESP
- ⇒ Lane Departure Warning Device

for the Future

- ⇒ Automatic Emergency Brake
- ⇒ Front Obstacle Identification, incl. Pedestrians
- ⇒ Avoidance of Blind Spots
- ⇒ Anti Drowsiness
- ⇒ Car to Car Communication
- ⇒ New Communication Systems in the Traffic Environment

Accident Investigation by Volkswagen [7]



Documentation

Reconstruction

Analysis

Bibliography

- [1] Volkswagen AG, Wolfsburg, Germany.
- [2] Auto Motor Sport, Germany.
- [3] Schwant, W.: German patent application 102004029456.9
- [4] Strutz, T. et al.: Frontendgestaltung für den passiven Fußgängerschutz. Braunschweig, ISBN: 937655-03-4.
- [5] VDI-Nachrichten No.7, February-15-2005, Düsseldorf, Germany.
- [6] Bohr, B.: Electronics as a driver of Innovation, 8. Virtual Product Creation Conference, ATZ/MTZ – 2004 Stuttgart.
- [7] Zobel, R.; Schwarz, T.: Ergebnisse aus der Unfallforschung "Handbuch der Kfz-Technik, 3. Auflage, ISBN-Nr. 3-528-23114-9, Vieweg-Verlag, Wiesbaden.
- [8] Oakley, C.: Roadmap of Future Automotive Passive Safety Technology. Development, European Vehicle Passive Safety Network, TRL-UK, 2004.
- [9] Insurance Institut for Highway Safety, Volume 39, No.1, 2004.