




Euro NCAP
Status of Activities for Improved Occupant Protection



Dipl.-Ing. Bernd Lorenz
Head of Section Passive Vehicle Safety, Biomechanics

WebEx Meeting on 8th of September 2010


Federal Highway Research Institute
Bundesanstalt für Straßenwesen (BASt)

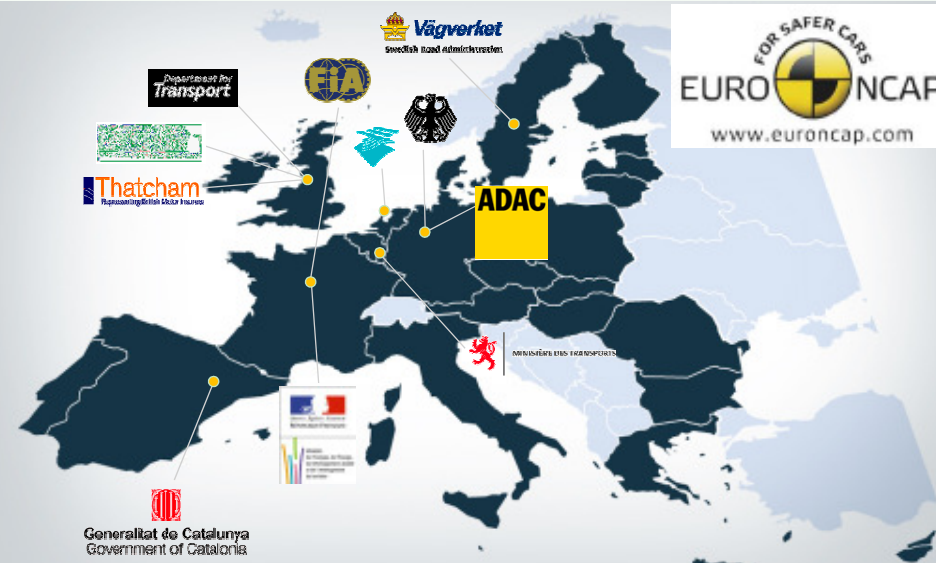


Content

- Background / Current Assessment
- Child Safety Working Group
- Road Map
- Summary


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Euro NCAP's Members 



Euro NCAP = European New Car Assessment Programme


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Euro NCAP's Members 




7 Governments
5 NGO's

- ADAC (Allgemeiner Deutscher Automobil Club)
- BMVBS (German MOT represented by BASt)
- DfT (Department for Transport, UK)
- Dutch Ministry of Transport (NL)
- *European Commission (no member !)*
- FIA Foundation (Federation International de L'automobile)
- Generalitat de Catalunya (ES)
- ICRT (International Consumer Research and Testing)
- Ministère de l'Équipement (F)
- SRA (Swedish Road Administration)
- Thatcham (representing British car insurers)
- Luxembourg (new member!)




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Euro NCAP Test Labs 

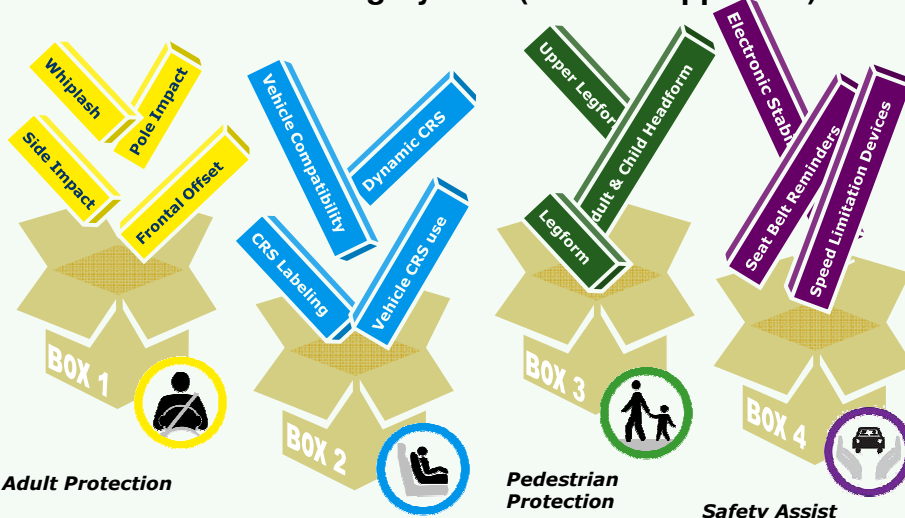
- TRL (Transport Research Laboratory, UK)
- TNO (The Netherlands)
- BASt (Federal Highway Research Institute, Germany)
- ADAC (Allgemeiner Deutscher Automobil Club, Germany)
- UTAC (France)
- IDIADA (Catalonia)
- Thatcham* (UK)

* Only Whiplash Tests

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Background / Current Assessment 

New Euro NCAP Rating System (4 Boxes Approach)



Box 1: Adult Protection (Icon: Person in car seat)

- Whiplash
- Pole Impact
- Side Impact
- Frontal Offset

Box 2: Child Protection (Icon: Child in car seat)

- Vehicle Compatibility
- Dynamic CRS
- CRS Labeling
- Vehicle CRS Use


Box 3: Pedestrian Protection (Icon: Pedestrian and child)

- Upper Legform
- Adult & Child Headform
- Legform

Box 4: Safety Assist (Icon: Car with hands)

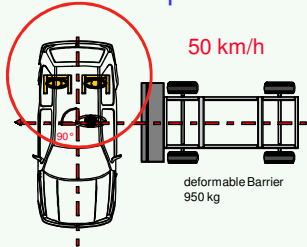
- Electronic Stability
- Seat Belt Reminders
- Speed Limitation Devices

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Background / Current Assessment 

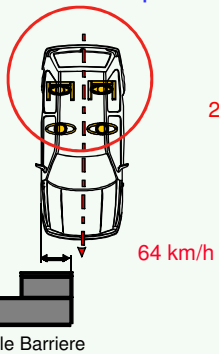
Crash Tests Euro NCAP

Side Impact



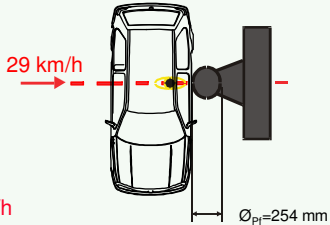
50 km/h
deformable Barrier
950 kg

Frontal Impact




64 km/h
40 % Offset
deformable Barriere


Pole Test

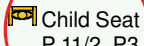



29 km/h
Ø_P=254 mm

Pedestrian Tests 


+ Whiplash

 ES-2

 Child Seat
P 11/2, P3


 Hybrid III

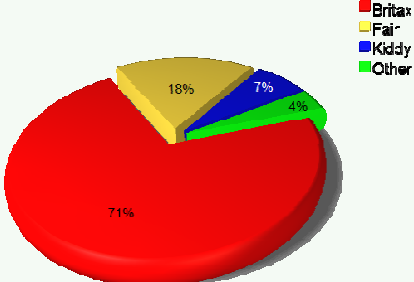
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Background / Current Assessment 

What seats are tested? (1)

- Total of 262 CRS assessments performed
- Only 11 different child seats were tested
- Dominated by Britax-Roemer product

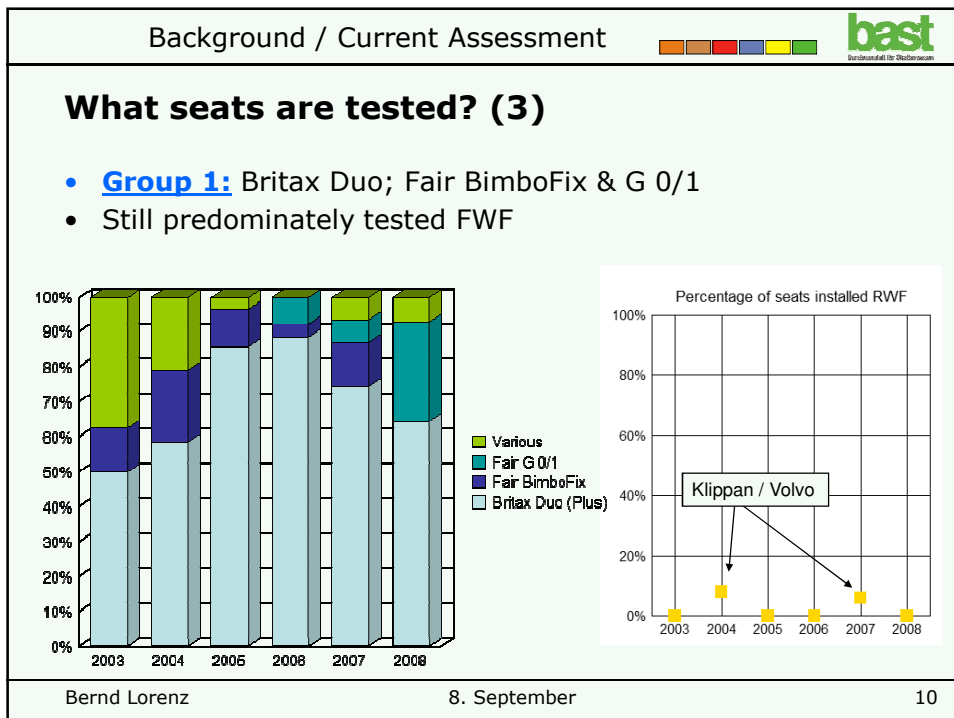
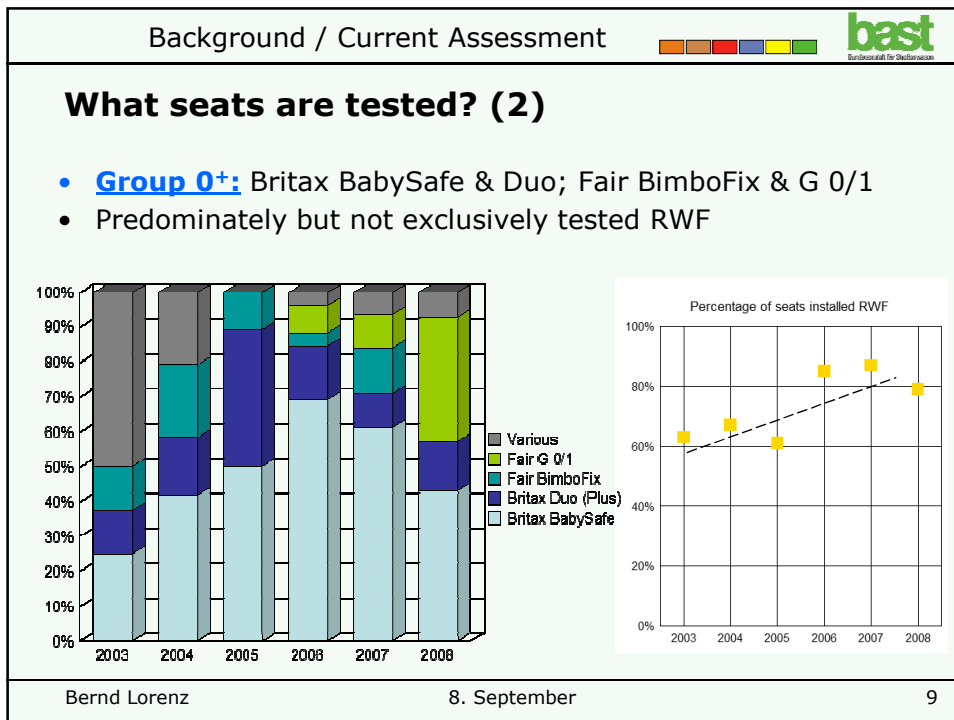






| Brand | Percentage |
|--------|------------|
| Britax | 71% |
| Fair | 18% |
| Kiddy | 7% |
| Other | 4% |


(Based on 262 child seats tested between 2003 and 2008)

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| Background / Current Assessment  | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
| Observations | | |
| <ul style="list-style-type: none">• Vehicle-CRS interface generally improved however still room for improvement (standardization of ISOFix)...• Affects only limited number of child seat manufactures and even less CRS models• Reflects a small, expensive segment of the total child seat market only• Impact on aftermarket and added value for consumer small• Availability of (larger) rearward facing seats has not significantly improved• Potential for real-world pediatric neck injury reductions has not been materialized | | |
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| Background / Current Assessment  | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
| Can we explain what we see? | | |
| <ul style="list-style-type: none">• Child protection often an "afterthought" – not seen as strong selling point or business to OEM• Protocol requires that OEM recommends seats• OEM needs reliable partner to guarantee good result• "Proven" seats represent low risk in failing requirements (in particular with respect to labeling requirements, etc.) – 4 stars! (old rating)• Protocol lacks clear incentive to promote RWF and ISOFix (e.g. no front seat dynamic assessment) | | |
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Background / Current Assessment 

Other concerns...

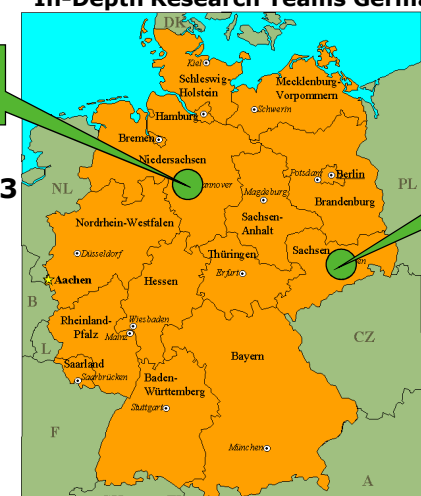
- Does consumer understand the rating is valid only for car-CRS combination?
- Limitations in biofidelity of dummies and biomechanical basis of criteria
- Focus only on younger children (protection of rear seat occupants!)
- Does not adequately address real-world misuse and usability
- Too much emphasis on labeling and marking?
- "Horrific" assessment protocol

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GIDAS German In-Depth Accident Study


In-Depth Research Teams Germany



Hannover MHH
since 1973

Dresden TUD
since 1999


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GIDAS German In-Depth Accident Study

Cooperation

**Medical University
Hannover**





**Technical
University**




**2000 case
documentations
per year**

BAST / FAT

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Background / Accident Data 

Doc Fi-07-03e Frontal Impact Group

European Commission frontal impact accident analysis study –
 Initial results and way forwards;
 David Richards on behalf of TRL, BASt and LAB

Frontal Impact dataset (2008) GB and FR)


Identification of target populations


Rear seat occupant Frontal impact dataset (2008)


| GB | | | FR | | |
|----------|-------------|--------------|----------|------------|-------------|
| Position | Fatal | All | Position | Fatal | All |
| Driver | 526 (72%) | 4730 (67.6%) | Driver | 1054 (76%) | 10397 (68%) |
| FSP | 142 (19.4%) | 1458 (20.2%) | FSP | 198 (14%) | 1983 (20%) |
| RSP | 63 (8.6%) | 807 (11.5%) | RSP | 136 (10%) | 1146 (12%) |
| | | | | | |
| | | | | | |
| | | | | | |

Rear seat occupants 9-10% of fatalities in frontal impacts

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| Background / Accident Data | |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------|
| <p>Opportunities to Improve Rear Seat Child Safety; K. Digges, E. Sahraei, R. Samaha; Protection of children in cars, 2009</p> | | |
| <p>Findings:</p> <ul style="list-style-type: none">• The benefit of the rear seat position has decreased in recent model year vehicles• Paired comparison of FARS 1991-2007: <p>all vehicle model years: fatality effectiveness of rear seat protection, compared to front seat protection: about 50% for restraint children < 8 years about 30% for restraint children 9 – 15 years</p> <p>model years 2000 and later: average rear seat effectiveness was less than 10% (not statistically significant)</p> | | |
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| Background / Accident Data | |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------|
| <p>Opportunities to Improve Rear Seat Child Safety; K. Digges, E. Sahraei, R. Samaha; Protection of children in cars, 2009</p> | | |
| <p>Reasons:</p> <ul style="list-style-type: none">• newer vehicles have become stiffer• safety design of newer vehicles may be beneficial to front occupants (advanced air bag- and belt systems)• advanced restraint technology has not been introduced in the rear seat | | |
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Background / Accident Data 

GIDAS

- All accidents in GIDAS from 2001 to 2008:

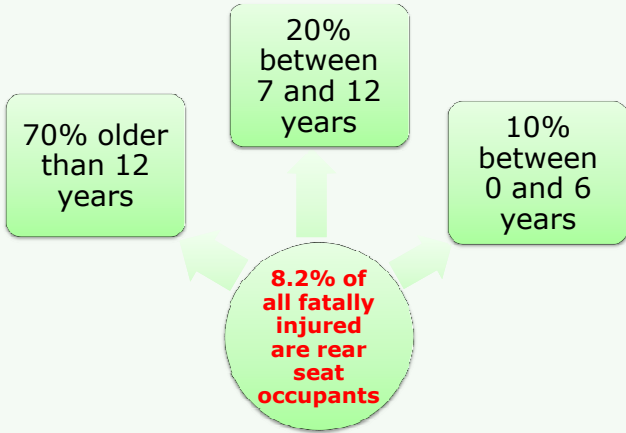
| | All | All [%] | Fatal [%] |
|-----------------|-------|---------|-----------|
| Driver | 14866 | 68% | 77,9% |
| Front Passenger | 4605 | 21% | 13,9% |
| Rear Passenger | 2397 | 11% | 8,2% |
| Total | 21868 | 100% | 100% |

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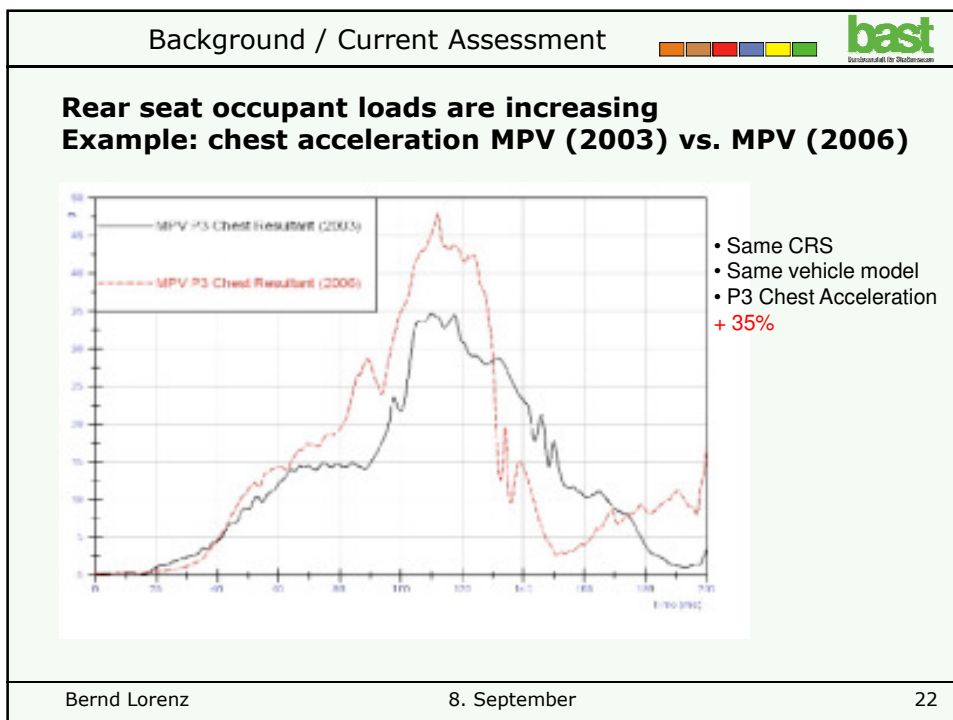
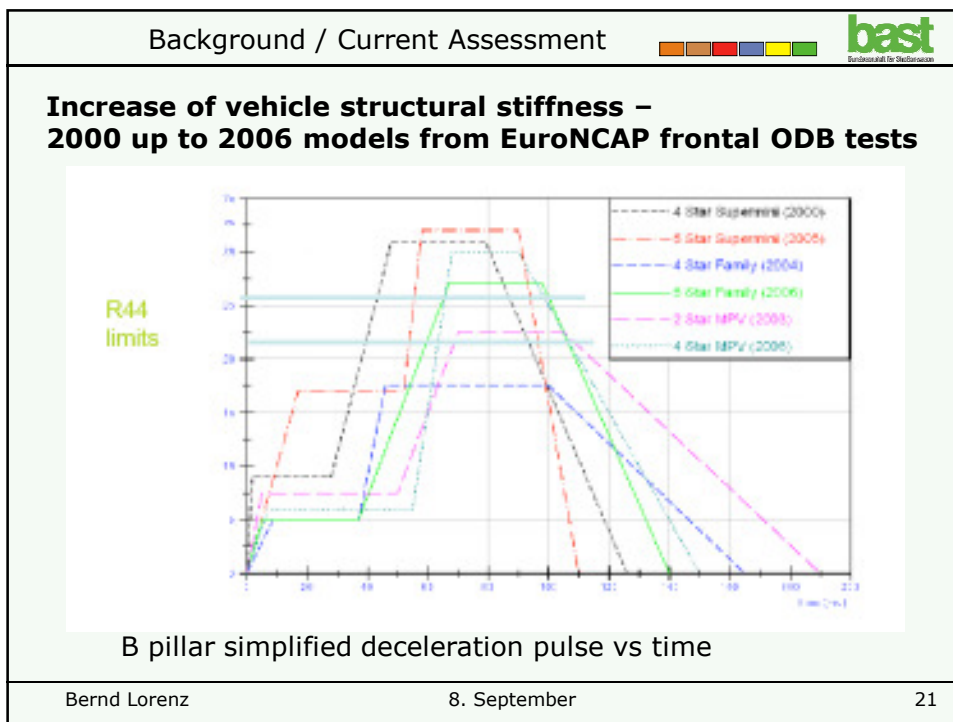
Background / Current Assessment 


GIDAS


- Rear Passenger Fatally Injured:




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| | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
| Background / Current Assessment  | | |
| Conclusions | | |
| <ul style="list-style-type: none">• Current system falls short of expectation• A more balanced approach is required involving main stakeholders (OEM, CRS suppliers and consumers)• An alternative approach is technically and logistically feasible | | |
| -> Need for Change! | | |
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| | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
|  | | |
| Content | | |
| <ul style="list-style-type: none">• Background / Current Assessment• Child Safety Working Group• Road Map• Summary | | |
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Child Safety Working Party 

How can we improve?



The diagram illustrates a shift in the relationship between stakeholders in child safety. On the left, a vertical stack of four rectangular boxes shows a linear flow: Euro NCAP (yellow) at the top, followed by OEM (blue), CRS Supplier (green), and Consumer (green) at the bottom. On the right, a circular flow of four circular nodes is shown: Consumer (green) at the top, Euro NCAP (yellow) in the center, CRS Supplier (green) at the bottom, and OEM (blue) on the left. A large red arrow points from the linear flow towards the circular flow, indicating a transition or improvement in the process.


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Child Safety Working Group 

Objective

- Improve child protection assessment within Euro NCAP by:
 - Enhance the relevance to real-world by including better tools, addressing all relevant child ages and adding misuse and ease-of-use aspects
 - Putting equal pressure on all stakeholders in accordance to their responsibility
 - Promoting rearward facing seats for taller children (up to about 3 years) and ISOFix usage
 - In support of regulatory developments

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| Child Safety Working Group | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
|  | | |
| Topics for discussion | | |
| <ul style="list-style-type: none">• Separation of CRS assessment from car assessment for smaller children• Independent CRS classification including misuse, ease-of-use and dynamic results• Replace younger children by older children in the dynamic car test• Base car assessment on CRS-car interface, front/side dynamic score older children and vehicle based assessment | | |
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| Child Safety Working Group | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
|  | | |
| <ul style="list-style-type: none">• Mandated by BoD in June 2009• Chaired by Bernd Lorenz (BASt)• Secretary Britta Schnottale (BASt)• Delegates/members:<ul style="list-style-type: none">• Andreas Ratzek / Volker Sandner (ADAC)• Jim Hand (DfT)• Rob Wegman (Dutch MOT)• Michiel van Ratingen / James Ellway (Euro NCAP)• Ronald Vroman (ICRT)• Hans Ammerlaan (RDW)• Anders Lie (SRA)• Francois Minne (UTAC)• Fahrid Bendjellal / Francois Renaudin (CLEPA)• Christoph Weimar / Joachim Fausel (ACEA/JAMA/KAMA)• Meetings:<ul style="list-style-type: none">– 1st July 2009– 29th September 2009– 23rd November 2009– 16th February 2010– 15th April 2010– 1st/2nd June 2010 Workshop | | |
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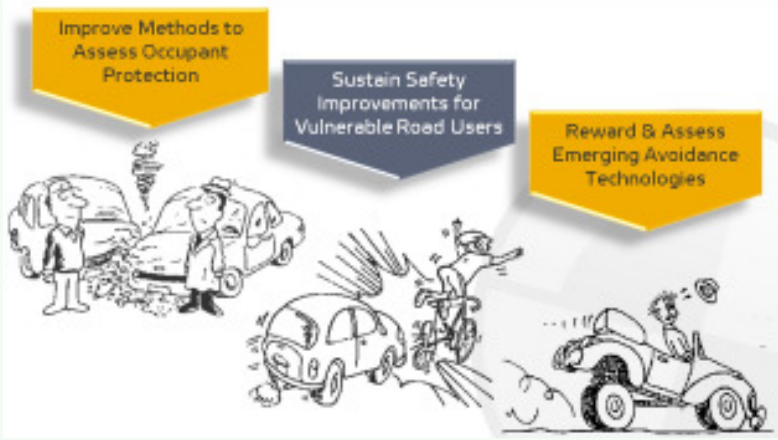
Strategic Agenda

- **Link society's safety ambitions and targets to the activities of Euro NCAP**
- **Realize the full potential of the overall rating system**
- **Particular attention to advanced safety systems**

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Key Initiatives 2010-2015



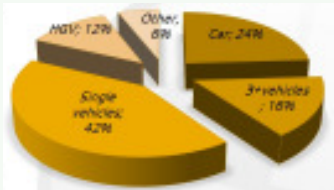
The diagram illustrates three key initiatives for the period 2010-2015, each represented by a colored arrow pointing to a corresponding illustration. The first initiative, 'Improve Methods to Assess Occupant Protection', is shown in a yellow arrow pointing to a cartoon of a car crash with a person being ejected. The second, 'Sustain Safety Improvements for Vulnerable Road Users', is in a blue arrow pointing to a cartoon of a car hitting a cyclist. The third, 'Reward & Assess Emerging Avoidance Technologies', is in a yellow arrow pointing to a cartoon of a car with a driver using a steering wheel with a sensor.

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Adult Occupant Protection


- **Review of frontal and side impact test procedures – Box 1 & 2**
 - **Accidents and societal trends**
 - **New biomechanical tools, criteria, etc.**
 - **Changing regulations (e.g. R94, R44)**
- **Broaden scope to N1 based vehicles**



Car occupant fatalities 2008
(Germany, N=2368)

| Category | Count |
|-----------------|-------|
| Single vehicles | 42% |
| 3+ vehicles | 18% |
| Car | 24% |
| Other | 16% |


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Adult Occupant Protection

- **Scenarios under review**
 - **Adding full width frontal test**
 - **Using 5th and 50th percentile dummies**
 - **WorldSID for side impact**
 - **Include adult rear seat protection**
- **WP on front and side impact reports in November 2010 – WG's start in 2011**


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Child Protection

- **Improve child protection assessment**
 - **Enhance relevance to real-world by including better tools, addressing all relevant child ages and adding misuse and ease-of-use aspects**
 - **Promoting rearward facing seats (up to about 3 years) and ISOFix usage**
 - **In support of regulatory developments (i-Size)**


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Child Protection


- **Cooperation with ETC (and possibly others)**
- **Use CRS consumer ratings to identify "best performing child seats" available on European market**
- **Re-focus on CRS compatibility, vehicle assessment and dynamic results**
- **Promote rear seat occupant protection (adults/taller children)**
- **Add luggage loading requirements**

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European Test Consortium for CRS




ETC 

European Test Consortium for Child Restraint Systems

- A joined test consortium of the *European Automobile Clubs* and a *Worldwide Association Of Consumer Organisations*
- Working together on the topic of child safety since 2003
- More than 250 crash tests and 500 handling tests are performed every year
- The harmonised results are published twice a year by the 30 partners
- Every partner is using his own logo, presentation format and identity

Status: Oct. 07th 2008

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8. September
37



Child Protection Concept of New Assessment

Rear seats

static test

CRS

- > best pick
- > EU27
- > 0, 0+, I, II, III

labelling, airbag switch etc.

CRS compatibility

vehicle assessment

dynamic test

small passenger

- > dynamic behaviour frontal/side impact
- > different sizes
- > CRS for taller children
- > ISOFIX
- >


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Child Protection – Best Pick


- **Best/good performing seats of ETC-Tests**
 - Dynamic assessment in frontal and side test
 - Misuse and handling test
- **European market**
- **Variant CRS seat types, like ISOFix, belted, support leg, top tether ...**
- **All weight classes covered, group 0 towards group III, plus combinations**
- **List to be published and annually reviewed**

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Child Protection – Top Pick List

9 best/good performing seats based on ETC assessment selected during workshop for try out



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Child Protection – Example from Top Pick List

- **Group 0+ infant carrier**
 - **Central Europe and southern Europe**
 - **Different solutions**
 - **Without base**
 - **With belted base (with/without support leg)**
 - **With ISOFix base and support leg**



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Content

- Background / Current Assessment
- Child Safety Working Group
- Road Map
- **Summary**


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Summary

- There is a need for improvement
- New rating system is powerful
- Road Map shows the goals for 2010-2015
- Working groups on Child Safety and Frontal & Side Impact will work in close cooperation
- Exchange of information with other stakeholders is welcome

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Thank you for your attention !



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