

IRCOBI Conference
10th-12th September 2014, Berlin

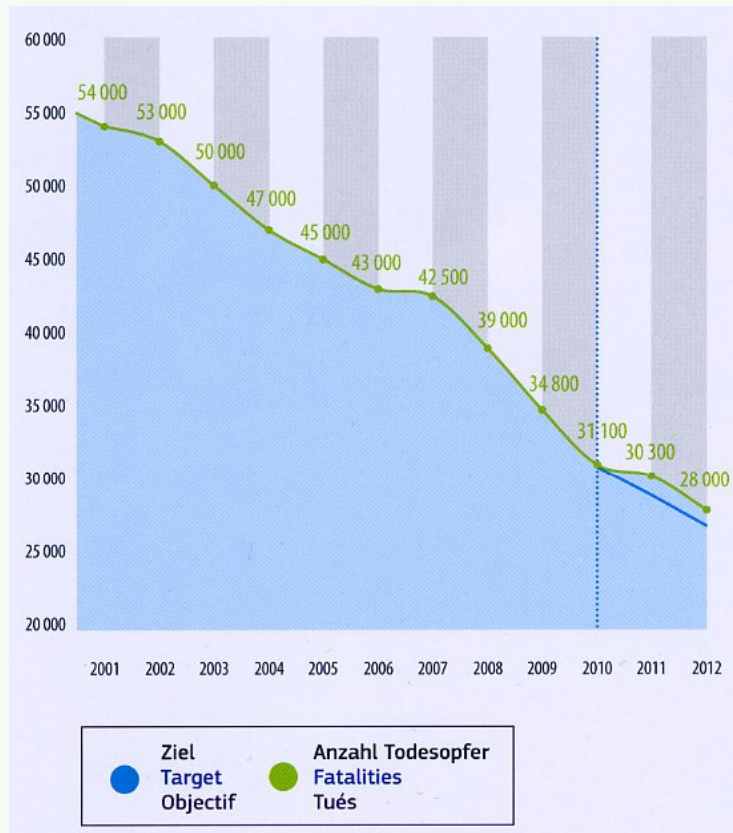
**Interaction:
Research - Regulation – Consumer Information**

Bernd Lorenz



Federal Highway Research Institute
Bundesanstalt für Straßenwesen

- **Introduction**
- **Decade of Action for Road Safety**
- **European Enhanced Vehicle Safety Committee (EEVC)**
- **European New Car Assessment Program (Euro NCAP)**
- **Global Technical Regulations (GTRs) / GTR Process**
- **Example for Interaction – GTR No. 7 Head Restraints**
- **Summary / Outlook**



Source: European Commission:
Road Safety 2012 – How is your country doing ?

- The “White Book” target of halving the number of road deaths within the EU until 2010 has not been reached.
- The „Roadmap to a single European Transport Area “ is targeting a further reduction of 50% of road deaths within the EU until 2020.
- The German national road safety action programme addresses similar targets as the European programme.
- UN Decade of Action for Road Safety 2011-2020 !
 **WEAR. BELIEVE. ACT.**
DECADE OF ACTION FOR ROAD SAFETY 2011-2020
- Several stakeholders are targeting “Vision Zero”.
- **However, still about 28.000 people died on European roads in 2012 !**



- Looking at a bigger picture about 1.3 million people are killed worldwide per year due to road traffic accidents and about 20 to 50 million more are injured.
- About 46% of those are vulnerable road users.
- Road traffic injuries have become the leading cause of death for people aged 15 to 29 years.
- The United Nation General Assembly proclaimed the UN “Decade of Action for Road Safety 2011-2020” in a landmark Resolution co-sponsored by 100 countries in 2010.
- The Decade of Action for Road Safety 2011-2020 was launched on May 11th, 2011.

Decade of Action for Road Safety 2011-2020



Source: World Health Organization: Decade of Action for Road Safety 2011-2020, Global Launch. Booklet.

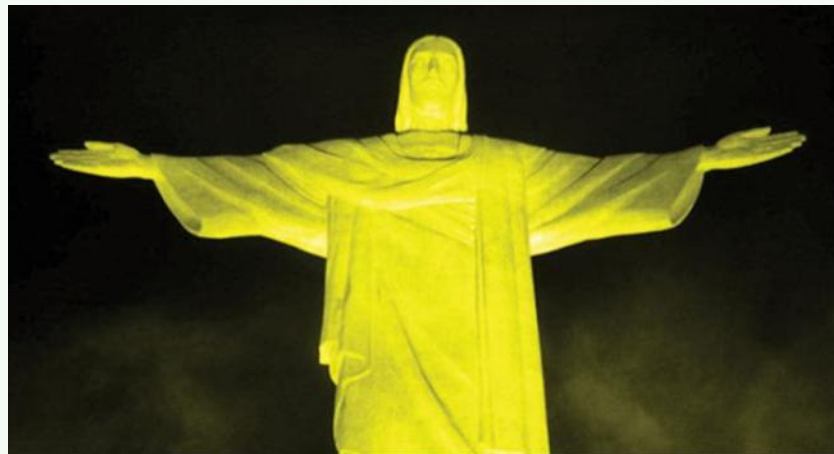
Decade of Action for Road Safety 2011-2020



Decade of Action Tag projected onto Moscow State University Building



Decade of Action Tag projected onto Trafalgar Square, London



Christ the Redeemer, Rio, illuminated in yellow (colour of road safety tag)



Decade of Action Tag projected onto Sydney Harbour

Source: www.decadeofaction.org

The aim is to stop the increase and to decrease the number of fatalities and injuries in road traffic accident significantly by 2020. If all actions will be successful it is expected that about 5 millions lives will be saved until 2020.

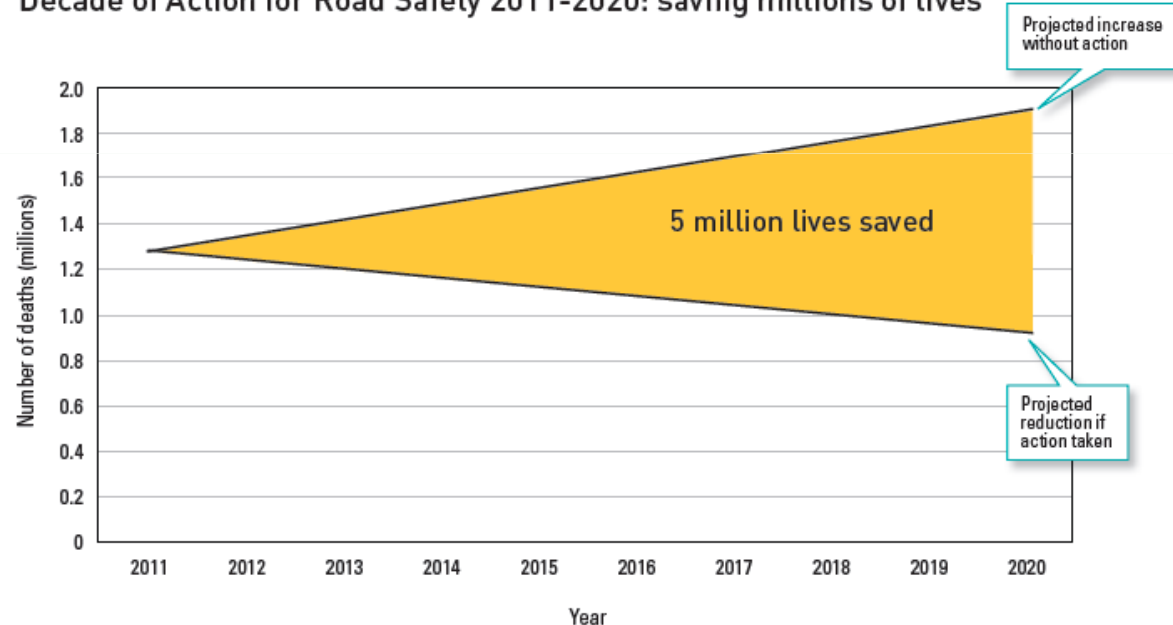
Global Plan

for the Decade of Action
for Road Safety 2011-2020



**DECADE OF ACTION FOR
ROAD SAFETY 2011-2020**

Decade of Action for Road Safety 2011-2020: saving millions of lives



Source: World Health Organization: Decade of Action for Road Safety 2011-2020, Saving Millions of Lives. Booklet.

Global Plan



UN Secretary-General Ban Ki-moon



Source: Etienne Krug Director WHO: One-year progress update: Decade of Action for Road Safety 2011-2020

Global Plan Decade of Action for Road Safety 2011-2020



Pillar 3 Safer Vehicles

This pillar addresses the **need for improved vehicle safety by encouraging harmonization of relevant global standards** and mechanisms **to accelerate the uptake of new technologies which impact on safety**.

It includes activities such as implementing new car assessment programmes so that consumers are aware of the safety performance of vehicles, and trying to ensure that all new motor vehicles are equipped with minimum safety features, such as seat-belts.

Other activities covered include **promoting more widespread use of crash avoidance technologies with proven effectiveness**, such as electronic stability control and anti-lock braking systems.

Managers of fleets are also encouraged to purchase, operate and maintain vehicles that offer high levels of occupant protection.

Source: World Health Organization: Decade of Action for Road Safety 2011-2020, Saving Millions of Lives. Booklet.

Decade of Action for Road Safety 2011-2020



INSURANCE INSTITUTE
FOR HIGHWAY SAFETY



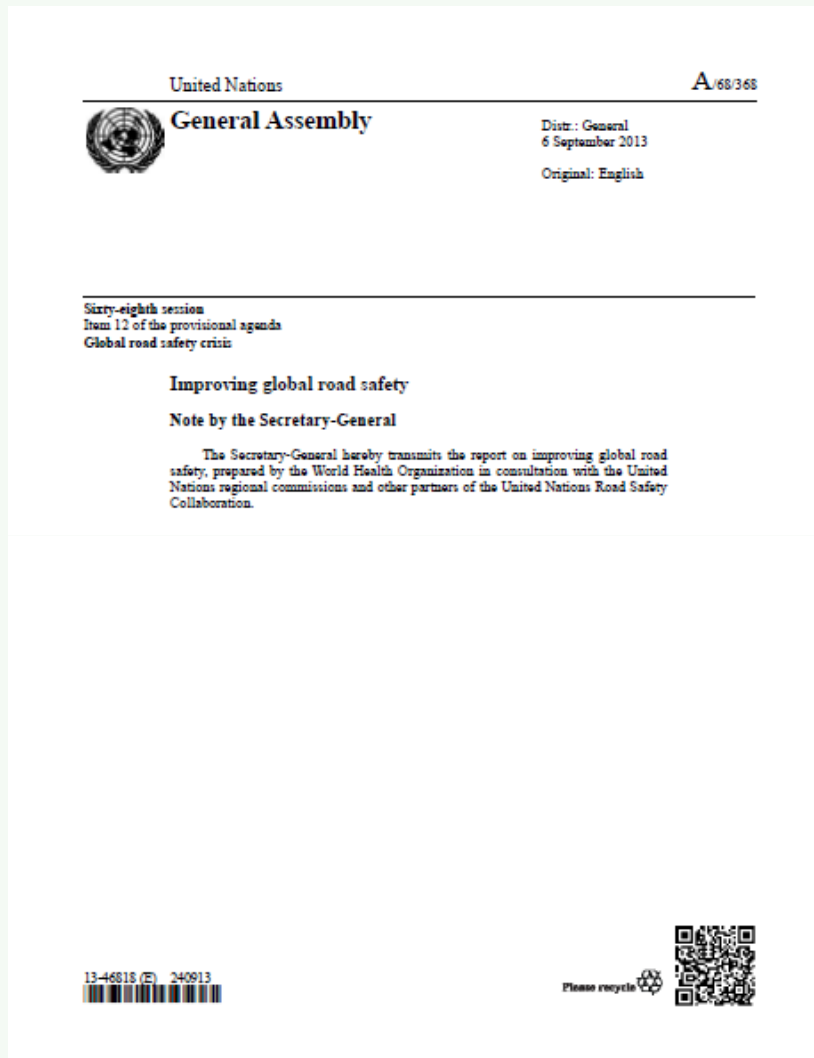
GNCAP is governed by a Board of Trustees under the Chairmanship of Max Mosley (former President of the Federation Internationale de l'Automobile (FIA), and past Chairman of the European New Car Assessment Programme). Other Trustees include: Guido Adriaenssens (of International Consumer Research & Testing), Lauchlan McIntosh, Chairman of the Australasian New Car Assessment Programme, Claes Tingvall (former Chairman of the European New Car Assessment Programme), and David Ward (of the FIA Foundation).

The GNCAP is pleased to acknowledge grant support from the FIA Foundation.

For further information please contact: Global New Car Assessment Programme, 60 Trafalgar Square, London WC2N 5DS, UK. Telephone: + 44 (0) 20 7 747 5195, email: info@globalncap.org



Source: www.globalncap.org



33. ...The Global New Car Assessment Programme is also supporting the development of new car assessment programmes in Latin America and within the Association of Southeast Asian Nations (ASEAN). ... The 2013 Annual Meeting of the Global New Car Assessment Programme was held in Seoul in May 2013, where the **Seoul Declaration** was adopted. It called for global agreement that all new passenger cars worldwide should pass the minimum United Nations crash test standards (ECE regulations 94 and 95) and encouraged early adoption of the global technical regulations for electronic stability control (No. 8) and for **pedestrian protection (No. 9)**.

Interaction: Research, Legislation and Consumer Information



- Legal activities (like EEVC, UNECE) and consumer test programmes (like Euro NCAP, JNCAP) are or have been influenced by each others in both ways.
- Some members of Euro NCAP are also members of EEVC- and GRSP-working groups (incl. IWG).
- Research projects funded by the EU-Commission are used for (co-) funding regulation related research (e.g. compatibility, child safety, dummies etc.).





- In general European Governments do not have own research institutes anymore due to restricted budgets (exemption BAST)
- New dummies and test procedures are developed and partially validated within EU-projects (like APROSYS, FIMCAR, EPOCH)
- The financial engagement in EEVC by the participating countries is more and more reduced. EEVC tries to have influence or steer the EU-projects
- Also within the framework of UNECE and Euro NCAP results of EU-projects are acknowledged and considered (like APROSYS, THORAX, FIMCAR, EPOCH, CASPER, INVITER, ASSESS) and/or expected (like AsPeCSS)



Legislation and Consumer Information







- **EEVC: European Enhanced Vehicle-safety Committee**
- **Founded in 1970**
- **Founding member states: France, Germany, Greece, Italy, Netherlands, Poland, Spain, Sweden, UK**
- **Working Group members: National delegates and industry experts**
- **Focus on passive safety**
- **Development of regulatory test tools and test procedures**
- **-> ECE R94, R95, regulation on pedestrian safety**



EEVC Working Groups

- **WG 12 Biomechanics**
- **WG 13 Side Impact (not active since 2010)**
- **WG 14 Truck Under-run (not active)**
- **WG 15 Compatibility (on hold, was monitoring FIMCAR)**
- **WG 17 Pedestrian Protection (last meeting 2007!)**
- **WG 18 Child Safety**
- **WG 19 Driver Assistance Systems (last meeting 2009!)**
- **WG 20 Rear Impact, Whiplash (last meeting 2009!)**
- **WG 21 Accident Studies**
- **WG 22 Virtual Testing (last meeting 2009, on hold, monitoring IMVITER)**
- **WG 23 Bus and Coach Frontal Collision**





For years EEVC has been partially inactive in several fields.

- In general European Governments do not have own research institutes anymore due to restricted budgets (exemption BAST).
- New dummies and test procedures are developed and partially validated within EU-projects (like APROSYS, FIMCAR, THORAX, EPOCH).
- The financial engagement in EEVC by the participating countries is more and more reduced.
- EEVC is in the process to realign realign!
- Since April 2014 new secretary general – Bernd Lorenz
- Move from a working group based to a project based procedure
- New voting system: simple majority; maintaining silence = agreement
- Membership status definition (full member of the year, sleeping full member, associated member)

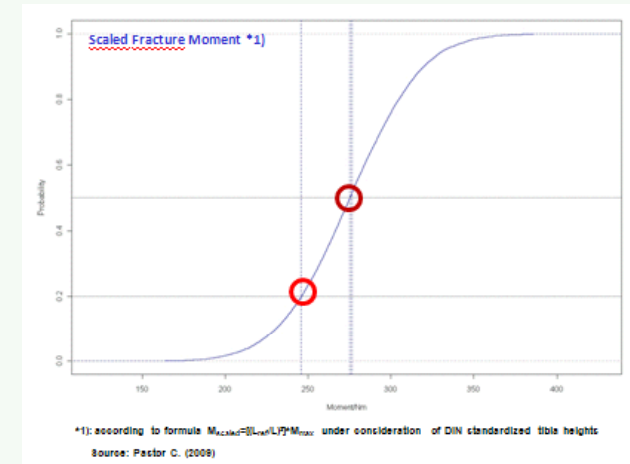
EEVC Working Group 12 - Biomechanics, Advanced Dummies

- **Chairman: Prof. Jac Wismans (NL)**
- **Terms of Reference:**
The aim is to co-ordinate dummy and biomechanical research in Europe in order to assist in the development of acceptable adult and child dummies for passenger cars and light trucks.

EEVC Working Group 12 - Biomechanics, Advanced Dummies



- Monitoring of developments regarding frontal impact Dummy (THOR)
- Assessment of Child dummies (Q dummies)



- Development and assessment of injury risk curves for all accident types and road users (adults and children, whiplash, pedestrian)
 - Recent achievements:
 - Draft Report on Q10 injury criteria for frontal impact to UNECE IG CRS

- EEVC WG 20 has published reports on (www.eevc.org):
 - **Summary Report: Requirements and Assessment of Low-Speed Rear Impact Whiplash Dummies**
 - **EEVC WG20 Report - Static Test of Head Restraint Geometry: Test Procedure and Recommendations**
 - **EEVC Dummy Requirements and Injury Criteria for a Low-speed Rear Impact Whiplash Dummy**
 - **Review of Recommendations regarding the use of Hybrid III in Low-speed Rear Impact 'Whiplash' Tests**
 - **EEVC The use of the Hybrid III Dummy in Low-speed Rear Impact Testing**
 - **EEVC Recommendations for a Low-speed Rear Impact Sled Test Pulse**
- WG 12 has provided a report on „Evaluation of seat performance criteria for rear-end impact testing: BioRID II and insurance data” (2013, Johann Davidson, Chalmers). [This report was also provided to the Informal Working Group on Head Restraints Phase 2!](#)

Euro NCAP

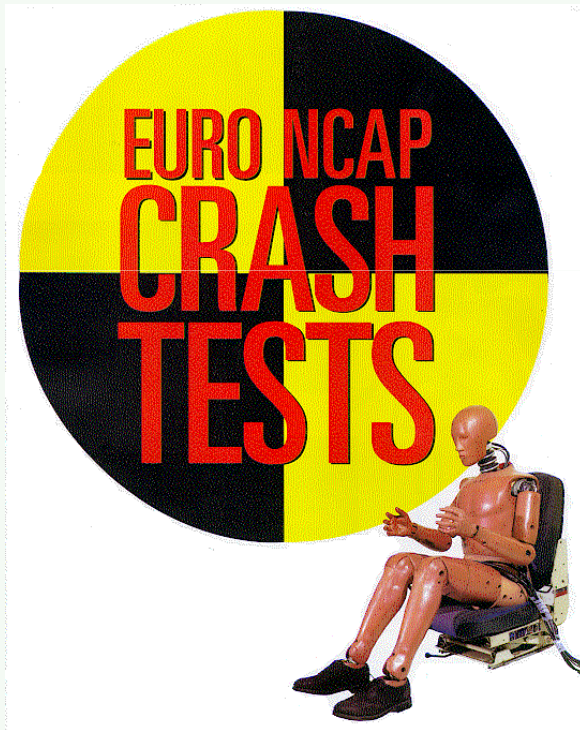


European New Car Assessment Program



- Formation in 1997 (UK)
- Based in Brussels
- Fully independent
- Not for profit
- Backed by European governments, motoring, consumer and insurance organisations

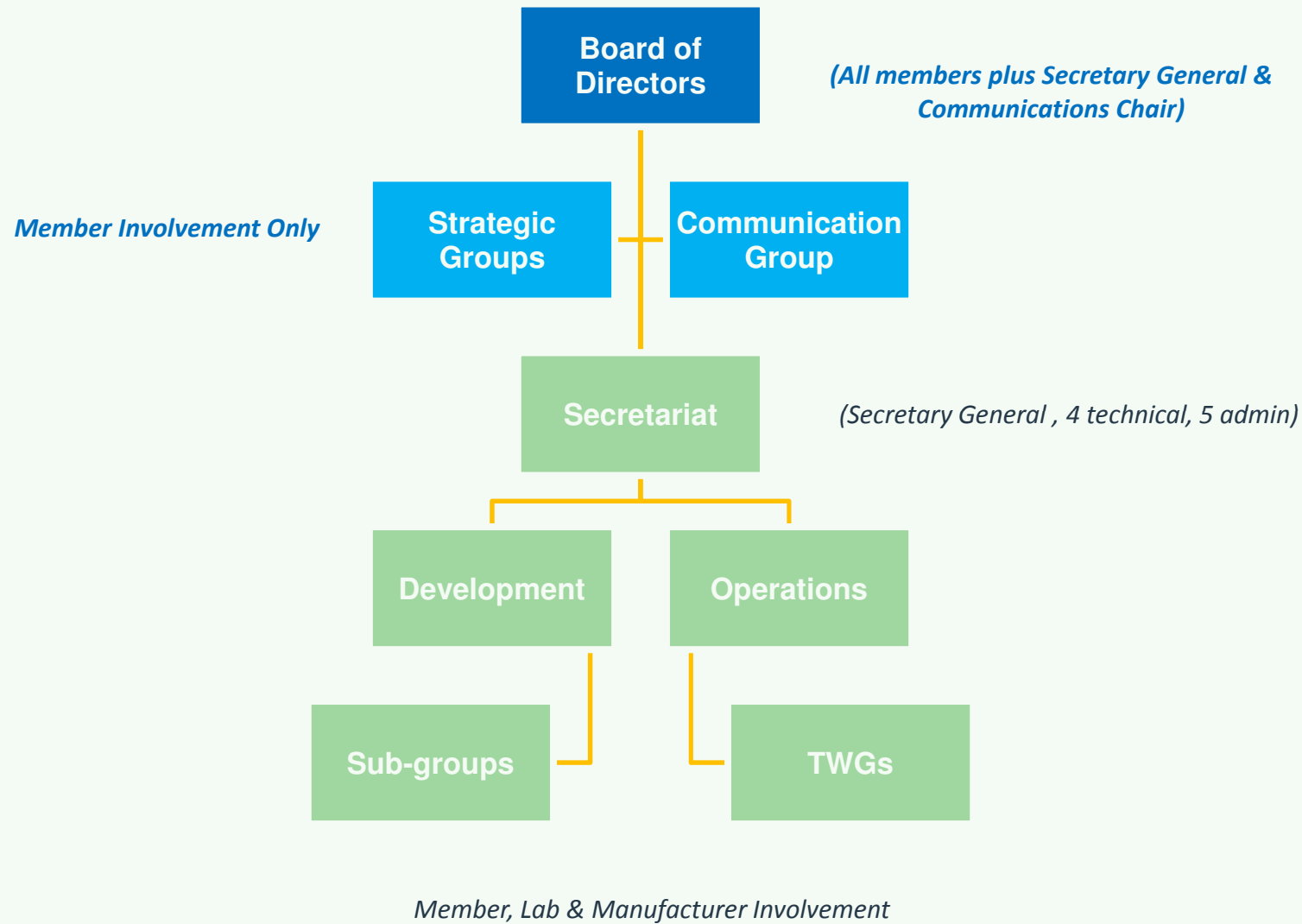




- ADAC (Allgemeiner Deutscher Automobil Club)
- BMVI represented by **BASt**
- DfT (Department for Transport, UK)
- Dutch Ministry of Transport (NL)
- European Commission (no member!)
- FIA (Federation International de L automobile)
- Generalitat de Catalunya (ES)
- ICRT (International Consumer Research and Testing)
- Ministère de l'Équipement (F)
- STA (Swedish Transport Administration)
- Thatcham (representing Britische motor insurance)
- Ministère des Transports (Luxemburg)
- Automobilclub Italien (ACI)

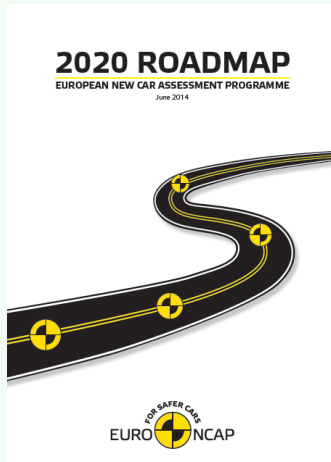


Organisation





In June 2014 Euro NCAP published the Roadmap until the year 2020.

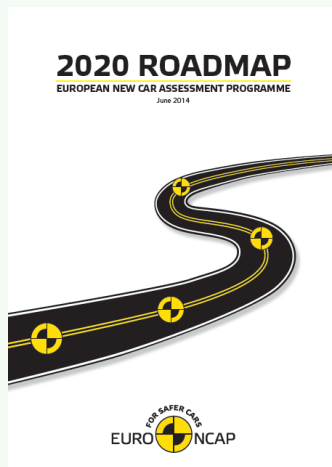


5.1 occupant protection in front and side crashes (domain i)

Rationale: Front and side crashes continue to dominate the number of road traffic fatalities and serious injuries. In frontal crashes, the focus will be on improved interaction between vehicles involved in a crash. **Improved restraint system robustness for a diverse driver and occupant population means more attention to the elderly and the young of all sizes. Injuries sustained in far side crashes, mostly to head and thorax, can be mitigated by deployment of advanced restraint systems.**

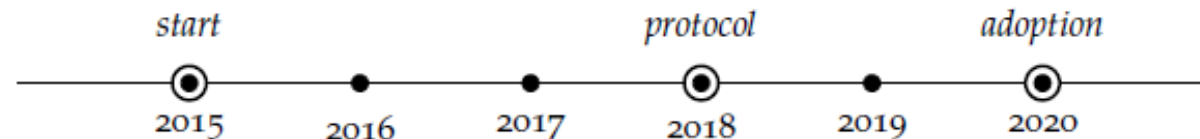
Enablers: Enhanced front structures; **adaptive restraints; seatbelt airbags; interaction airbags**; occupant detection; **THOR mid-sized male dummy**.

European New Car Assessment Program: 2020 Roadmap. Brussels, June 2014.

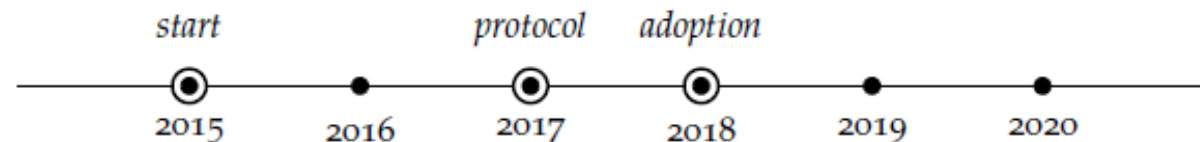


Deliverables:

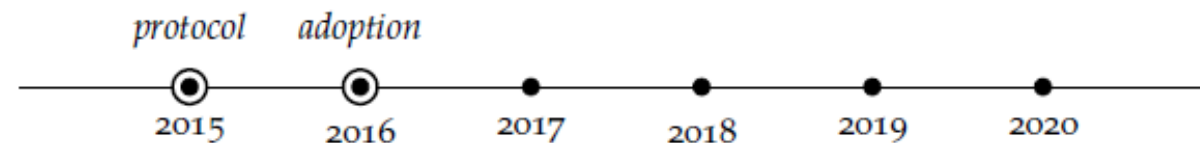
- I.1 *Mobile solution to offset front impact protection to improve structural engagement for a broad range of vehicles (superseding the current off-set impact test); review of advanced anthropomorphic test device. Target action: Vehicle Safety Rating.*



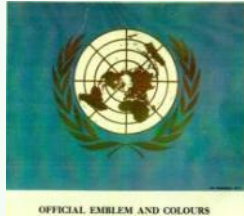
- I.2 *Updates to the side impact test suite to include far side occupant protection for driver and front passenger(s). The focus will be on adding an incentive to the existing procedure in order to reward systems that protect against far-side occupant injury caused by occupant and/or interior interaction. Target action: Vehicle Safety Rating.*



- I.3 *Biomechanical assessment of 6 and 10 year old child injury risk in front and side impact: criteria and limits for critical child body regions (based on ongoing work); R129 vehicle based assessment and update to CRS installation top-pick list. Target action: Vehicle Safety Rating.*



European New Car Assessment Program: 2020 Roadmap. Brussels, June 2014.



Global Technical Regulations

Worldwide Harmonisation Efforts

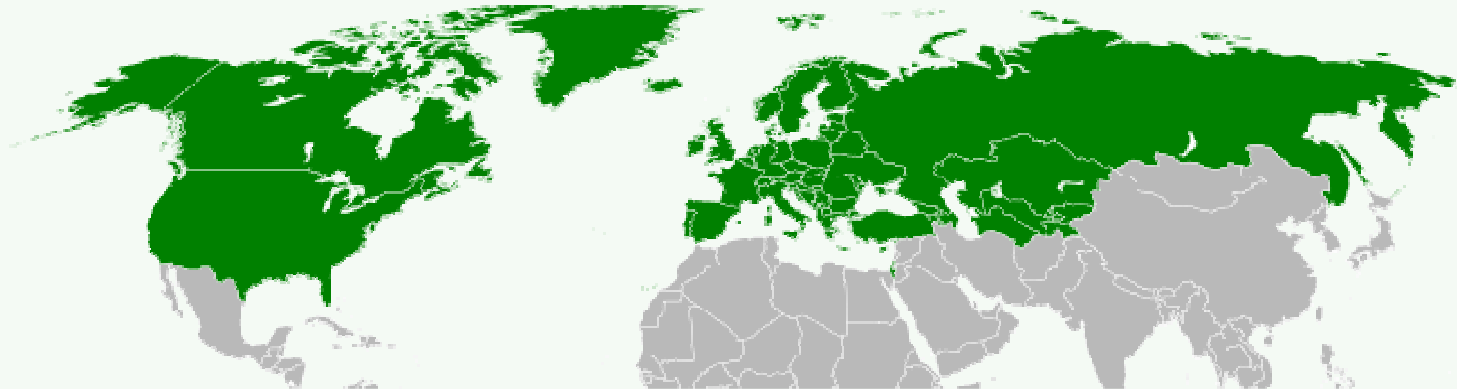
Global Technical Regulations (GTRs)

- engage harmonisation regardless of type of compliance and enforcement procedures in contracting parties (e.g. USA: self certification)
- continuously improving and seeking high levels of safety in developed and developing countries
- promoting/establishing higher standards
- promoting/establishing additional standards

UN/ECE



- **United Nations Economic Commission for Europe**
- **Founded in 1947 by UN Economic and Social Council (ECOSOC)**
- **Affiliated organizations of the United Nations: UN/ECA (Africa), UN/ECLAC (Latin America and the Caribbean), UN/ESCAP (Asia and the Pacific), UN/ESCWA (Western Asia)**
- **Main task: improved economic collaboration between member states**
- **Currently 56 member states:**



Source: http://de.wikipedia.org/wiki/Wirtschaftskommission_f%C3%BCr_Europa

Movement of legislation activities towards UN/ECE

- Establishment of a new framework Directive (2007/46/EC) for a harmonized environment for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended therefore
- 2007/46/EC is referring to 62 separate EC Directives and Regulations
- As from November 1st, 2014 on, the General Safety Regulation (GSR, Regulation (EC) No. 661/2009) repeals, amongst others, 50 EC Directives and Regulations that are associated with M1 vehicles by consolidating all of the technical requirements from these 50 "separate" Directives into the new Regulation by including references to the corresponding UN (ECE) Regulations
- UN regulations shall be mandatory for type approval
- Technical requirements for motor vehicles shall be laid down in UN regulations in the future, only.

1958 and 1998 Agreements

- More than 50 agreements are under UN/ECE supervision, like
 - **1958 Agreement:**
Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions
 - ✓ **51 contracting parties** (*Germany since 1966*)
 - ✓ **131 ECE Regulations** (*Safety: R14, 16, 17, 44, 94, 95, 127, 129...*)
 - **1998 Agreement:**
Agreement concerning the establishing of Global technical regulations for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles
 - ✓ **33 contracting parties** (*Germany since 2000*)
 - ✓ Up to now **14 GTR's**

Participating countries of the 1958 agreement (February 2013):



Code	Country	Code	Country	Code	Country
1	Germany	19	Romania	39	Azerbaijan
2	France	20	Poland	40	Republic of Macedonia
3	Italy	21	Portugal	42	European Community
4	Netherlands	22	Russian Federation	43	Japan
5	Sweden	23	Greece	45	Australia
6	Belgium	24	Ireland	46	Ukraine
7	Hungary	25	Croatia	47	South Africa
8	Czech Republic	26	Slovenia	48	New Zealand
9	Spain	27	Slovakia	49	Cyprus
10	Serbia	28	Belarus	50	Malta
11	United Kingdom	29	Estonia	51	Republic of Korea
12	Austria	31	Bosnia and Herzegovina	52	Malaysia
13	Luxembourg	32	Latvia	53	Thailand
14	Switzerland	34	Bulgaria	54	Albania
16	Norway	35	Kazakhstan	56	Montenegro
17	Finland	36	Lithuania	58	Tunisia
18	Denmark	37	Turkey	62	Egypt

Participating countries of the 1998 agreement (June 2013):

Since	Country	Since	Country
25.08.00	Canada	05.03.02	Netherlands
25.08.00	United States of America	14.06.02	Azerbaijan
25.08.00	Japan	22.06.02	Spain
25.08.00	France	24.06.02	Romania
25.08.00	United Kingdom	01.03.03	Sweden
25.08.00	Germany	29.11.04	Norway
25.08.00	Russian Federation	11.06.05	Cyprus
25.08.00	European Union	15.11.05	Luxembourg
09.12.00	P.R. China	04.04.06	Malaysia
01.01.01	Republic of Korea	22.04.06	India
30.01.01	Italy	25.07.06	Lithuania
17.06.01	South Africa	17.03.07	Moldova
07.08.01	Finland	01.01.08	Tunisia
21.08.01	Hungary	07.06.08	Australia
01.09.01	Turkey	27.08.11	Kazakhstan
06.01.02	Slovakia	26.02.12	Tajikistan
26.01.02	New Zealand		



Agreements from 1958 and 1998

- Administrated by the Inland Transport Committee (ITC) and organized by WP.29
- **WP.29** (World Forum for Harmonisation of Vehicle Regulations) was founded in 1952
- **The Working Party on Passive Safety (GRSP)** supports WP.29 with regard to the preparation of regulatory proposals in the field of passive vehicle safety



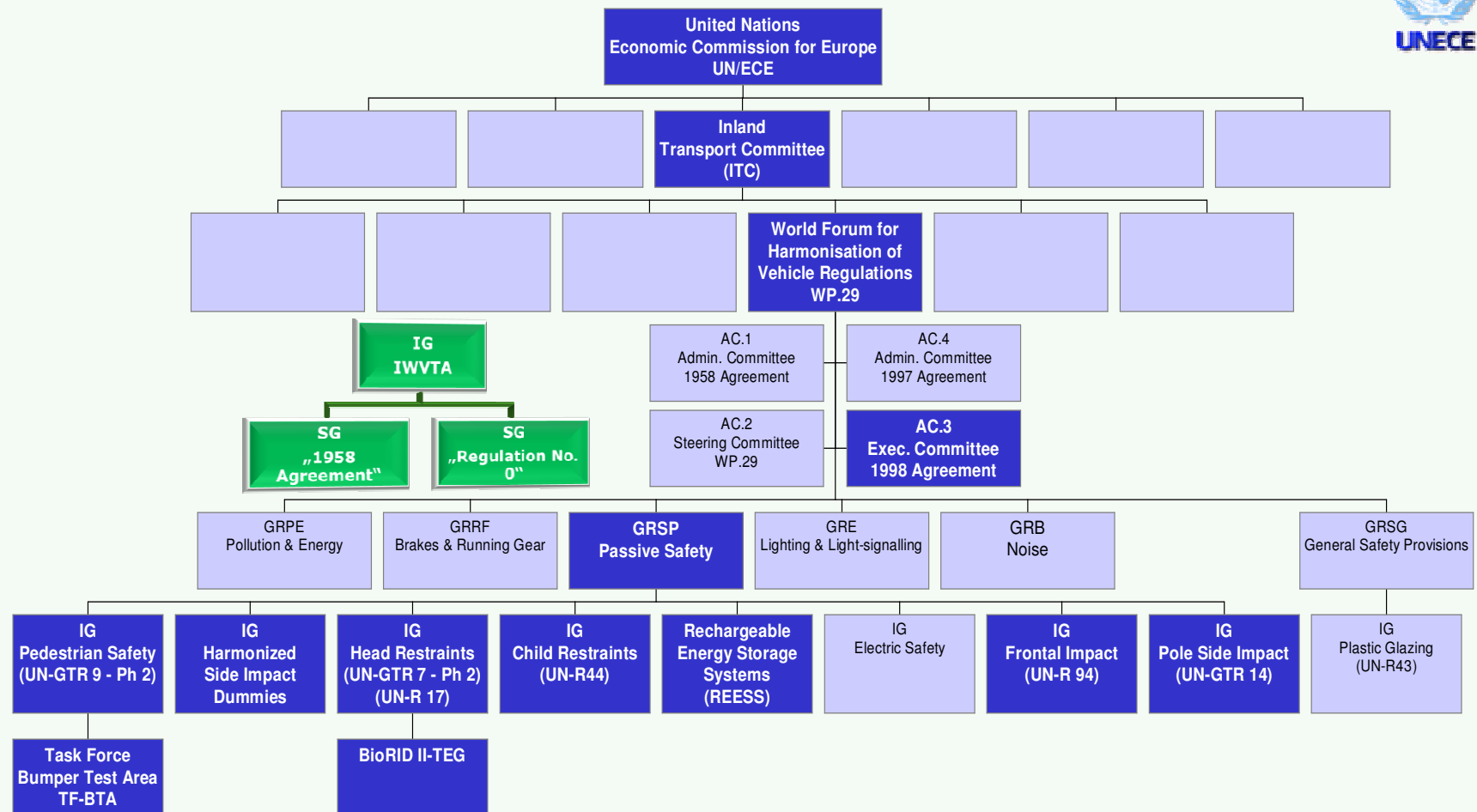
1958 Agreement:



1998 Agreement:



Structure of UN/ECE

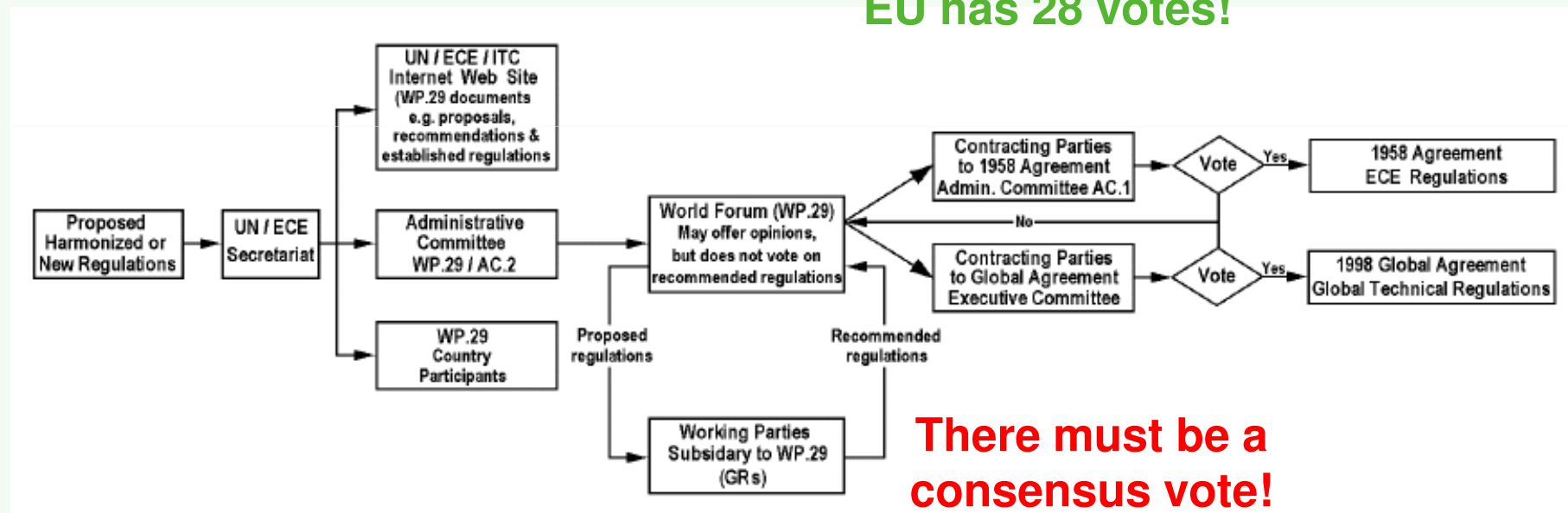


Differences between the 1958 and 1998 Agreements



Decision process:

Majority vote!
EU has 28 votes!



**There must be a
consensus vote!**
**EU has one vote,
only!**

Source: UNECE: World Forum for Harmonization of Vehicle Regulations (WP.29). How it works, how to join it.

Overview of established GTRs



UN-GTR No.	Title
1	Door locks and door retention components
2	Measurement of motor cycle emissions
3	Motorcycle brake systems
4	Test procedure for gas (NG) driven vehicles with regard to the emission of pollutants
5	Technical requirements for on-board diagnostic systems (OBD) for road vehicles
6	Safety Glazing Materials
7	Head Restraints
8	ESC (Electronic Stability Control systems)
9	Pedestrian Safety
10	Heavy-duty off-cycle emissions vehicles
11	Engine emissions from agricultural and forestry tractors and from non- road mobile machinery
12	Location, identification and operation of motorcycle controls, tell-tales and indicators
13	Hydrogen and fuel cell vehicles
14	Pole side impact



- **Informal WG Head Restraints (GTR 7 Head Restraints Phase 2)**
- **Informal WG ECE-R 44 & R (ECRS) (Child Restraint Systems)**
- **Informal WG ECE-R 94 (Frontal Impact)**
- **Informal WG on Electric Vehicle Safety**
- **Informal WG Rechargeable Energy Storage Systems (REESS)
to adapt ECE-Regulations w.r.t the safety of rechargeable energy storage
systems**
- **Informal WG on Pole Side Impact GTR (finalized)**
- **Informal WG GTR 9 Phase 2 (Pedestrian Safety)**
- **Informal WG on harmonized Side Impact Dummies**
- **Technical Evaluation Group BioRID**
- **Task Force Bumper Test Area (TF-BTA)**



Example

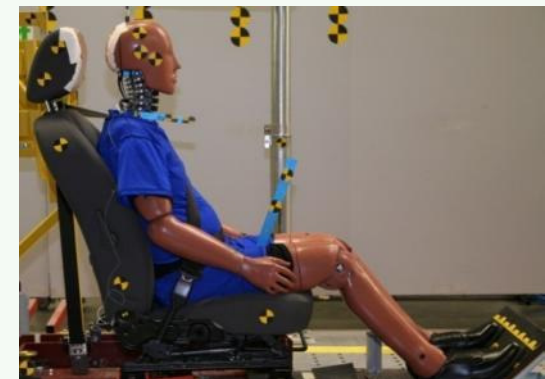
Interaction research, regulation, consumer information

GTR No. 7 Head Restraints

Informal Working Group GTR 7 Phase 2: Head Restraint Systems



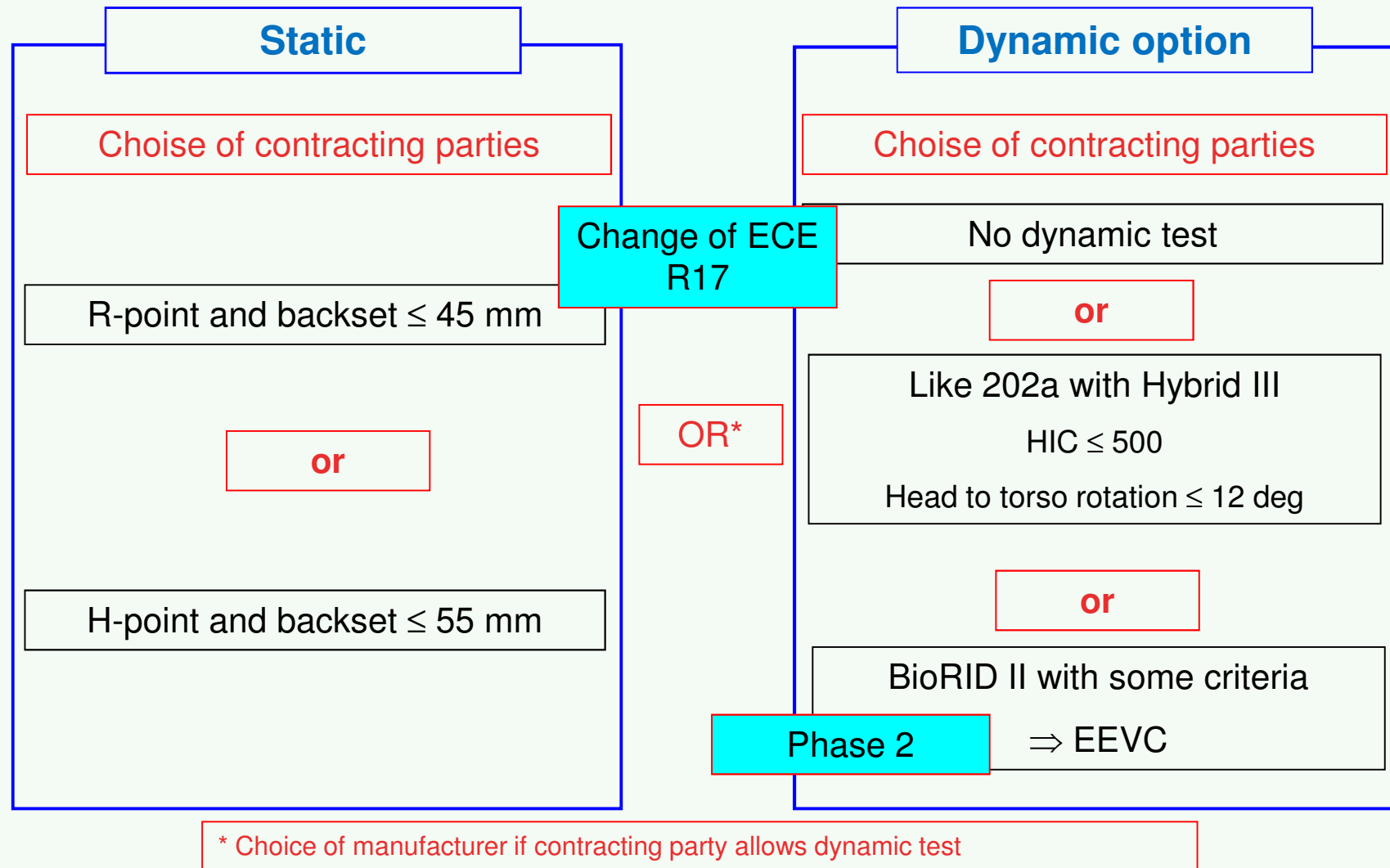
- On its **March 2008** meeting WP.29 contracting parties adopted GTR No. 7.
- The use of Hybrid III for the dynamic test is part of GTR No. 7, but it is at the choice of each member state to use an alternative dynamic test procedure with BioRID Dummy.
- In **June 2009** a proposal for the development of a phase 2 of GTR No. 7 was accepted by AC.3 (Executive Committee of 98 Agreement).
- Chairman of the new IWG: B. Frost (DfT / UK)
- Main topics of the IWG:
 - (minimum) head restraints height of [850] mm
 - dynamic test procedure with BioRID II
 - Injury criteria and certification corridors for the BioRID II



GTR No. 7 Head Restraints - Phase I



Status of GTR No. 7 $\Rightarrow$ a GTR full of options !



Informal Working Group GTR 7 Phase 2: Head Restraint Systems

- Two step approach:
 - Low speed dynamic test for minor neck injuries including long term consequences (up to WAD 2, “ECE”-approach)
 - Mid or high speed test for other injuries (AIS 2+, NHTSA approach)
- 1st official meeting of the IG phase 2 in December 2009: review of current activities in Europe, Korea, USA and Japan
- Up to now, 15 meetings – last meeting 5th and 6th of February 2014, Brussels
- WP.29 agrees to skip the high severity test (Proposal USA)
- For GTR then a mid severity pulse shall be applied (~~either Euro NCAP style~~ ~~or~~ JNCAP style)
- In parallel a technical evaluation group to assess BioRID II (BioRID TEG) was established (chaired by Bernd Lorenz BAST)
- A smaller GTR No 7 so called review group is consolidating the draft GTR in principal via WebEx meetings



-
- German
- Berlin
va
EG – Brussels
on D.C.
eneva

- **22nd January 2010: last official Global BioRID User (WebEX) Meeting (GBUM) chaired by Mike Beebe (Denton)**
- **3rd February 2010: joint with IWG GTR No. 7 - Tokyo**
- **15th of March 2010: 1st WebEX meeting (hosted by Denton)**
- **28th April 2010: 2nd WebEX Meeting (hosted by FTSS)**
- **13th July 2010: 3rd WebEX meeting (hosted by Humanetics)**
- **7th September 2010: 4th WebEX meeting (hosted by Humanetics)**
- **21st-22nd September 2010: joint with IWG GTR No. 7 – Berlin**
- **29th November 2010: 5th WebEx – (hosted by Humanetics)**
- **6th December 2010: joint with IWG GTR No. 7 – Geneva**
- **7th February 2011: 6th WebEx – (hosted by Humanetics)**
- **28th February 2011: joint with IWG GTR No. 7 – Brussels**
- **14th April 2011: 7th WebEx – (hosted by Humanetics)**
- **1st June 2011: 8th WebEx – (hosted by Humanetics)**
- **10th June 2011: joint with IWG GTR No. 7 – Washington D.C.**
- **5th/6th December 2011: joint with IWG GTR No. 7 – Geneva**
- **14th December 2011: 9th WebEx – (hosted by Humanetics)**
- **31st January 2012: 10th WebEx – (hosted by Humanetics)**

- **23rd February 2012: face to face meeting and 11th WebEx – Bast, Bergisch Gladbach**
- **14th March 2012: 12th WebEx – (hosted by Humanetics)**
- **19th March 2012: joint with IWG GTR No. 7 – London**
- **18th June 2012: joint with IWG GTR No. 7 – Munich**
- **3rd July 2012: 13th WebEx – (hosted by Humanetics)**
- **10th / 11th December 2012: joint with IWG GTR No. 7 – Geneva**
- **12th/13th February 2013: joint with IWG GTR No. 7 – Brussels**
- **26th of March 2013: GTR No. 7 Workshop – Bast, Bergisch Gladbach**
- **18th of April 2013: 14th WebEx - (hosted by Humanetics)**
- **23rd/24th April 2013: joint with IWG GTR No. 7 – Paris**
- **16th of July 2013: GTR No. 7 Workshop – Bast, Bergisch Gladbach**
- **9^h/10th September 2013: joint with IWG GTR No. 7 – Gothenburg**
- **30th of September 2013: 15th WebEx (certification procedure)**
- **30th of October: 2013 joint WebEx GTR No. 7 BioRID TEG**
- **31st of October 2013: WebEx with experts from workshop on Annex 9 text**
- **29th of January 2014: 16th WebEx**
- **In 2014 several smaller WebEx Meeting**

Informal Working Group GTR 7 Phase 2: Head Restraint Systems

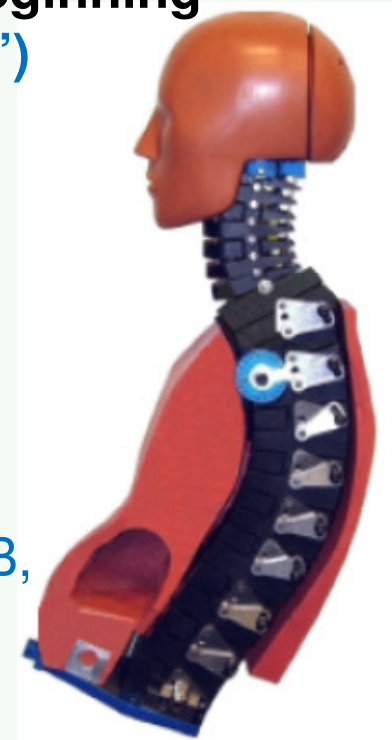
Technical evaluation group to assess BioRID II (BioRID TEG):



- A new certification procedure in use since beginning of 2011 (further update ongoing “GEN-X test”)
- PADI available on UNECE website (further update ongoing)

Issues under Discussion / Research

- Dummy Drawings review
- Improved certification procedure and corridors
- Repeatability and Reproducibility (VRTC, OSRP, PDB, EC/TRL , BAST...)



Source: Denton

Harmonization of Drawings (Humanetics)

Procedures for Assembly,
Disassembly, and Inspection
(PADI)
of the BioRID II Rear Impact
Crash Test Dummy



November 2010

Appendix E – BioRID II Design Checklist

BioRID II Design Checklist		✓
	VERIFY THE SKULL CAP IS FOR BIORID, AND THAT IT HAS THE CORRECT SIZE CABLE CLEARANCE SLOT. REFER TO GTR 19P01-2 AND 19P01-3	
	VERIFY SKULL AND CAP CONTAINS ERROR PROOFING PIN-HOLE COMBINATION. REFER TO GTR 19P01-2 AND 19P01-3	
	VERIFY THE CORRECT SIZE HOLES IN THE HEAD TO CLEAR THE FRONT CABLE ADJUSTERS (12.5 MM). REFER TO GTR 19P01-2 AND 19P01-3	
	VERIFY THE CORRECT HEAD IS INSTALLED (NON-SKULL CAP LOAD CELL VERSION). REFER TO GTR 19P01-2 AND 19P01-3	

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- ✓ Draft drawing package available on UNECE website
http://www.unece.org/trans/main/wp29/wp29wgs/wp29grsp/gtr7phase2_3_drawing_package.html
- Draft PADI available on UNECE website (TEGID-23)
- Check list included in PADI to check for correct build level

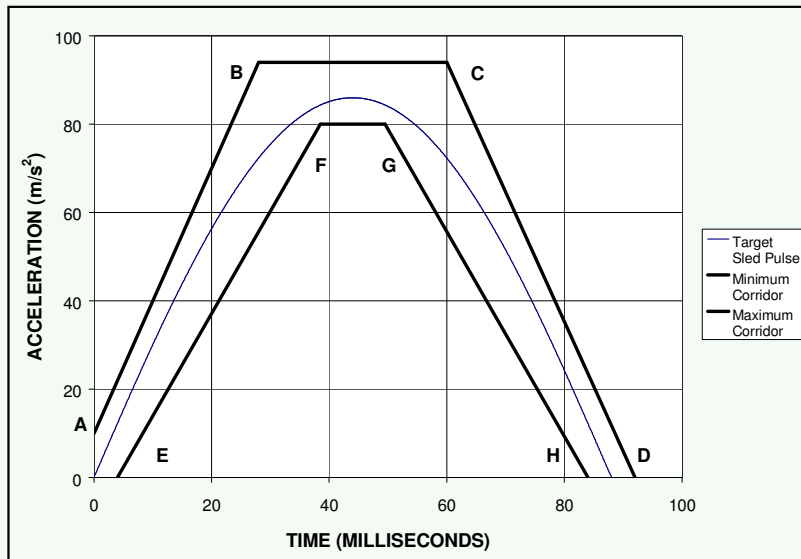
All dummy specifications need to be included into UN Mutual Resolution No. 1 (M.R.1)

M.R.1: „Concerning the description and performance of test tools and devices necessary for the assessment of compliance of wheeled vehicles, equipment and parts according to the technical prescriptions specified in UN Regulations and UN Global Technical Regulations”

New way of defining test tools for regulation!

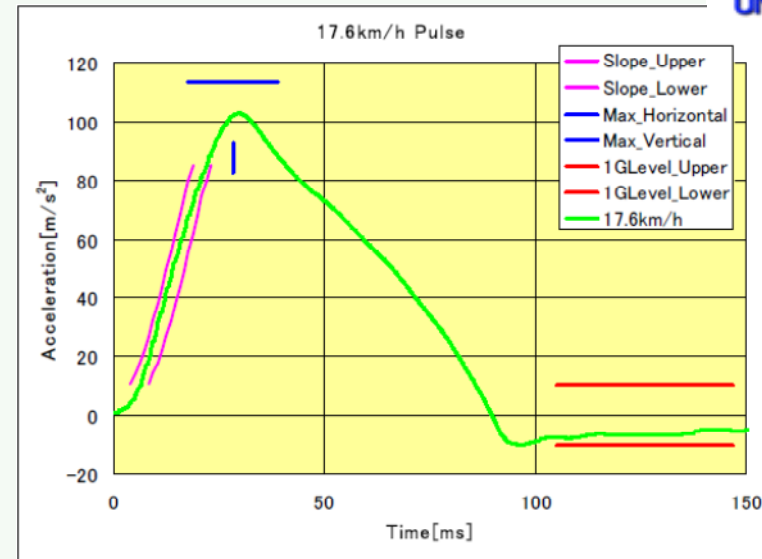
Link to M.R.1: <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html>

Test Pulse



D v = 17.3 kph +/- 0.6

**Current GTR No. 7 Annex 9
(Hybrid III)**



**New GTR No. 7 Phase 2
(BioRID II)**

EC/TRL–test series (beginning of 2012)

6 BioRID dummies (no. 006, 007, 028, 068, 077, 100)

Swapping of parts between dummies (e.g. spine, pelvis)

Acceleration sled, lab seat, draft GTR 7-pulse (JNCAP style)



Discovered problems which influence repeatability and reproducibility :

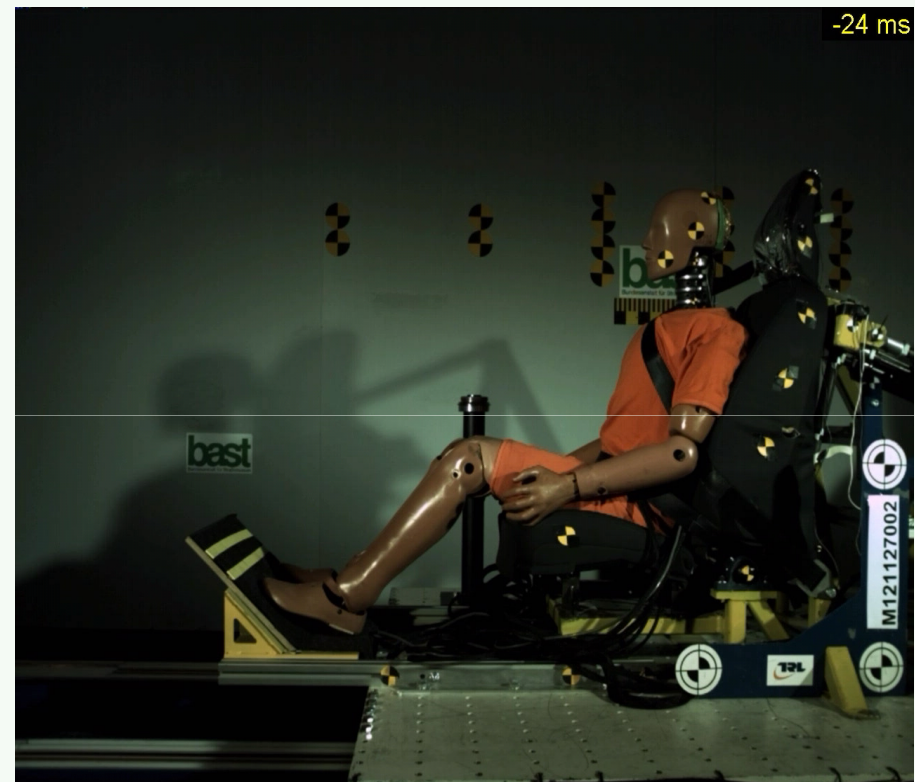
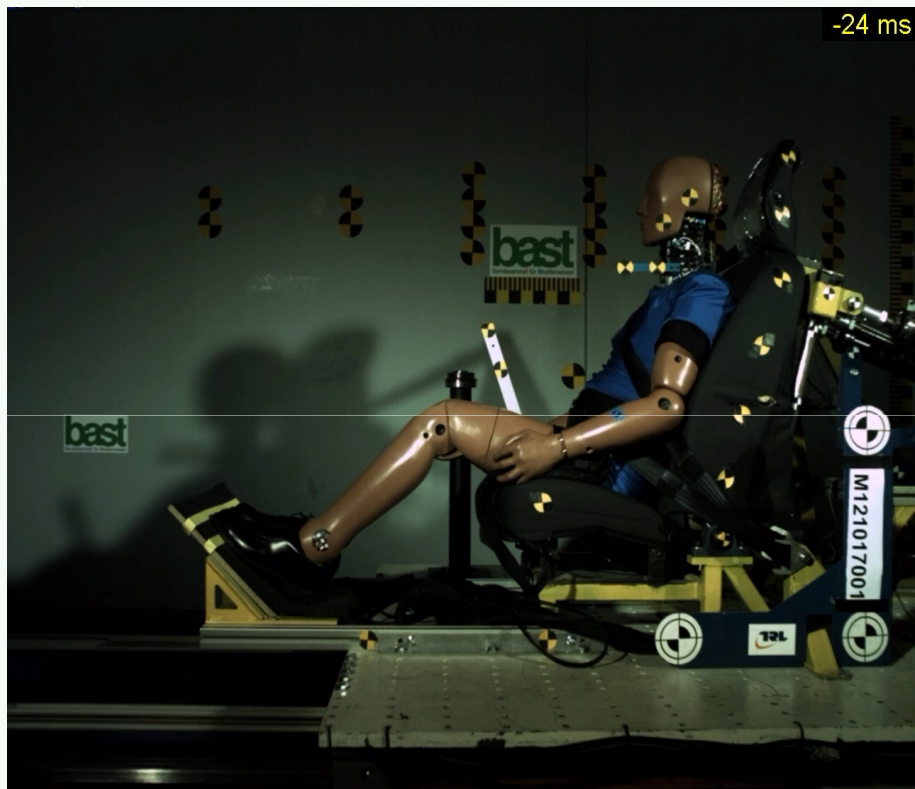
- Pelvis stiffness and possibly pelvis geometry
- Bumpers in spine
- Spine Stiffness
- Jacket

In general, good repeatability

Reproducibility partly poor

Additional test series at BAST (2012 / 2013)

4 refurbished BioRID dummies, 4 HIII dummies



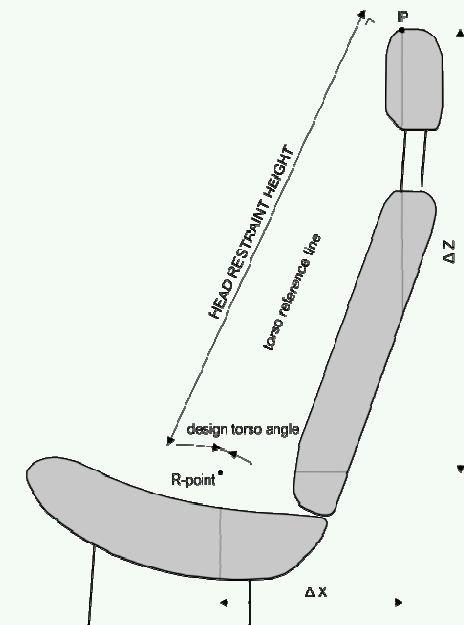
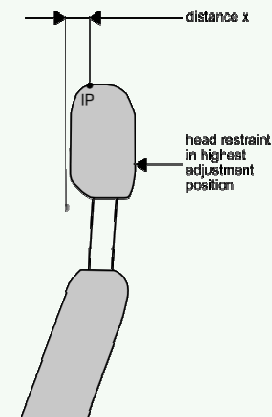
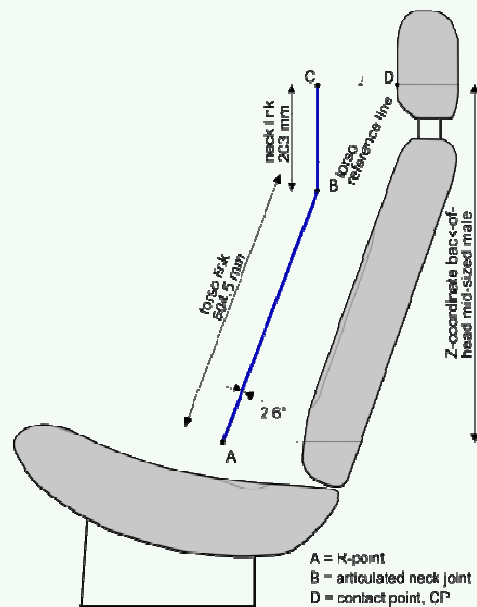
Data analysis of BioRID tests quite promising.

HIII tests show partly worse R&R than BioRID tests.

Additional BioRID certification tests and TRL lab seat tests with replaced neck bumper of different controlled stiffness performed in 2013.

Informal Working Group GTR 7 Phase 2: Head Restraint Systems

New static measurement procedure for determination of head restraint height and backset (w/o use of HRMD):



CP: contact point

IP: intersection point

Distance x: function of design torso angle

1st GTR No. 7 Workshop at BAST



- Concept agreed
- New text for GTR proposed
- Concept works for backset, too

-> HRMD no longer needed for static assessment
-> further investigations whether concept can be used for BioRID positioning, also!

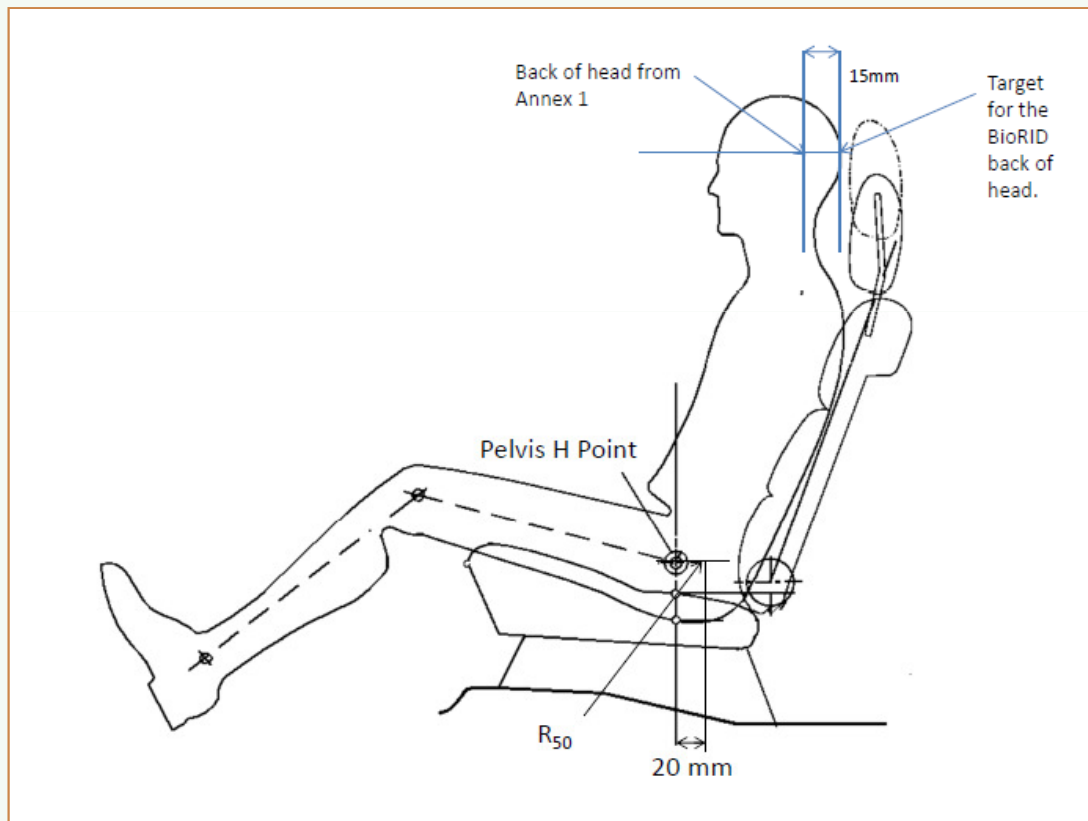
Fotos: B. Lorenz

- Difference between the static measurements and the dynamic test is the position of the seat.
- A new „reference point“ is needed as basis for a similar procedure as agreed for the static one

-> Introduction of the „R₅₀ point“

2nd GTR No. 7 Workshop @BAST

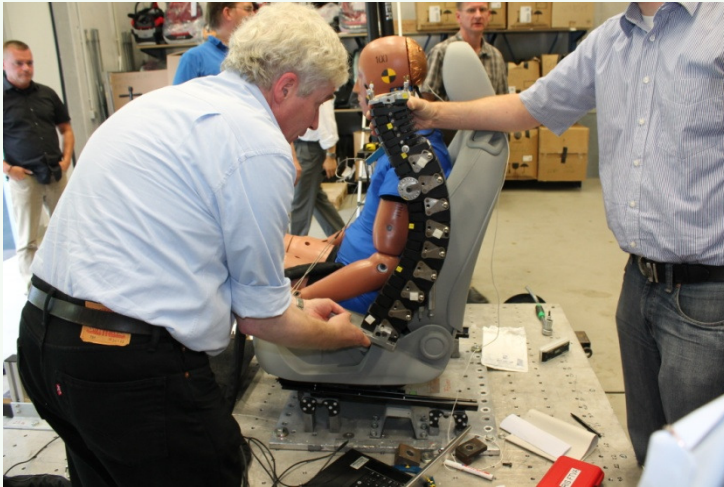
Introduction of the „R₅₀ point“



- Introduction of a new “designated H-point” for mid-size male seating position “R₅₀”.
- This data is provided by the manufacturer, allowing the seat to be adjusted to this point.
- Note: static measurement is made in a different seat set-up than for the dynamic test.
- “R₅₀” tolerance is checked by the H-point machine. If it lies within the 50 mm box it is this is the designated design point.

2nd GTR No. 7 Workshop @BAST

Impressions II



Fotos: B. Lorenz



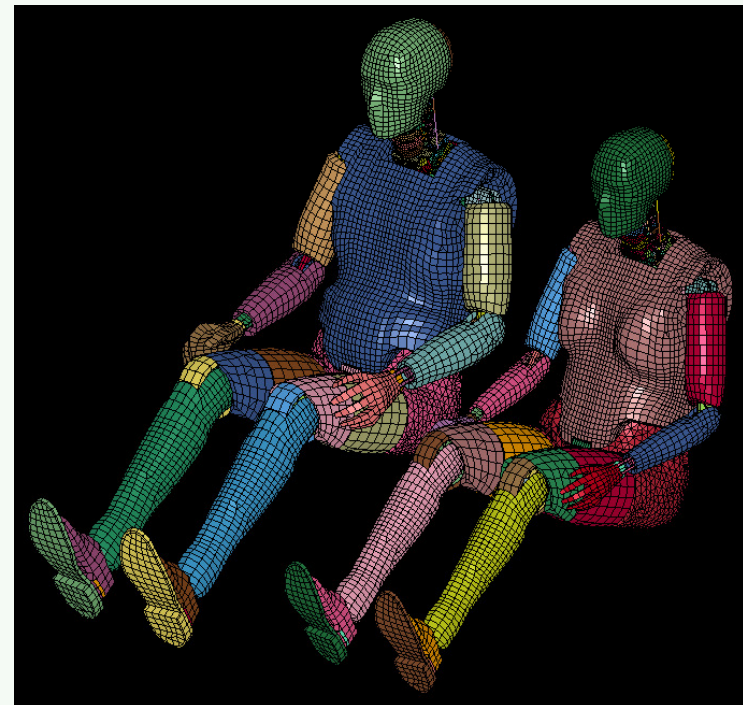
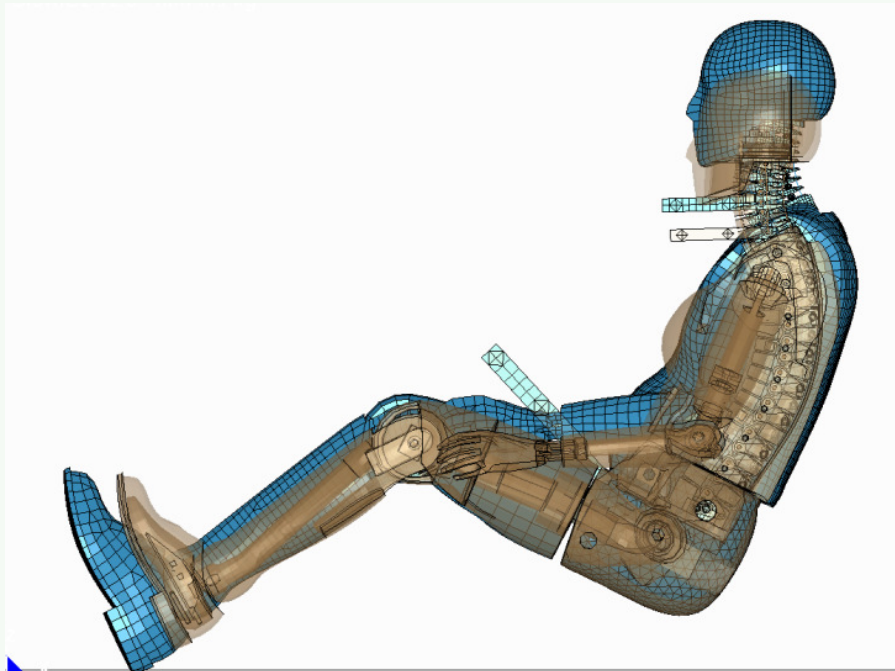
Issues to be solved / under discussion

- Injury Criteria / Seat performance Criteria: proposals made by NHTSA, Japan, Chalmers/Folksam at the September 2013 Gothenburg meeting; cadaver testing and data analysis at VRTC ongoing
- -> during an expert workshop on whiplash injury criteria on 8th/9th September 2014 (in advance of IRCOBI) an agreement was reached on a set of injury criteria candidates. Will be proposed to IWG GTR no. 7 in November.
- Proposals for new/updated certification test (“GEN-X “) from Humanetics” .
- Revised GTR 7 Phase 2 draft proposal shall be submitted to December 2014 GRSP. Official proposal to GRSP in May 2015.
- Head restraint height of 830 mm will be discussed further within GRSP
- Phase 2 - step 2: more upright seating position – further research needed



Adaptive seat to reduce neck injuries for female and male occupants

EvaRID



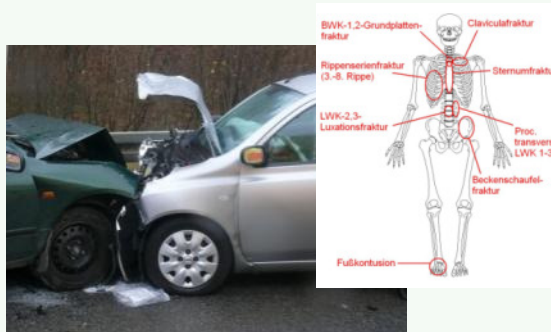
EU-Project ADSEAT



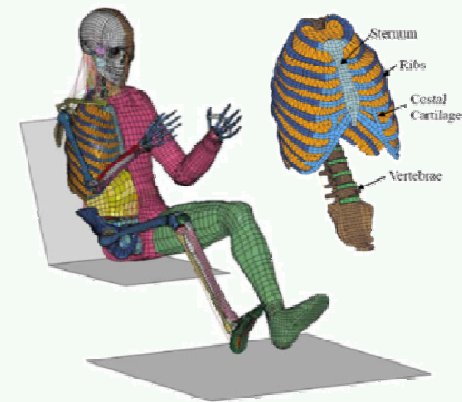
- Within ADSEAT several research questions were addressed e.g. accident data, injury criteria, testing, simulation
- At the Final Event which took place after a GTR no. 7 meeting in Brussels 2013 several members from contracting parties but also from Euro NCAP have been made aware of a female whiplash dummy and the higher risk of females which might be also caused by a seat design fossed on the 50% male.
- Euro NCAP will have a closer look during the inspections whether an increasing single point optimization on the 50% BioRID II can be noted. Whiplash testing and assessment shall be reviewed under this light for consumer testing as well as for regulation.

Example: challenges for passive safety due to the demographic change

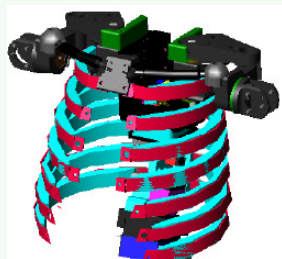
Analysis of the size of the problem on the basis of detailed in-depth accident data (GIDAS)



→ Elderly car occupants are often severely injured esp. in the thorax region during low severity accidents.



EU-research: participation in the THORAX project



Development of a new dummy thorax which represents better the elderly car occupant

Own research:

Modification of a human body model to explore the potential of protection of current cars for elderly occupants

Give advice to regulatory bodies (like Ministry of Transport BMVI) for and during the development of new test methods and performance criteria for UN regulations and GTRs

What are the needs?

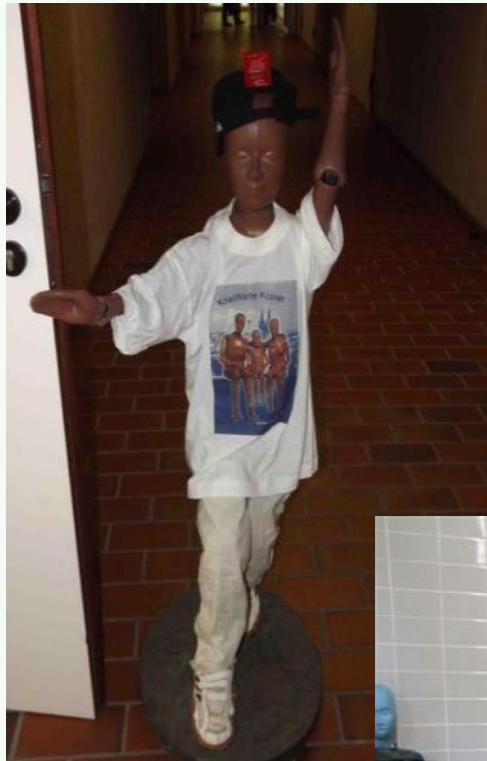


- (Improved) injury criteria child dummies esp. Q10 in side impact
- THOR 50%-M: a platform where research input is given with regard to injury criteria, R&R, improvements, certification etc.
- Interaction of car occupants during side impact
- Impact of the demographic change
- ?

- Having been very successful in reducing the number of road traffic victims during the last decades there are still too many people dying or are severely injured. The UN „decade“ is addressing this on high political level.
- For many European governments EU research programs are very important for regulatory activities as they do have only restricted resources available for regulatory activities.
- Consumer information programs like Euro NCAP are considering results from EC research projects (like FIMCAR, CASPER, THORAX, ADSEAT)
- The process for developing and passing a regulation within the framework of the UNECE is complex, long lasting and has many parties involved.
- There are sometimes the same stakeholders in EC research projects, regulatory activities and Euro NCAP.

- Global NCAP activities and new markets are leading to new safety requirements. The NCAPs of the world will harmonize their requirements only to a very limited degree.
- The input from the international research community like IRCOBI needs to be put forward to the working groups at UNECE in Geneva for the improvement and further development of regulations related to the protection of vehicle occupants and vulnerable road users.
- Euro NCAP has recently published its road map until 2020. One focus is on the interaction of vehicle occupants during side impact and another on the introduction of a new frontal impact test procedure including the THOR dummy.
- EEVC under its new regime is willing to play an important role and can act as an interface between research and regulatory activities as well as with regard to consumer protection programs.

Dummy-Museum @ BAST



Dummy-Museum @ BAST





**24th International Technical Conference on the Enhanced Safety of Vehicles |
JUNE 8-11, 2015 | GOTHENBURG, SWEDEN**

6th Student Safety Technology Design Competition 2015

- The abstract must outline the vehicle safety problem.
- The abstract must clearly identify the device or system that the team will build to address the safety problem outlined. It must also explain briefly how adoption of such a device or system could reduce the number of crashes, mitigate injuries, and/or prevent fatalities and injuries if deployed in vehicles and put into real-world operation in the fleet.
- **To be considered, the entry must be submitted electronically by e-mail SSTDC2015@dot.gov by October 29, 2014**
- **European Point of Contact (POC) : Bernd Lorenz**

Thank you for your attention !

