UN/ECE/WP29/GRSP Pedestrian Safety gtr Informal Group
2nd Interim Report

1. Introduction

- At the 33rd GRSP (2-6 June 2003) meeting, the informal group on pedestrian safety presented its first preliminary report as informal document 2. The document was adopted by GRSP and by WP29.
- The first preliminary report included amongst other:
  - Accident analysis looking at:
    - Overall pedestrian fatalities / injuries and their evolution over time
    - Distribution of injuries
    - Crash Speeds
  - The conclusions from this analysis were:
    - The majority of fatalities (numbers) and serious injuries occurred on:
      - Child head vs. top surface of bonnet/ wing.
      - Adult head vs. top surface of bonnet/wing + windscreen area and A-pillars,
      - Adult leg vs. front bumper of vehicles,
    - A crash speed (between a car and a pedestrian) of 40 km/h can cover more than 75% of total injuries including fatalities. Injuries caused by higher speed crashes will also be influenced positively by a reduction in injury severity.
  - The group also asked advice on the approach it took for the scope and is still awaiting clear directions from WP29.
- Based on this first preliminary report and on request of GRSP, the informal group continued its work and started with the development of a gtr.

2. Draft gtr proposal: working paper.

The working paper for the draft gtr can be found attached. The working paper is a mix of decided items and items that are still under study. An action plan is in place (see item 3) to provide answers for all the

questions that are left unanswered at this stage.

The preamble will be included in the first official draft gtr proposal to GRSP in December 2004. The preamble will include cost effectiveness/benefits conclusions, conflicts with other existing requirements, other measures that can be potentially reduce pedestrian injuries, etc.

- Legform test to bumper

  Either the lower or the upper legform test are required to be performed:

  - Lower legform to bumper
    - Impact zone: On the bumper
    - Impact speed of the impactor: 40 km/h
    - Test tool:
      - The existing lower legform impactor used in the EU

      Or

      - The FlexPLI legform developed in Japan.

      The group is undertaking further studies to enable a decision on the selection of the impactor.
    - Criteria:
      - dynamic knee bending angle < [21]°, maximum dynamic knee shearing displacement < [6]mm; acceleration < [200]g for the EU impactor

      Or

      - dynamic knee bending angle < [20]°, [maximum dynamic knee shearing displacement < [6]mm, acceleration < [200]g], tibia bending moment < [350] Nm for the FlexPLI impactor
  - [Upper legform to bumper (at the manufacturer request if the lower bumper height at the test position > 500 mm)
    - Impact zone: On the bumper
    - Impact speed of the impactor: 40 km/h
    - Test tool:
      - The existing lower legform impactor used in the EU
    - Criteria:
      - sum of impact forces < [7,5] kN; bending moment < [510] Nm]

- Child Head protection requirements
  - <u>Impact zone</u>
    - 1000 < WAD (Wrap Around Distance) < 1700

- Includes A-pillar/windscreen area

- Test tool
  - 165 mm diameter
  - 3,5 kg mass
- Impact speed of impactor: [32] km/h
- Impact angles

  Depends on vehicle shape (bonnet angle (BA), bonnet leading edge height (BLEH)):

Child	BLEH < 835 mm (Sedan)	BLEH > 835 mm (SUV)	BA > 30° (1 box)
Bonnet	65°	60°	25°
Windscreen	40°	40°	25°

- Criteria
  - HIC < [1000] for the child headform test area.
  - HIC < 1000 for the windscreen test area
  - The group agreed that the area required to meet HIC < 1000 may need revision and some consideration given to allow some exemption zones.

- Adult Head protection requirements
  - Impact zone
    - 1700 < WAD < 2100
    - Includes A-pillar/windscreen area
  - Test tool
    - 165 mm diameter
    - [4,5] kg mass
  - Impact speed of impactor

    [32] km/h
  - Impact angles

    Depends on vehicle shape (bonnet angle (BA), bonnet leading edge height (BLEH)):

Adult	BLEH < 835 mm	BLEH > 835 mm	BA > 30°
Bonnet	65°	90°	50°
Windscreen	40°	40°	50°

  - Criteria
    - HIC < [1000] for the child headform test area.
    - HIC < 1000 for the windscreen test area

- The group agreed that the area required to meet HIC < 1000 may need revision and some consideration given to allow some exemption zones.

- Adult Upper Leg protection requirements:

  The group agreed that inclusion of the upper leg test to the bonnet leading edge needed further review. In particular it must be verified whether this test is actually needed on the basis of accident data, technical feasibility, test procedure repeatability, reproducibility, etc.

3. Action plan

- General time schedule:

- draft gtr (based on updated PS/69) to May 04 GRSP. To serve as basis for the feasibility / effectiveness / repeatability / reproducibility assessment and resulting in

- first official draft gtr to Dec 04 GRSP. To serve as basis for comments from all CPs and industry and resulting in

- official draft gtr to May 05 GRSP for final adoption at AC3 in November 05.

- The action plan as agreed during the 6th informal group meeting (see also INF / GR / PS / 83)

For the head test area proposal including the windscreen and A-pillars: Need for more test data (all) Japan to provide J-NCAP data + proposal
Governments to make a recommendation on the selection of the impact points based on their own national / regional approach (recommended impact points versus free selection (worst case) by test house)
Head impact speed: EU and US study reservation: NHTSA to check if more information is available + EU to study results of PS/72.
EU study reservation for specifications of the 3,5 kg headform and for the weight of the adult headform.
Headforms: Accelerometer position accuracy under discussion in J and US. Any info from other source is welcome.
Head impactor skin ageing under study (J)
Head impactors: bring together certification data and check the response uniformity (J, IDIADA).
Include the certification test established by IHRA (PS/49 and PS/50) in the draft gtr.
OICA to give comments on a proposal for an active bonnet test method.
In order to decide which legform to be used we need by **Sept 04**: - IHRA to finalise its work asap (corridors, injury risk curves, …). (Summer 04) - info on repeatability and reproducibility of EU legform (EEVC) / FlexPLI (J) - biofidelity information of FlexPLI (J) / EU impactor (EEVC)

- comparison result after test on same car of FlexPLI versus EU impactor (J to provide info on 2 cars) - information on general availability of FlexPLI (J) - information on sensitivity, durability, … - information on the certification procedures and specifications for each impactor (J, EEVC)
Results of ACEA study on feasibility (EU Phase 2) will be available next meeting. JAMA to check if J mfr can provide feasibility test data. EU feasibility study result will be available next meeting. Korea will check if KAMA has information to share.

4. Attachment

* Working paper for the draft gtr

* All documents used by the informal group can be found on the UN/ECE/WP29/GRSP website. For reference the complete list of working documents is attached:

Number	**Title**
INF GR/PS/1*	Agenda 1st meeting
INF GR/PS/2	Terms of reference
INF GR/PS/3	IHRA accident study presentation
INF GR/PS/4*	JMLIT proposed legislation
INF GR/PS/5	IHRA feasibility study
INF GR/PS/6	J information on possible scope
INF GR/PS/7	Attendance list 1st meeting
INF GR/PS/8*	Draft Meeting Minutes 1st meeting
INF GR/PS/9*	Report to GRSP 32 inf doc
INF GR/PS/10	Draft action plan
INF GR/PS/11	Agenda 2nd meeting
INF GR/PS/12	GIDAS accident data
INF GR/PS/13	GIDAS accident data graphs
INF GR/PS/14	Italian accident data
INF GR/PS/15	UN accident data
INF GR/PS/16	Spanish accident data
INF GR/PS/17	ACEA accident data
INF GR/PS/18	Draft Meeting Minutes 2nd meeting
INF GR/PS/19	Agenda 3rd meeting
INF GR/PS/20	Canadian accident data

INF GR/PS/21	Netherlands accident data
INF GR/PS/22	Scope overview
INF GR/PS/23	Draft content table preliminary report
INF GR/PS/24	Attendance list 3rd meeting
INF GR/PS/25	GIDAS presentation
INF GR/PS/26	Leg injuries ITARDA
INF GR/PS/27*	Draft Meeting Minutes 3rd meeting
INF GR/PS/28	Technical feasibility general
INF GR/PS/29	Infrastructure effectiveness
INF GR/PS/30	Pelvis / Femur fracture
INF GR/PS/31	IHRA/PS-WG Pedestrian accident data
INF GR/PS/32	ESV summary paper on IHRA/PS-WG report
INF GR/PS/33	Introduction of the regulation od pedestrian head protection in Japan; Nishimoto, Toshiyuki
INF GR/PS/34	Proposal for a directive of the European Parliament and the Council relating to the protection of pedestrians and other vulnerable road users in the event of a collision with a motor vehicle and amending Directive 70/156/EEC; Commission of the European Communities, Brussels, February 2003
INF GR/PS/35	List of conflicts with existing legislation / requirements
INF GR/PS/36	Draft preliminary report
INF GR/PS/37	Agenda 4th meeting
INF GR/PS/38	Technical prescriptions concerning test provisions for pedestrian safety
INF GR/PS/39*	Vehicle safety standards report 1
INF GR/PS/40	US Cumulative 2002 Fleet GVMR
INF GR/PS/41	Swedish accident data
INF GR/PS/42	TRANS/WP.29/GRSG/2003/10 proposal for common definitions
INF GR/PS/43	Category 1-1 GVM
INF GR/PS/44	Light duty truck
INF GR/PS/45	EURO-NCAP results and what they mean in relation to EU Phase 1
INF GR/PS/46	JAMA / JARI child and adult head impactors
INF GR/PS/47*	Preliminary report to GRSP 33
INF GR/PS/48*	Draft meeting minures 4th meeting

INF GR/PS/49	IHRA child head test method
INF GR/PS/50	IHRA adult head test method
INF GR/PS/51	Attendance list 4th meeting
INF GR/PS/52	Provisional agenda for the 5th meeting
INF GR/PS/53	Draft gtr format
INF GR/PS/54	gtr proposal to WP29
INF GR/PS/55	Draft gtr
INF GR/PS/56*	Comparison table
INF GR/PS/57	Proposed schedule of the group
INF GR/PS/58	Presentation on veh shape, bound line, ...
INF GR/PS/59	A-pillar IHRA OICA presentation
INF GR/PS/60	ISO/TC22/SC10/WG2 N613
INF GR/PS/61	IHRA PS 237
INF GR/PS/62	Action plan from 5 meeting
INF GR/PS/63	Attendance list 5th meeting
INF GR/PS/64*	Draft meeting minutes 5th meeting
INF GR/PS/65*	Provisional agenda for the 6th meeting
INF GR/PS/66	AUS-NCAP pedestrian data
INF GR/PS/67	Test-method - active hood / bonnet systems
INF GR/PS/68	Target population head injuries - US
INF GR/PS/69	Working paper draft gtr
INF GR/PS/70	Korean information
INF GR/PS/71	Head test area windscreen + A-pillar
INF GR/PS/72	Head test data on windscreen
INF GR/PS/73	Head impact angle / speed re-assessment based on vehicle geometry
INF GR/PS/74	IHRA/PS/270 headform impactor specification
INF GR/PS/75	Powerpoint explanation of PS/67
INF GR/PS/76	IHRA legform discussions
INF GR/PS/77	Corridors proposed by UVA (lower legform)
INF GR/PS/78	Bio rating method: Maltese
INF GR/PS/79	IHRA antropometric proposal
INF GR/PS/80	IHRA/PS/278
INF GR/PS/81	Schedule for legform impactor for gtr
INF GR/PS/82	Injury threshold for ped legform test
INF GR/PS/83	Decided items and action items of the 6th meeting

INF GR/PS/84	Draft meeting minutes of the 6th meeting
INF GR/PS/85	Attendance list of the 6th meeting
INF GR/PS/86	Draft gtr EU working document
INF GR/PS/87	IHRA PS 273 Development of FlexPLI2003
INF GR/PS/88	Second interim report to GRSP 35