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PRELIMINARY REPORT ON THE DEVELOPMENT OF A GLOBAL TECHNICAL
REGULATION CONCERNING PEDESTRIAN SAFETY

Transmitted by the Working Party on Passive Safety (GRSP)

Note: This document contains a preliminary report on the development of a global technical regulation (gtr) concerning pedestrian safety by the GRSP informal group in charge of the development of the gtr. It is based on the text of a document distributed without symbol (Informal document No. 5) during the one-hundred-and-thirtieth session (TRANS/WP.29/926, para. 130).

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<http://www.unece.org/trans/main/welcwp29.htm>

PRELIMINARY REPORT

1. INTRODUCTION

1.1. SET-UP OF GRSP AD HOC GROUP BY GRSP/WP29

During the one-hundred-and-twenty sixth session of WP.29 in March 2002, AC.3 concluded their considerations of priorities for developing future global technical regulations. WP.29 adopted the 1998 Global Agreement Program of Work, which included pedestrian safety and decided to start the work on pedestrian safety in the thirty-first session of GRSP in May 2002, by creating an informal group to draft the gtr.

1.2. MANDATE

Informal document 10 of the thirty-first session of GRSP lays down the terms of reference of the group and the document was adopted by GRSP. (INF GR / PS / 2)

1.3. NUMBER OF MEETINGS

The group has held four meetings:

- 4-5 September 2002, Paris
- 10 December 2002, Geneva
- 15-16 January 2003, Santa Oliva
- 15-16 May 2003, Tokyo

1.4. PARTICIPANTS

The meetings were attended by representatives of:

The Netherlands, France, Germany, Canada, EU, Spain, Japan, USA, Italy, EEVC, CI, CLEPA and OICA.

The meetings were chaired by Mr Mizuno (Japan) and Mr Friedel / Mr Cesari (EU) whilst the Secretariat was provided for by Mr Van der Plas (OICA).

1.5. STATUS

This report responds to paragraph 5. of documents TRANS/WP.29/2002/24 and TRANS/WP.29/2002/49 as adopted by AC.3 and endorsed during the one-hundred and twenty-seventh session of WP.29. The documents were consolidated in the final document TRANS/WP.29/882.

1.6. FUTURE STEPS

Due to the time schedule and the nature of the discussions, preliminary discussions on the content of the gtr have already begun. According to the assigned Terms of Reference, the Pedestrian Safety gtr informal group should make a final proposal to GRSP before spring 2005. To do so, the group should prepare its draft proposal to GRSP before autumn 2004.

2. ACCIDENT ANALYSIS

2.1. OVERALL PEDESTRIAN FATALITIES / INJURIES AND THEIR EVOLUTION OVER TIME

The Pedestrian Safety gtr Informal Group tried to accumulate all available pedestrian traffic accident data.

As result, the group received pedestrian accident databases from the IHRA/Pedestrian Safety WG (comprehensive in-depth accidents study - INF GR/PS/3-31), German accident data (INF GR/PS/12-13-25), Italian data (INF GR/PS/14), UN accident data (INF GR/PS/15), Spanish data (INF GR/PS/16), European Industry's data (INF GR/PS/17), Canadian data (INF GR/PS/20), Netherlands data (INF GR/PS/21) and Swedish data (INF GR/PS/41).

The most in depth accident data came from the IHRA/PS-WG, but all the above mentioned data supports the same trends seen in the IHRA/PS study.

The UN statistics for pedestrian traffic accidents show a decrease in the fatality and injury numbers of 30 to 40 per cent over the last 20 years, but absolute numbers are still important enough to make some actions.

2.2. DISTRIBUTION OF INJURIES

Comparing the ages, statistics show the highest frequency of accidents is for children of 5 to 9 years old, and for adults over 60 years old.

According to the in-depth study of the IHRA/PS-WG, the frequency of fatal and serious injuries (AIS 2-6) is highest for following body regions: head injuries for adult and child, and leg injuries for adult.

Each of these body regions covers more than 30 per cent of total accidents and the group believes it should focus on protecting these body regions.

The highest next to head and leg injuries are chest injuries with about 10 per cent. Other injured body regions are much lower with only a few percents.

For the vehicle parts, the major sources of adult head injuries are the top surface of bonnet/wing and windscreen area and A-pillars. For the child head injury, this is the top surface of the bonnet / wing. For the adult leg injury, the major source is the front bumper of vehicles. (INF GR/PS/3-31).

Spanish accident data (INF GR/PS/16) based on severe accidents showed that head, legs and thorax are the first priority when combining severity and frequency of injuries.

2.3. CRASH SPEEDS

Pedestrian accident data for crash speed between vehicles and pedestrians are collected and the cumulative frequency of the crash speeds shows that a crash speed of up to 40 km/h can cover more than 75 per cent of total pedestrian accidents (INF GR/PS/3-31). See also chapter 4.1.

CONCLUSION: JUSTIFICATION / NO JUSTIFICATION TO WORK ON PEDESTRIAN SAFETY

The Pedestrian Safety gtr Informal Group collected all available traffic accident data for pedestrians from all available sources.

Based on these accident data, the Informal Pedestrian gtr Safety Group concludes and recognizes that:

- i. The majority of fatalities (numbers) and serious injuries occurred on:
 - Child head versus. Top surface of bonnet/ wing.
 - Adult head versus top surface of bonnet/wing + windscreen area and A-pillars,
 - Adult leg versus. Front bumper of vehicles,
- ii. A crash speed (between a car and a pedestrian) of 40 km/h can cover more than 75 per cent of total injuries including fatalities. Injuries caused by higher speed crashes will also be influenced positively by a reduction in injury severity.

3. EXISTING OR FUTURE NATIONAL / REGIONAL LEGISLATIVE ACTION PLANS

During the discussion in the ECE/GRSP Informal Group on pedestrian safety drafts of regulation for the protection of pedestrians in a collision with a motor vehicle are published by the Japanese Government and by the Commission of the European Communities.

3.1. SITUATION IN JAPAN

Pedestrian fatalities account for about 30 per cent of all traffic fatalities in Japan. The new regulation is addressed to the protection of the head and the outline is as follows:

i. Scope of vehicles

- Passenger cars having no more than 10 seats
- Trucks having a GVW not exceeding 2,500kg and a similar front shape as the passenger cars above-mentioned

ii. Effective Date

- Vehicles except for vehicles defined in the next indent
 - New-type vehicles: September 2005
 - Continuously-manufactured vehicles: September 2010
- Low height vehicles, Vehicles requiring high endurance, such as SUVs and trucks, Full cab over vehicles, Hybrid-engine vehicles
 - New-type vehicles: September 2007
 - Continuously-manufactured vehicles: September 2012

iii. Outline of the regulation

Test Procedure

a) Test area

The child and adult head impactor test will be considered for the regulation.

Test area for child head impactor: $1,000\text{mm} \leq \text{WAD} \leq 1,700\text{mm}$

Test area for adult head impactor: $1,700\text{mm} \leq \text{WAD} \leq 2,100\text{mm}$

Note: WAD (Wrap-Around Distance) means the distance from the ground to the point on the bonnet along the vehicle front structure.

b) Impactor (See appendix 3)

Child head impactor: Diameter 165mm, weight 3.5kg

Adult head impactor: Diameter 165mm, weight 4.5kg

c) Impact speed and angle

	Child head impactor		Adult head impactor	
	Speed (km/h)	Angle (deg)	Speed (km/h)	Angle (deg)
Category 1	32	65	32	65
Category 2	32	60	32	90
Category 3	32	25	32	50

(Above head impact conditions were estimated from the IHRA car-pedestrian 40 km/h impact computer simulation results)

	Definition	Note
Category 1	Vehicle having a BLE height of less than 835mm	Sedan type
Category 2	Vehicle having a BLE height of not less than 835mm	SUV type
Category 3	Vehicle having a bonnet angle of not less than 30 deg.	1 Box type

Note: BLE height: Bonnet Leading Edge height

Criteria

HIC (Head Injury Criteria), defined by the following formula, should not exceed 1,000 on two-thirds or more of the test area. On the remaining area, HIC should not exceed 2,000.

In appendix 1 of the regulation the Draft test procedure is illustrated, in appendix 2 the test area is specified as well as the bonnet leading edge reference line, in appendix 3 the specifications and certification test of head form impactors are outlined.

Japan has already indicated that a next step will include requirements for the lower leg. In order to achieve this, Japan will use the content of the gtr as its next step in legislation. For more details see INF GR/PS/33.

3.2. SITUATION IN THE EU

About 8,000 pedestrians and cyclists are killed and a further 300,000 injured in the European Community each year in road accidents. On 19 February, 2003 the European Commission voted to adopt a draft proposal for a Directive on Pedestrian Protection which would be presented to the Council and European Parliament.

The contents of the proposal are based on the industry commitment, on the scientific work performed by Working Group 17 of the European Enhanced Vehicle-safety Committee (EEVC) and the Joint Research Centre (JRC) of the European Commission.

This proposal lays down technical requirements for the type approval of motor vehicles with regard to pedestrian protection. The proposed measures apply to passenger cars and car-derived vans (category M1, of a total permissible mass not exceeding 2.5 tonnes, and N1 derived from M1, of a total permissible mass not exceeding 2.5 tonnes).

As the construction of passenger cars is covered by Community legislation under the EC whole vehicle type approval system set up by Directive 70/156/EEC, as amended, the proposed requirements will also be incorporated into this system.

The technical provisions are described in appendix 1 of the proposal. The proposed basic requirements will be tested according to detailed prescriptions which will be set out in a Commission decision.

In a first phase, starting in 2005, new types of vehicles must comply with two tests concerning protection against head injuries and leg injuries:

- Legform to Bumper: One of the two following legform tests are required to be performed:

- Lower legform to bumper: The test is performed at an impact speed of 40km/h. The maximum dynamic knee bending angle shall not exceed 21.0°, the maximum dynamic knee shearing displacement shall not exceed 6.0mm, and the acceleration measured at the upper end of the tibia shall not exceed 200g

- Upper legform to bumper: The test is performed at an impact speed of 40km/h. The instantaneous sum of the impact forces with respect to time shall not exceed 7.5kN and the bending moment on the upper legform impactor shall not exceed 510Nm.

● Child/Small Adult headform to bonnet top: The test is performed at an impact speed of 35 km/h using a 3.5 kg headform impactor with a diameter of 165 mm. The Head Performance Criterion (HPC) shall not exceed 1000 over 2/3 of the bonnet test area and 2000 for the remaining 1/3 of the bonnet test area.

In Phase 1 the following tests are required for monitoring purposes only:

● Upper legform to bonnet leading edge: The test is performed at an impact speed up to 40 km/h. The instantaneous sum of the impact forces with respect to time should not exceed a possible target of 5.0 kN and the bending moment on the upper legform impactor shall be recorded and compared with the possible target of 300 Nm.

- Adult headform to windscreen: The test is performed at an impact speed of 35 km/h using a 4.8 kg headform impactor. The Head Performance Criterion (HPC) shall be recorded and compared with the possible target of 1000.

In a second phase, starting in 2010, four tests of increased severity according to the recommendations by EEVC will be required for new types of vehicles, two tests concerning head injuries and two concerning leg injuries. Within five years all new vehicles will have to comply with these test requirements.

- Legform to Bumper:
 - One of the two following legform tests are required to be performed:
 - Lower legform to bumper: The test is performed at an impact speed of 40km/h. The maximum dynamic knee bending angle shall not exceed 15.0°, the maximum dynamic knee shearing displacement shall not exceed 6.0mm, and the acceleration measured at the upper end of the tibia shall not exceed 150g.
 - Upper legform to bumper: The test is performed at an impact speed of 40 km/h. The instantaneous sum of the impact forces with respect to time shall not exceed 5.0kN and the bending moment on the upper legform impactor shall not exceed 300Nm.
 - Child headform to bonnet top: The test is performed at an impact speed of 40km/h using a 2.5kg headform impactor with a diameter of 130 mm. The Head Performance Criterion (HPC) shall not exceed 1000 for the whole of the bonnet test area.
 - Adult headform to bonnet top: The test performed at an impact speed of 40km/h using a 4.8kg headform impactor with a diameter of 165 mm. The Head Performance Criterion (HPC) shall not exceed 1000 for the whole bonnet test area.
 - Upper legform to bonnet leading edge: The test is performed at an impact speed up to 40km/h. The instantaneous sum of the impact forces with respect to time shall not exceed 5.0kN and the bending moment on the upper legform impactor shall not exceed 300Nm.

Pedestrian protection objectives can be achieved by active or passive safety measures. Considering the speed of technological development in this area, this proposal foresees that alternative measures to the requirements laid down in the proposal might be developed. A feasibility assessment will therefore be carried out by 1 July 2004 concerning the proposed technical test provisions and in particular other measures which potentially may have at least equal protective effects to those proposed. Should the feasibility assessment show that these alternative measures have at least equal protective effects the Commission shall consider relevant proposals to amend this Directive.

Concerning the withdrawal of rigid bull bars, following the views expressed by the Council and the European Parliament, suggesting that a legislative approach would cover not only the original equipment manufacturers but also the independent after-market, the Commission intends to propose a Directive containing a test procedure for all bull-bars and similar devices placed on the market.

For more details see INF GR/PS/34.

3.3. SITUATION IN OTHER COUNTRIES

Canada is currently reviewing their bumper regulation. The Canadian bumper regulation is one if not the most stringent in the world (all the safety features of the vehicle have to be functional after an 8 km/h impact). Canada needs to investigate the effect of the Canadian bumper designs on pedestrian safety.

The US terminated development of a pedestrian head impact requirement in the early 1990's. Since that time, the US efforts have been focused on research in support of the IHRA pedestrian safety working group.

If other countries start working on pedestrian safety and are able to share their work with the Pedestrian Safety gtr Informal Group, it will be taken into account in future discussions.

3.4. SCOPE FOR HARMONISATION

The accident data show us that in addition to the EU and Japan, other countries (e.g. Australia and South Korea) also suffer high pedestrian fatalities. Establishing a gtr (with harmonized tools, methods and level of protection) offers the opportunity not only to align existing requirements (in the EU and Japan) but also to potentially lower pedestrian injuries worldwide.

It is the intention of Japan to use the content of the gtr for their next step in their national legislation. Also the second phase of the EU provisions offer the possibility for alignment with the gtr.

4. PARAMETERS TO BE TAKEN INTO ACCOUNT

4.1.1. ACCIDENTOLOGY

Based on the IHRA accident study (INF GR/PS/3-31) the group concluded that:

- Head and leg are the most injured body regions
- Child head mostly injured by the top surface of the bonnet
- Adult head mostly injured by the windscreen area and the A-pillars and top surface of the bonnet / wing as additional important sources
- Adult leg mostly injured by the bumper

This was confirmed by additional recent data (INF GR/PS/25, INF GR/PS/30) from which the group concluded that head tests on the bonnet and lower leg tests need to be included. The bonnet leading edge appears not to be a priority concern at this time.

Spanish accident data (INF GR/PS/16) showed that head and thorax are the first priority for severity and the extremities for the frequency of the injuries.

Results from a Japanese ITARDA study on leg injuries (INF GR/PS/26) showed that it is necessary to protect both the tibia and the knee joint. As a consequence it was deemed necessary to look into a new lower legform developed by JARI. This new lower legform would make it possible to assess the injury risk of both the tibia and the knee joint.

Based on accident statistics the group agreed the target car to pedestrian crash speed should be 40 km/h. This will cover more than 75 per cent of total pedestrian accidents (INF GR /PS/3- 31).

4.2. RELEVANCE (FULL SCALE / SUBSYSTEM)

The group agreed that a simple, reliable, repeatable test is better for legislation. For research simulation, PMHS and a pedestrian dummy can be very helpful to assess injury tolerances and kinematics.

However, simulation could be of assistance in the selection of the most severe impact point.

The general conclusion thus was that sub system tests are the best way forward.

4.3. SCOPE (CATEGORIES / SHAPES)

Vehicle shape is important and is studied by the IHRA PS WG for passenger cars. The group agreed to use this work as basis. It influences the speed and angle of the head test conditions. It needs to be checked how light trucks / vans / exotic shapes can be included (if not included yet). If additional shapes are identified to which the sub system tests have not been validated, this should be taken into account. The importance of shape can be further addressed in the test procedure specifications.

The group also gave consideration to the existing work underway in relation to the drafting pedestrian legislation. The different approaches used in achieving a definition of the scope present a challenge. Legitimate concerns on the fleet differences of the Contracting Parties were raised such as the limitation of passenger cars by weight or by the number of seating positions, or the market importance of a vehicle category in one country whilst the same vehicle category is virtually non existent in others.

In an attempt to cover for all these concerns a matrix was proposed. The headings would cover all categories considered necessary by the group. It was recognised that these fleet differences may require sub-classifications of the proposed GRSG definitions in this gtr proposal. The group wants to stress that the intention clearly would be to comply with the GRSG Common Tasks categories when approved by WP.29.

A possible approach for the application of the matrix could list all the tests the group would agree upon. It was recognised that technical feasibility will be critical in establishing the application of these tests. Hence a staged approach with a possible distinction in the application date could be included in the proposed gtr tests.

Each Contracting Party signing up to the gtr would then be listed in this matrix indicating which test for which category they require. This could be seen as different levels of application.

Rather than having a national option to extend the scope outside the scope of the gtr, this solution would provide for all options within the gtr.

Example of the matrix:

	Cat X	Cat Y	Cat Z	..
gtr test A	CP α , CP β , CP ω	CP δ		
gtr test B	CP α , CP β	CP δ		
gtr test C		CP δ	CP ω	
...				

Example: Cat X = Category 1-1 < 2,5 tonnes GVM of TRANS/WP.29/GRSG/2003/10

Cat Y = Category 1-1 of TRANS/WP.29/GRSG/2003/10

Cat Z = Definition to cover for the US pick-up trucks

The group also agreed that the scope should presently be limited to new types of vehicle only since the necessary technical changes to the vehicle needed for achieving the high level of protection can only reasonably be incorporated into a vehicle during the development of a new type.

The group requests consideration and guidance from GRSP on this proposed approach.

4.4. BENEFITS (MONETARY, SOCIAL)

It was considered that a cost study can only be done in a pragmatic way. It was tried within EEVC and even within the EU but it was not possible because of, amongst others, the differences in the hospital care system. It can only be done as examples for separate countries. The other option would be to use an idealized standard. Members of the group also referred to three papers that were produced based on the EEVC reports. These cost effectiveness studies are from BAST, the Netherlands and MIRA and could be provided to this group.

However the group would request guidance from WP.29 on what monetary value has to be used since different regions use different values, and also guidance on cost benefit procedures methods.

4.5. COST FEASIBILITY (TECHNICAL, OTHER REASONS)

The group already took note of the feasibility study performed in IHRA (INF GR/PS/5) on the IHRA proposed head tests. The main conclusions are:

- No vehicle fulfils EEVC/WG17 requirements completely
- No traditional solution currently exist to pass EEVC/WG17 requirements (not possible with padding only)
- No sensor techniques are available yet to offer other solutions

The group will also check with various NCAP programs around the world if data from their tests could give an insight in the feasibility of certain pedestrian tests. As more tests are performed by these NCAP programs, the results will be fed into the discussions of the Pedestrian Safety gtr Informal Group.

As the group reaches conclusions on various parts of the proposed tests for the draft gtr, more feasibility studies / assessments will have to be performed by the group members, taking into account the latest technological developments.

4.6. CONFLICTS WITH EXISTING LEGISLATION / REQUIREMENTS

During the preliminary activities of the informal group, it was generally recognized that any future proposed legislative requirements on pedestrian protection should be assessed against other vehicle parameters.

OICA pointed out that both existing and future vehicle requirements should be taken into account, internationally as well as nationally, to ensure that potential conflicts are reduced as much as possible. OICA also stressed that, in addition to legislative requirements, other vehicle parameters also need verification, in terms of customer satisfaction, repairability, insurance classification, comfort, handling, etc.

The group asked OICA to prepare such a list of all necessary parameters for evaluation for inclusion in this report. OICA consequently provided the input attached as INF GR/PS/35.

5. REQUEST FOR ADDITIONAL RESEARCH AND TESTING

The group was informed about research ongoing in Japan on the development of a new and more biofidelic lower legform (including features such as bendable bones). The group sees this as a part of research which has the possibility to further improve the protection of the lower leg and the group will take the outcome of this research into account in its discussions.

The group also recognizes the importance of the work underway in IHRA and will use this as basis for its discussions. The IHRA proposals are based on input from the relevant ISO and EEVC working groups.

6. CONTENTIOUS ISSUES

Referring to item 4.4 above, the group requests guidance from WP.29 on what monetary value has to be used since different regions use different values. In addition guidance is needed on the cost benefit procedures / methods as described in document TRANS/WP.29/882 paragraph 7: "In the case of a new gtr, the Working Party must give consideration to the technical and economic feasibility, the benefits and potential cost effectiveness, including those of any alternative regulatory requirements and approaches."

Also guidance on the proposed approach taken on the scope (see item 4.3) is deemed useful.

7. OTHER MEASURES THAT CAN POTENTIALLY REDUCE PEDESTRIAN INJURIES

The group, taking note of the terms of reference, also reviewed the issue of other safety measures besides passive safety measures on the vehicle itself.

The group recognized that active safety measures are not within its field of competence but at the same time agreed that such issues should be brought to the attention of WP29 and AC.3.

As pointed out by several experts, including OICA, pedestrian protection could be considered as a whole, including active and passive measures. Some experts noted that consideration of other safety measures might help in ensuring that the vehicle passive safety requirements are kept at a realistic and feasible level.

OICA, in particular, mentioned brake assisting systems which can, in emergency situations, substantially improve the braking performance and consequently reduce the impact speed when the impact is unavoidable.

OICA also pointed to the importance of the infrastructure and presented the results of a 1998 study conducted on behalf of ACEA by the consultants ORIENTATIONS (F) and TMS Consultancy (UK) – INF GR/PS/29. This study, which evaluated the effect of infrastructural measures based on real data evaluations, concluded that such measures could dramatically reduce the number of pedestrian victims (fatalities/injuries) at low cost.

While it was agreed that such infrastructure measures are not within the remit of the group, it was also agreed that it could be useful and efficient to inform WP.29 as well as other authorities of the need to take these issues into account for real world safety improvements. The group also noted the importance of educational measures as well as the need to enforce existing road traffic legislation.

8. REQUEST THAT THE GR BE ALLOWED TO BEGIN WORK ON A DRAFT REGULATION BASED ON THE PROPOSAL AND THE REVIEW

According to the assigned Terms of Reference, the Pedestrian Safety gtr informal group should make a final proposal to GRSP before spring 2005. To do so, the group should prepare its draft proposal to GRSP before autumn 2004.

Based on this schedule, the time to prepare the draft proposal is limited. That is only one year after submission of our final preliminary report to GRSP.

If the group waits to start drafting the gtr until final approval of WP29 is received, the time for study will be much shorter than one year. In such a short period, a proposal can not be finalized.

For these reasons, the Informal Group asks GRSP's confirmation to start the study to establish the Pedestrian Safety gtr proposal immediately after the submission of the Step 1 report.

Of course, advices, suggestions and comments from GRSP and/or WP.29 have been received, study results will be modified based on such suggestions, comments and advices from GRSP/ WP29.

Then in line with the proposed time schedule, the Informal Group will prepare a draft gtr for Pedestrian Safety.

LEGEND

Documents used by this group are available on the UNECE website:

Number	Title
INF GR/PS/1	Agenda 1 st 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 1 st meeting
INF GR/PS/8	Draft Meeting Minutes 1 st meeting
INF GR/PS/9	Report to GRSP 32 inf doc
INF GR/PS/10	Draft action plan
INF GR/PS/11	Agenda 2 nd 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 2 nd meeting
INF GR/PS/19	Agenda 3 rd 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 3 rd meeting
INF GR/PS/25	GIDAS presentation
INF GR/PS/26	Leg injuries ITARDA
INF GR/PS/27	Draft Meeting Minutes 3 rd 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	NISHIMOTO, Toshiyuki : Introduction of the regulation of pedestrian head protection in Japan
INF GR/PS/34	Commission of the European Communities: 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, 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 4 th 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
