

**GRSG – Ad-hoc working group  
Safety of Wheelchair Passengers in Road Vehicles  
Monday 30 June 2003 & Tuesday 1 July 2003**

**Minutes**

Attending

Donald Macdonald (DM)(Chair)	Mobility & Inclusion Unit, DfT
Alan Lynch (AL)	Wheeled Mobility & Seating Centre MHRA
Adrian Eaton (AE)*	VSE, DfT
Marianne LeClaire (ML)	TRL Ltd
Charles Oakley (CO)*	TRL Ltd
Jan Petzall (JP)	Swedish National Road Administration
Antonio Rodriguez (AR)	INSIA
Michael Becker (MB)	Evobus GmbH
Harry Jongenelen (HJ)	RDW
Allan McKenzie (AM)	SMMT
Len Stanway (LS)	Ford Motor Company
Asbjorn Hagerupsen (AH)	Norway Public Roads Administration
Steven Salmon (SS)*	Confederation of Passenger Transport
Jim Hand (JH)	Mobility & Inclusion Unit, DfT

\* Present for day 1 only.

Apologies

Ann Frye	Head of Mobility & Inclusion Unit, DfT
Christian Pichon	UTAC, France
Giulio Mendogni	Iveco, Italy
Jurek Kownacki	ITS, Poland

## **1. Welcome and Introductions**

The Chairman opened the meeting and welcomed the delegates. This was followed by brief introductions from each of the group members.

## **2. Terms of Reference**

The draft Terms of Reference were discussed and the following amendments and/or clarifications were agreed:

- 2.1** Consider M2 and M3 category vehicles only.
- 2.2** Focus on the safety of passengers – drive from wheelchair solutions are hi-tech and bespoke and outside of the scope of this group.
- 2.3** Boarding and alighting shall be within the scope.
- 2.4** Consider the risk of injury for other passengers from a wheelchair.
- 2.5** Consider frontal impact, with the wheelchair in the forward and rearward facing orientations.
- 2.6** Consider the control of wheelchair movement during normal transit conditions for unsecured wheelchairs only.
- 2.7** The results would be presented as a draft proposal for an amended version of Annex 7 to UNECE Reg 107 which would be presented to GRSG for consideration.

## **3. Presentation of UK Department for Transport's research by TRL - UK**

TRL presented their research on safety of wheelchair passengers in road vehicles. The link to the report on the research is [http://www.dft.gov.uk/stellent/groups/dft\\_mobility/documents/page/dft\\_mobility\\_022736.hcsp](http://www.dft.gov.uk/stellent/groups/dft_mobility/documents/page/dft_mobility_022736.hcsp)

## **4. Presentation by the Medicines and Healthcare products Regulatory Agency (MHRA) - UK**

The MHRA, an agency of the Department of Health, presented on their role within the UK and the development of international standards for wheelchairs and wheelchair tie-down and occupant restraint systems (WTORS). A copy of the presentation is attached.

## **5. Presentation by University Research Institute for Automotive Safety (INSIA) – Spain**

INSIA presented on research that they had undertaken to investigate the safety of wheelchair users whilst travelling in a vehicle. They studied frontal, rear and side impact conditions. Their results showed particularly poor levels of protection for the

wheelchair user in rear and side impact configurations. Specific concerns were expressed regarding submarining and neck loading.

The MHRA commented that the wheelchair models used in the research did not appear to be modern designs. Over the past 5 years, most wheelchair manufacturers had made modifications to their products to address the results of vehicle impact submarining and that new wheelchairs now have much better anti-submarining performance providing the WTORS are used correctly.

## **6. Presentation by Swedish National Road Administration**

The expert from Sweden presented on their research. They have carried out dynamic testing in both the forward and rearward facing orientations. Their results indicated submarining to be a major problem. They found that improvements could be made by utilising a well fitted head and back restraint that was independent of the wheelchair. They also demonstrated that shortening the occupant restraint straps could make further improvement.

They reported that a survey of wheelchair users carried out in Sweden showed that 5% of those that used public transport services had reported receiving an injury whilst doing so. This was further broken down as follows:

Car crash	9%
Braking and accelerating	61%
Transport to and from	6%
Boarding and alighting	21%
Other	4%

MHRA commented that these findings were broadly in line with the MHRA incident records.

## **7. Discussion**

- 7.1** In developing solutions to improve vehicle safety for wheelchair users, it is important to bear in mind a wheelchair's primary task, that is, to provide individuals with local mobility. It is imperative that any recommendations should have a minimal effect upon a wheelchair's size and weight thereby rendering it less effective in its primary role.
- 7.2** MHRA advised caution in specifying large areas of 'free space' as there had been reports in which wheelchair users had received fatal injuries in vehicles where there had been nothing to impede excessive movement. It was acknowledged that large areas of 'free space' often result in a secondary effect of providing easy access for a wheelchair.
- 7.3** Analysis of accident statistics would be beneficial in establishing how to achieve the greatest safety benefits. However, comprehensive and accurate data for accidents involving wheelchair users was scarce. The expert from Norway advised that the data that they have collected identified mis-use of equipment as the main cause of injury to wheelchair users.

- 7.4 Where possible, technical requirements resulting from this work should be performance based and not prescriptive.
- 7.5 The MHRA advised that in the UK, there are approximately one Million-wheelchair users, and approximately 40,000 manual wheelchairs sold per annum. In the UK, the MHRA records incidents that are reported to them involving wheelchairs. Analysis of this data for the period Jan 1999 to Jan 2003, showed that there were 35 fatalities, 12 of these were users of vehicles. Of these, 7 were attributable to incomplete or incorrect WTORS and 5 were vehicle mounted access lift accidents. They could also confirm that all of the transport related incidents occurred in minibuses or taxis –none were recorded on larger buses.
- 7.6 Most of the work so far considers the adult situation. The expert from Sweden reported that they have carried out some work to examine the safety of children in wheelchairs. They have a project, the objective of which is to develop a seat for children, which is intended to meet UNECE Reg 44. The project is due to report in 6-12 months. Work on ISO wheelchair and seating (ISO 10542-5, 16840-4 etc) standards does include children and future work is planned to include them in others.
- 7.7 It was agreed that it was important to consider the safety of children but that the group should not let the lack of data in this area hold up developing requirements for adults.
- 7.8 Proposed amendments should, wherever possible, call up the technical requirements of existing standards.
- 7.9 It was proposed, and agreed, that 1 month prior to the next meeting, each of the experts would prepare a list of items for inclusion in an amended Annex 7 of UNECE Reg 107, together with their concerns and suggestions as to how Annex 7 could be re-structured.

## 8. **Date of next meeting**

The expert from Sweden offered to host the next meeting on 15/16 December 2003.