IWG Safer Transport of Children in Buses and Coaches

Fifth meeting
28/01/2021
OICA
CRS installation in buses & coaches

- Influence on interior arrangements of buses & coaches:
  1) Seat dimensions and spacing
  2) Access to the vehicle seats
  3) Relevant vehicle classes
  4) 2-pts belt / 3-pts belt restraint availability
  5) In-vehicle child seats (eg: Sit Safe)
  6) Support leg assessment volume

- France, Germany, Spain and UK accident data
Influence on interior arrangements of buses
1) Seat dimensions and spacing

Using UN R 129-CRS would lead to larger seat spacing and a significant loss of seats in the vehicles

<table>
<thead>
<tr>
<th>Classes</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>I, A and B</td>
<td>650 mm</td>
</tr>
<tr>
<td>II and III</td>
<td>680 mm</td>
</tr>
</tbody>
</table>

Seat spacing
UN-R107 Annex 3 §7.7.8.4

Front-facing ISO/F3 CLASS A: 1722 mm
Rear-facing ISO/R2 CLASS D: 915 mm
Influence on interior arrangements of buses

1) Seat dimensions and spacing

Permitted intrusions acc. to UN R 107 are in conflict with the dimensions of UN R 129-CRS!

Permitted intrusion above a seating position
UN-R107 Annex 3 §7.7.8.6.3.2

I (mm)
400 to 500 (for Classes A, B, I and II min 350 mm at wheel arches and engine compartment(s))
Influence on interior arrangements of buses
2) Access to the vehicle seats

UN R 107 Gangway dimensions do not permit to move the CRS to the individual passenger seats!

<table>
<thead>
<tr>
<th>Class</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>550</td>
<td>450</td>
<td>500</td>
<td>1900</td>
<td>900</td>
</tr>
<tr>
<td>A and II</td>
<td>550</td>
<td>350</td>
<td>500</td>
<td>1900</td>
<td>900</td>
</tr>
<tr>
<td>B</td>
<td>450</td>
<td>300</td>
<td>300</td>
<td>1500</td>
<td>900</td>
</tr>
<tr>
<td>III</td>
<td>450</td>
<td>300</td>
<td>500</td>
<td>1900</td>
<td>900</td>
</tr>
</tbody>
</table>

Gangway mannequin (Class B)
UN-R107 Annex 3 §7.7.8.6.3.2

Influence on interior arrangements of buses
2) Access to the vehicle seats

UN R 107 Gangway dimensions do not permit to move the CRS to the individual passenger seats!
### Influence on interior arrangements of buses

3) Relevant vehicle classes

**Seat belt fitting in Class II – vehicles follows national regulations of CPs – harmonisation needed?**

<table>
<thead>
<tr>
<th>Number of passengers</th>
<th>Accomodation of passengers</th>
<th>Class</th>
<th>GVM ≤ 5t (M2)</th>
<th>GVM &gt; 5t (M3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 - 22</td>
<td>Standing +seated</td>
<td>A</td>
<td>No *</td>
<td>No *</td>
</tr>
<tr>
<td></td>
<td>All seated</td>
<td>B</td>
<td>3-pt belt **</td>
<td>2-pt belt **</td>
</tr>
<tr>
<td>&gt; 22</td>
<td>Standing &amp; seated (urban)</td>
<td>I</td>
<td>No *</td>
<td>No *</td>
</tr>
<tr>
<td></td>
<td>Mostly seated (interurban)</td>
<td>II</td>
<td>No ***</td>
<td>No ***</td>
</tr>
<tr>
<td></td>
<td>All seated (coach)</td>
<td>III</td>
<td>3-pt belt</td>
<td>2-pt belt **</td>
</tr>
</tbody>
</table>

* When fitted, safety-belts must be in compliance with this regulation

** 8.1.7 – 3-pt belt must be installed unless:
1) Reference zone empty or
2) UN-R80 seat or
3) Parts fulfilling UN-R80 energy absorption test.

***Contracting Parties applying this Regulation may demand the installation of safety belts on M2 and M3 vehicles belonging to Class II.
Most vehicles on the market are fitted with 2P-belts with energy absorbing zones!

### Influence on interior arrangements of buses

#### 4) 2-pts belt / 3-pts belt availability

<table>
<thead>
<tr>
<th>Number of passengers</th>
<th>Accommodation of passengers</th>
<th>Class</th>
<th>UN-R16 Minmmum requirements for safety belts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>GVM ≤ 5t (M2)</td>
</tr>
<tr>
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Influence on interior arrangements of buses

5) In-vehicle child seats

CRS-bus approval shall follow prescriptions on UN R 80 – basis, shall be technology neutral and not focused on existing R 129-CRS

Eg: SiTSafe as a solution for option in Nordic bus procurement requirements

« At least 2 child seats for 3 years of age (UN-R44) »
Influence on interior arrangements of buses
6) Support leg volume assessment

Support leg might lead to further increase of seat spacing and further loss of seats in the vehicle!
- Most of injured children are above 9 years old
- Most of them were not restrained.

In-depth data: CEESAR in-depth accident investigations

Age distribution of injured child victims (N=325 occupants, n=12 unknown):

The 13-15 year-old age group shows the highest number of victims.

In-depth data: GIDAS – German in depth accident study

- Majority of injuries were minor head injuries, mostly contusions or cuts to the face which were caused by contact with the front seat (by braking manoeuvres) or with grab poles inside the bus
- Not seated: High incidence of injuries to the arms from falling over (contusions, abrasion wounds)
SUMMARY

➢ We identified some issues with significant influence on vehicle and its interior and seating layout:
  ✓ CRS according to UN-R129 seem not to be compatible with Bus interior arrangements according to UN-R 107

➢ France, Germany, Spain and UK accident data:
  ✓ Main victim population: 9 years and older
  ✓ Cause: unrestrained

➢ We propose to seek guidance from GRSG
  ✓ How to deal with vehicle requirements (UN-R107)
  ✓ Number of designated CRS places in the vehicle needed?
  ✓ ToR of the IWG to be amended accordingly