

**Transport Department Notice
Vehicle Safety and Standards Division**

**Technical Bulletin No. 54/2004
Guide for Measuring of Passenger Seats and
Space for Seated Passengers on Public Light Bus**

1 Introduction

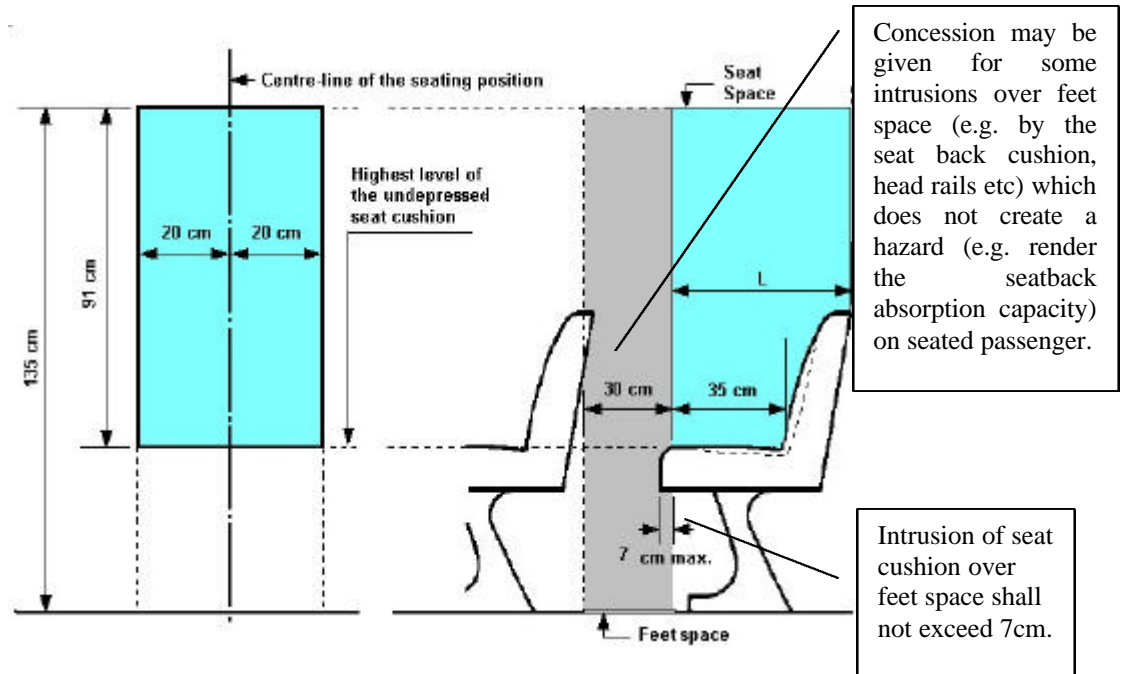
- 1.1 The Section 9 of Road Traffic Ordinance delegates Secretary for the Environment, Transport and Works to make regulations to the construction and maintenance of vehicles, and their equipment. Section 73 of Road Traffic (Construction and Maintenance of Vehicles) Regulations stipulates that the passenger seats requirements in light bus and Section 73(g) in particular requires that no seat shall be placed in such position as to cause discomfort to passenger but there is no further elaboration on the definition of “discomfort”.
- 1.2 With a view to enhance the comfort to passenger and allow vehicle manufacturer and registered vehicle owner to have a better understanding of the requirements, the Commissioner for Transport, with reference to international practices, has prepared a seat measuring standard to prescribe the criteria in construction of vehicles.
- 1.3 This seat measuring method (including most of the illustrations) is derived from ECE Regulation 52 (E/ECE/324/E/ECE/TRANS/505/Rev.1/Add.51/Rev.1/Amend.1): Uniform Provisions Concerning the Construction of Small Capacity Public Service Vehicles (ECE R52) plus provisions stipulated in Road Traffic (Construction and Maintenance of Vehicles) Regulations (C&M). **Please note that some of the allowances made under ECE R52 concerning installation of the seat and feet space have not been adopted, because the existing products available in Hong Kong are already able to overcome such limitations.**
- 1.4 This Bulletin serves as a guide for measuring passengers seat and space for seated passengers on public light bus registered on and after 1st August, 2004.

2. Requirements

2.1. Passenger Seats and Space for Seated Passengers

In the absence of further instructions in this Guide, each seating place shall have a

vertical clear space of not less than 91 cm from the highest point of the undepressed seat cushion and at least 135 cm from the floor where the feet of the seated passenger rest (see Figure 1).



- 2.1.1.1. *Seating space* – means the rectangular area of 40 cm in width, symmetrical in relation to the median vertical plane of the seat, and having a length "L" defined in Figure 2, which represents a section through the median vertical plane of the seat;
- 2.1.1.2. *Feet space* – means the area intended for the feet of the seated passenger, over the same width of 40 cm and a depth of 30 cm.
- 2.1.2. In the space extending above the feet space (paragraph 2.1.1.2.) the following intrusions shall be permitted:
 - 2.1.2.1. intrusions of the seat cushion of the seat concerned (see Figure 2), the seat back of the seat in front, its supports and its attachments (see Figure 11);

2.1.2.2. intrusion situated in the lower part of the feet space in question, adjacent to the sidewall of the vehicle, of a cross-sectional area not exceeding 200 cm² and having a maximum width of 10 cm (see Figure 3).

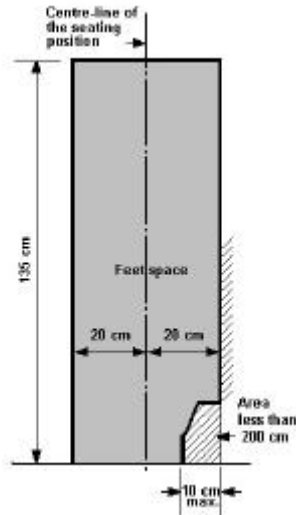


Figure 3 – Permitted Intrusion in the Lower Part of the Passenger Space (see paragraph 2.1.2.2.)

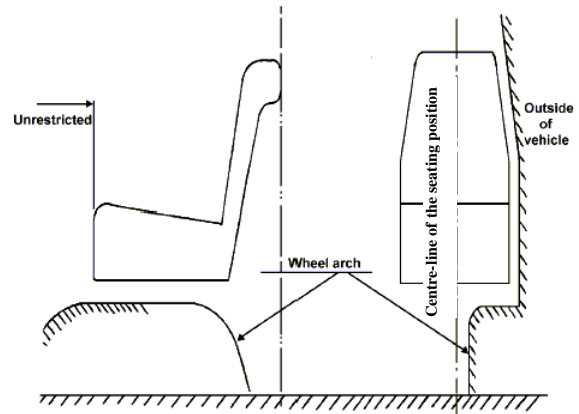


Figure 4 – Permitted Intrusion of a Wheel Arch not Extending Beyond the Vertical Centreline of the Side Seat (see paragraph 2.1.2.3.1.)

2.1.2.3. Intrusion of feet space by wheel arch provided that one of the following two conditions is fulfilled:

2.1.2.3.1. the intrusion does not extend beyond the vertical centerline of the seat (see Figure 4), or

2.1.2.3.2. the area 30 cm in depth available for the feet of the seated passenger is moved forward by not more than 20 cm from the edge of the seat cushion and not more than 60 cm in front of the back rest of the seat (see Figure 5 and Figure 11), these measurements being made in the median vertical plane of the seat.

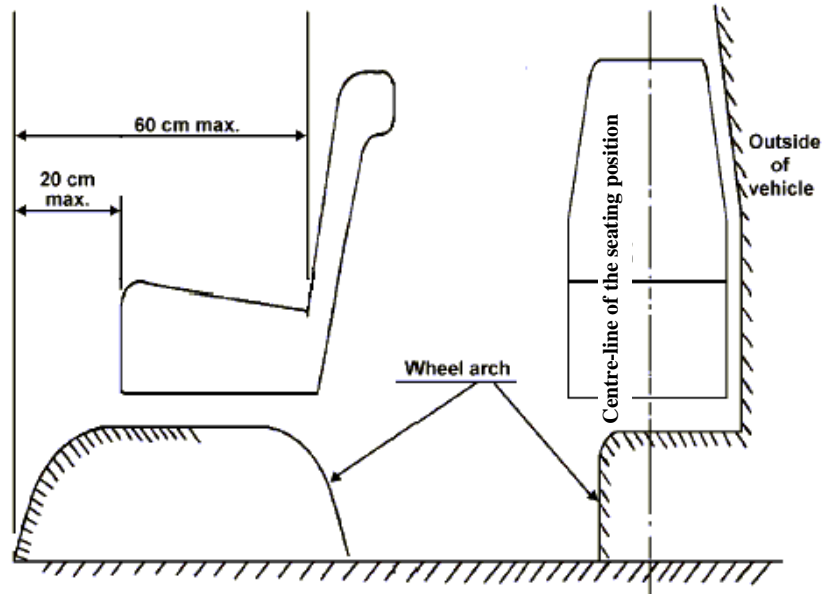


Figure 5 – Permitted Intrusion of a wheel Arch Beyond the Vertical Centerline of the Side Seat (see paragraph 2.1.2.3.2.)

2.1.3. In the case of the two rear side seating places, the rear edge adjacent to the side wall of the vehicle of the space situated above the area mentioned in paragraph 2.1.1.1. may be replaced by a cylindrical segment 15 cm in radius (see Figure 6).

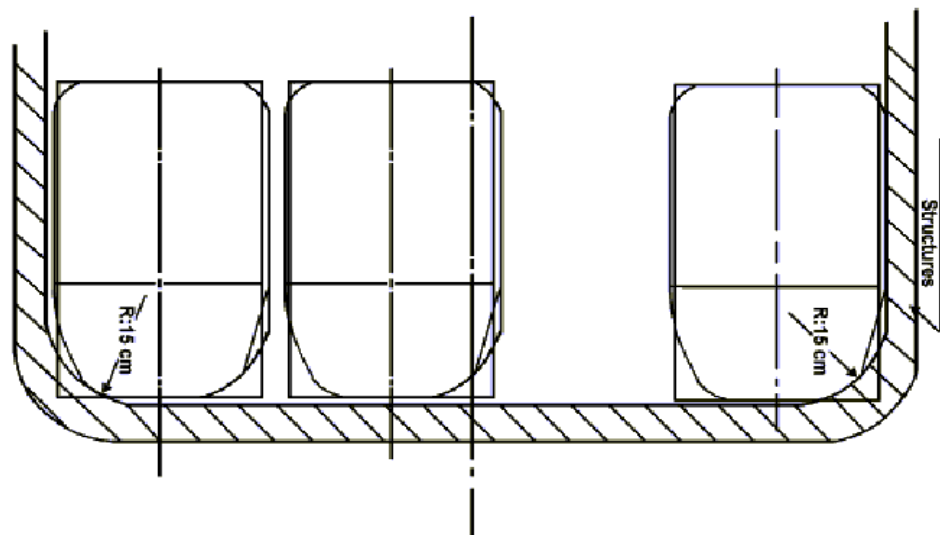


Figure 6 – Permitted intrusion at the Rear Corner Seat: View of the Prescribed Area of the Seat – (2 Side Seat at the Rear) (see paragraph 2.1.3.)

2.2. Seat dimensions (see Figures 7 and 8)

2.2.1. The minimum dimensions for each seating place(see Figure 7), as

measured from a vertical plane passing through the center of that seating place, shall be as follows:

Type	Descriptions	Width* (cm)
Individual seats	Minimum width of the seat cushion on each side (F)	20 (recommended)
	Minimum width of the available space (G), measured in a horizontal plane along the seat back at heights between 27 and 65 cm above the undeepressed seat cushion	22.5
Continuous seats for two or more passengers	Minimum width of the seat cushion (F) per passenger, on each side	20 (recommended)
	Minimum width of the available space (G), measured in a horizontal plane along the seat-back at heights between 27 and 65 cm above the undeepressed seat cushion	22.5

*The width of foldable armrest shall be disregarded in measuring the width.

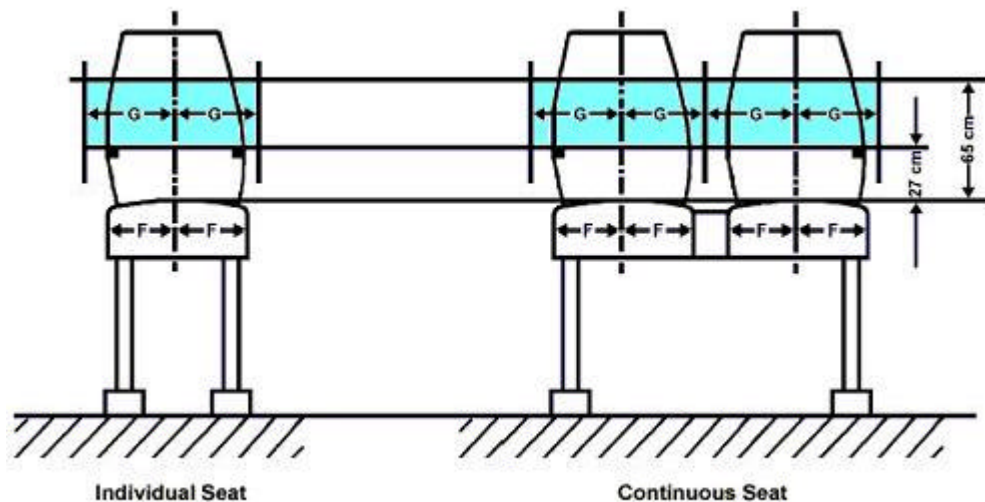


Figure 7 – Dimensions of Passenger Seats (see paragraph 2.2.1.)

2.2.2. **Shoulder intrusion** - In the case of seats adjacent to the wall of the vehicle, the available space does not include, in its upper part, a triangular area 2 cm wide by 10 cm high (see Figure 8).

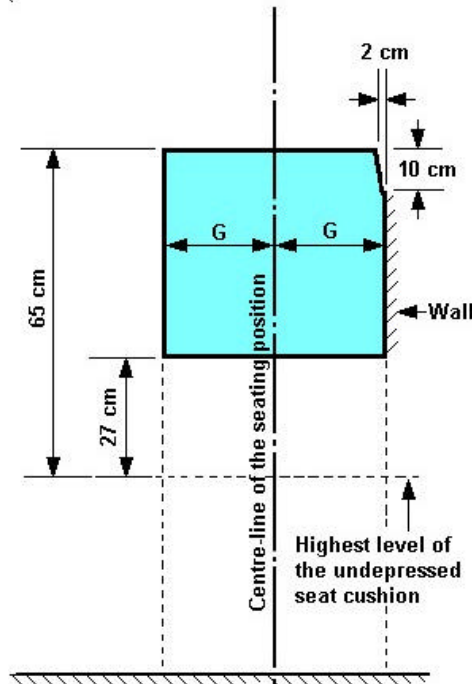


Figure 8 – Permitted Intrusion at Shoulder Height (Transversal Section of the Minimum Available Space at Shoulder Height for A Seat adjacent to Wall of the Vehicle) (see paragraph 2.2.2.)

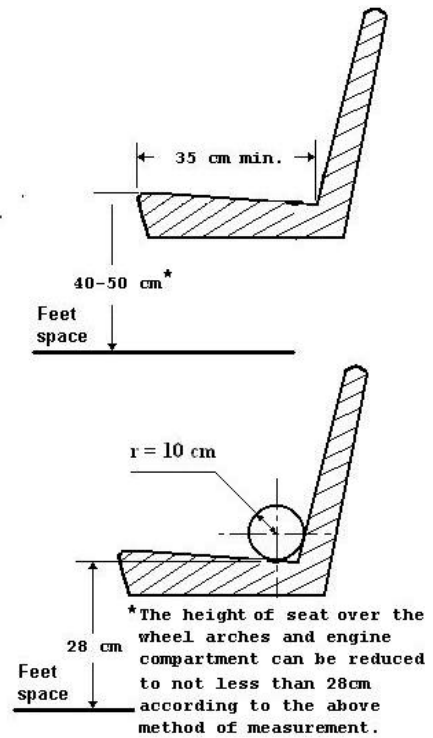


Figure 9 - Seat-cushion Depth (see paragraph 2. 3.)

2.3. Seat cushions (see Figure 9)

2.3.1. The height of the undepressed seat cushion relative to the floor under the passenger's feet shall be such that the distance from the floor to a horizontal plane tangent to the front upper surface of the seat cushion is between 40 and 50 cm. However, it may be reduced to not less than 28 cm over the wheel arches or engine compartment area.

2.3.2. The minimum depth of the seat cushion shall be at least 35 cm.

2.4. Seat spacing (see Figure 10)

2.4.1. In the case of seats facing in the same direction, there is a clear space of at least 65 cm in front of the back rest of any seat measured horizontally and at all heights above the floor between the level of the top surface of the seat cushion and a point 62 cm above the floor allowed for the accommodation of a seated passenger and a clear space of at least 23 cm

in front of any part of that seat, in the case of a seat for more than 3 passengers where access to that seat can be obtained only from one end of the seat, the clear spaces shall respectively be at least 68 cm and 30 cm.

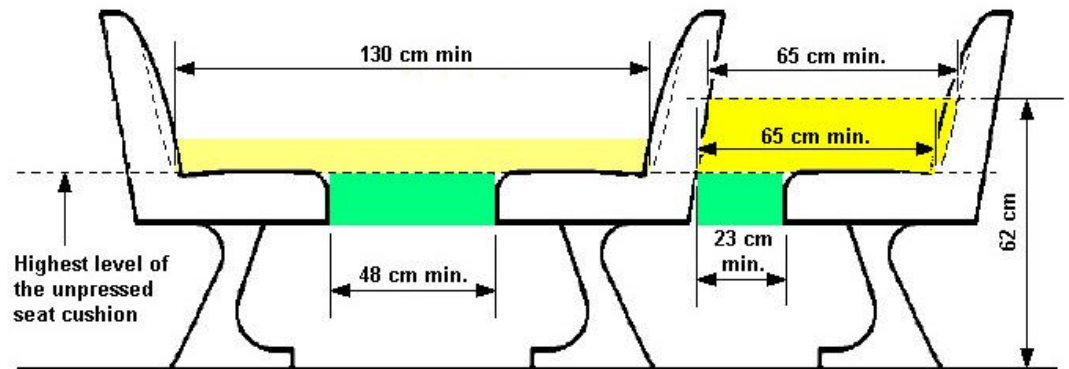


Figure 10 - Seat Spacing (see paragraph 2.4.)

- 2.4.2. All measurements shall be taken, with the seat cushion and back rest undepressed in a vertical plane passing through the centreline of the individual seating place.
- 2.4.3. Where transverse seats face one another the minimum distance between the front faces of the seat back rests of facing seats, as measured across the highest points of the seat cushions, shall be not less than 130 cmⁱ. There shall be a clear space of at least 48 cm between any part of the front edge of any transverse seat and any part of any other seat which faces it.

2.5. Space for seated passengers

A minimum clear space in front of each passenger seat shall be provided as shown in Figure 11.

- 2.5.1. The seat back of another preceding seat or a partition whose contour corresponds approximately to that of the inclined seat back may intrude into this space as provided by paragraph 2.4.. The local presence in this space of seat legs shall also be permitted provided that adequate space remains for the passenger's feet (see Figure 11).
- 2.5.2. In case of seat alongside the driver's seat (see Figure 11), intrusion of the dashboard, instrument panel, windscreen, sun visor, seat belts and seat belt

ⁱ This is a transverse seat. For seat placed lengthwise, 138 cm as stipulated in 73(1)(d) should be followed.

anchorages shall be allowed subject to a clear space of at least 28 cmⁱⁱ in front of any part of that seat is provided. Intrusion of hopper type windows when open and their fittings shall be allowed.

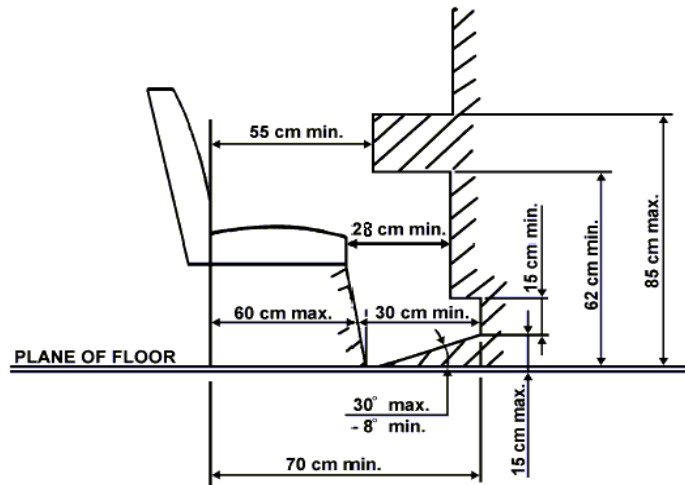


Figure 11 - Space for seated passengers (see paragraph 2.1.2.1., 2.1.2.3.2., 2.5.1. & 2.5.2.)

2.6. Measuring the height of the back rest

2.6.1. Two reference lines, 'AB' and 'CD' are drawn along the surface of the undepressed seat cushion and back rest at the median vertical plane. A line 'EF' parallel to 'AB' is drawn tangential to the upper edge of the seat back. 'H' is the height of the seat back (see Figure 12).

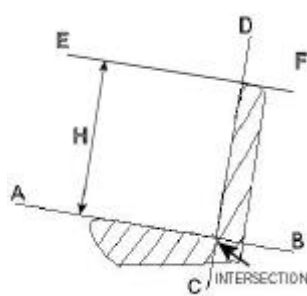


Figure 12 – Determination of the height of back rest (see paragraph 2.6.1.)

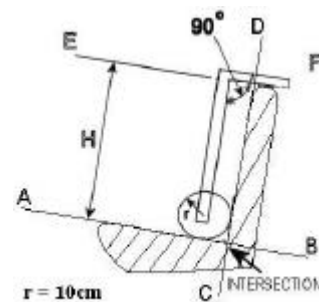


Figure 12a – Determination of the height of back rest (see paragraph 2.6.2.)

ⁱⁱ The ECE R52 allows intrusion of instrument panel over feet space but its minimum legroom requirement is 28cm which is different from the 23cm requirement as stipulated in C&M. Hence, the discretion on exercising the allowance under this Instruction should be based on whether sufficient legroom is provided on the vehicle concerned.

2.6.2. As an alternative, a special tools, 20 cm diameter circular disc, is placed in such a way that the circular disc touches both the seat cushion and seatback (see Figure 12a). Measure the straight line distance in a direction parallel to the seatback surface from the point of contact of the circular disc with the seat cushion (in case where there are more than two points of contact, the nearest point of contact to the bottom surface of the device proper should be considered) to the upper edge of the seatback.

2.7. Provision of padding of impact energy absorption material in front of lap belt wearer (see Figure 13)

Any part of the surface or edge of any guard, or the top or edge of any screen or partition, which would be likely to be struck by the head of a passenger wearing the lap belt in the event of an accident, shall be padded with impact energy absorption material or padding of depth not less than 5cm. Nothing in above shall require padding to be provided on any surface more than 100cm from the centre of the line of intersection of the seat cushion and the back rest or more than 15 cm on either side of the longitudinal vertical plane which passes through the centre of that line. When the circular disc mentioned in paragraph 2.6.2 is used to measure the distance specified in this paragraph, the distance between the centre of the circular disc and the centre of the line of intersection shall be defined as 14 cm.

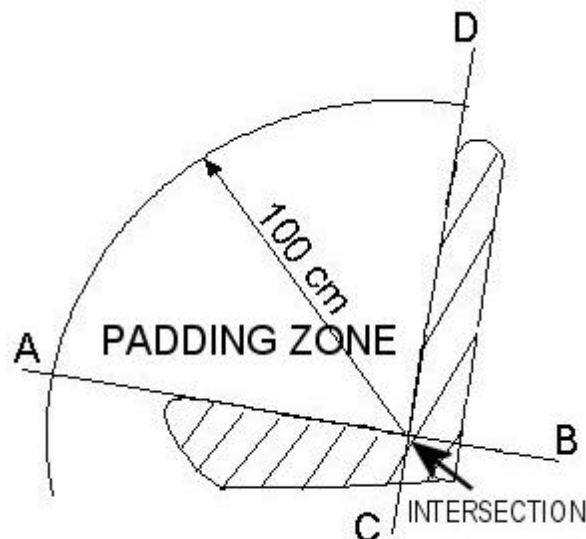


Figure 13 – Provision of padding On going impact energy absorption material (see paragraph 2.7.)

2.8. Priority seat for passenger with reduced mobility

It is recommended that, at least two forward or rearward facing seats specifically intended and marked for passengers with reduced mobility shall be provided in that part of the vehicle which is most suitable for boarding. These seats shall be designed for passengers with reduced mobility; sufficient space with suitably designed and placed handholds to facilitate entry and exit of the seat shall be provided. In general, it is recommended that these seats shall provide at least 110% of the space in paragraph 2.5. Appropriate pictograms (see example in Figure 14) shall also be placed adjacent to the priority seat.



*Figure 14 – Pictogram for Passengers with Reduced Mobility
(source : Directive 2001/85/EC) (see paragraph 2.8.)*

- END -

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