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Application of the Accessibility NTSN

This document contains guidance on the application of the Accessibility (ACC) NTSN, particularly when undertaking work that would not necessarily constitute an upgrade, but where there is a reasonable opportunity to move towards partial compliance with the requirements of the NTSN.

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Synopsis

This document contains guidance on the application of the Accessibility (ACC) NTSN, particularly when undertaking work that would not necessarily constitute an upgrade, but where there is a reasonable opportunity to move towards partial compliance with the requirements of the NTSN.

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Issue record

Issue	Date	Comments
One	June 2021	Original document
Two	December 2025 [proposed]	Revised to support updated NTSN published May 2025 including name change from PRM NTSN to ACC NTSN.

Revisions have not been marked by a vertical black line in this issue because the document has been revised throughout.

Superseded documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GEGN8615 Issue One, Application of the PRM NTSN	All	6 December 2025 [proposed]

Supply

The authoritative version of this document is available at www.rssb.co.uk/standards-catalogue. Enquiries on this document can be submitted through the RSSB Customer Self-Service Portal https://customer-portal.rssb.co.uk/

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Part 1 Purpose and introduction

G1.1 Purpose

G1.1.1 This document gives guidance on the application of the Accessibility (ACC) National Technical Specification Notice (NTSN), particularly when undertaking work that would not necessarily constitute an upgrade, but where there is a reasonable opportunity to move towards partial compliance with the requirements of the NTSN. The ACC NTSN is an update of the earlier Persons with Reduced Mobility (PRM) NTSN.

G1.1.2 This document is to be read in conjunction with the Department for Transport's (DfT) Code of Practice 'Design Standards for Accessible Railway Stations' ('the DfT Code of Practice') and the Railways (Interoperability) Regulations 2011 (RIR 2011); these may contain requirements additional to the ACC NTSN which may affect the applicability of sections in the NTSN, such as Appendix F.

G1.1.3 The ACC NTSN requirements are specified to improve accessibility but may not be sufficient to reduce safety risks to the level required by law, or to satisfy other legal requirements such as the Equality Act 2010. Further guidance is given in the 'Accessible Travel Policy Guidance' published by the Office of Rail and Road (ORR).

G1.1.4 National Technical Specification Notices are published by the Secretary of State pursuant to regulation 3B of RIR. These NTSNs replace and substantially reproduce the provisions of Technical Specifications for Interoperability (TSIs) except where there are GB specific alternatives which are identified as Specific Cases in the relevant NTSNs.

G1.1.5 GEGN8601 provides guidance on topics common to several NTSNs and these are not repeated here.

G1.1.6 This document does not set out requirements.

G1.2 Background

G1.2.1 The ACC NTSN is intended for application to 'public areas' and 'rolling stock intended to carry passengers' as defined therein.

G1.2.2 The ACC NTSN sets out the following subsystem requirements:

a) Section 4.2.1: infrastructure subsystem.
b) Section 4.2.2: rolling stock subsystem.
c) Section 5.3: list and characteristics of interoperability constituents.

Guidance on interoperability constituents (ICs) and the IC NTSN is available on the RSSB website.

G1.2.3 Some of the EN and ISO standards referenced in the NTSN may have been superseded. Where the standard is explicitly called up in the NTSN then the referenced version is used; where the standard is provided for information then the latest version can be used.

G1.2.4 The scope of the ACC NTSN includes persons with disabilities and persons with reduced mobility. It therefore includes, among others:

a) Those with physical problems who have difficulty moving about;
b) Those with sensory problems who have difficulty seeing or hearing; and
c) Those with learning disabilities or mental health issues for whom public transport can be stressful and confusing.

G1.2.5 Disability affects many people:

a) Disability is not always visible but may still have a significant effect on a person's ability to travel;
b) One in four families includes someone with a disability;
c) Around two thirds of disabled people are over retirement age; the number of disabled people is likely to increase with expected changes in the population age distribution.

G1.2.6 Reduced mobility can be a temporary state. For example, pregnancy, illness or a broken limb are likely to affect a person's mobility; see the definition in BS 9992:2020.

G1.2.7 Reduced mobility can also be due, for example, to carrying luggage or having a pushchair.

G1.3 User's responsibilities

G1.3.1 Industry experts representing railway industry stakeholders are involved in the process for setting the content of documents that are prepared in accordance with the procedures set out in the Railway Standards Code and Manual.

G1.3.2 Users of documents published by RSSB are expected to be competent or should take specialist advice before following or applying any practices or principles contained within them and are reminded of the need to consider their own responsibilities to ensure safe systems of work and operation, health and safety at work and compliance with their own duties under health and safety legislation. While documents published by RSSB can be used to help inform and devise safe practices and systems of work, their content has not been designed or prepared for:

a) Reliance by any specific person or organisation; and
b) Application or use in all possible operational or working environments.

G1.3.3 No representation, warranty, guarantee, confirmation or other assurance is given or made (whether expressly or implicitly) that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.

G1.3.4 Users and duty holders remain responsible at all times for assessing the suitability, adequacy and extent of any measures they choose to implement or adopt and RSSB does not accept, and expressly disclaims, all and any liability and responsibility except for any liability which cannot legally be limited.

G1.4 Structure of this document

G1.4.1 Relevant requirements from the ACC NTSN are reproduced with a grey background in this document.

G1.4.2 The European Union Agency for Railways Application Guide GUI/PRM TSI/2023 (the ERA Application Guide) is considered useful reference; relevant text from this document is reproduced in tables with a white background.

G1.4.3 Guidance is provided as a series of sequentially numbered clauses.

G1.4.4 Sufficient NTSN text is reproduced to put the guidance in context, but not all the NTSN text is included.

G1.4.5 In cases where the NTSN requirements are not specific to the railway environment (for example toilets and lifts in stations) then the point is not included and no guidance is given.

G1.4.6 Where requirements are covered by Specific Cases for the GB Mainline Network (described in chapter 7 of the ACC NTSN), these are grouped with the relevant main text. Text applicable to Interoperability Constituents (chapter 5 of the ACC NTSN) is also grouped with the technical requirements of chapter 4 followed by relevant guidance.

G1.4.7 Specific responsibilities and compliance requirements are set out in the ACC NTSN.

G1.5 Approval and authorisation of this document

G1.5.1 The content of this document will be approved by Infrastructure Standards Committee on 16 September 2025 [proposed].

G1.5.2 This document will be authorised by RSSB on 31 October 2025 [proposed].

Part 2 Guidance on infrastructure design

G2.1 Scope and introduction

G2.1.1 Infrastructure - general

ACC NTSN 2.1.1 Scope related to infrastructure subsystem

This NTSN applies to all the public areas of stations dedicated to the transport of passengers that are controlled by the railway undertaking, infrastructure manager or station manager. This includes the provision of information, the purchase of a ticket and its validation if needed, and the possibility to wait for the train.

G2.1.1.1 Chapter 3.1 (Scope of subsystems and definitions) of the ERA Application Guide states:

That definition of the scope related to infrastructure clarifies that only those parts of the stations dedicated to transport are concerned (and not shopping malls for instance). Also, it clarifies that the TSI applies only to stations and not to (for instance) emergency exits, safe areas in tunnels or level crossings that are not part of the obstacle free route of a station.

Areas that are not controlled by the railway undertaking, infrastructure manager or station manager (either directly or through sub-contractors) are out of scope; this can be the case, for instance, of car parks.

ACC NTSN 4.2.1 Infrastructure subsystem

(2) The basic parameters that are specified in points 4.2.1.1 - 4.2.1.15 apply to the scope of the infrastructure subsystem that is defined in point 2.1.1; they can be divided into two categories:
- Those for which technical details need to be specified, such as the parameters relative to the platforms and how to reach the platforms. In this first case, the basic parameters are specifically described and the technical details to be satisfied in order to fulfil the requirement are detailed.
- Those for which technical details are not necessary to be specified, such as the value of ramps or the characteristics of parking places. In this second case, the basic parameter is defined as a functional requirement that can be met by applying several technical solutions.

The table 3 below indicates the category of each of the basic parameters.
[Table 3 not reproduced]

G2.1.1.2 Table 3 is not repeated here but, in the body of this document, where guidance is given, reference is made to whether a requirement is of the first category (Technical details provided) or the second category (Functional requirements only).

G2.1.1.3 For second category requirements (Functional requirements only), any ENs listed in the NTSN are deemed to provide compliance but the EN is not mandatory. Chapter 2.1 of the ERA Application Guide states:

> Regarding the second category of basic parameters, the Working Party drafting the PRM TSI ensured that they can always be covered by an international (ISO) or European (EN) standard, with a few exceptions.
>
> Therefore, for those parameters, the TSI is deliberately specifying a high level functional requirement: the present application guide lists some international and European standards that the applicant may apply in order to meet this functional requirement.
>
> The application of these standards remains voluntary, and the applicant can always apply other standards to meet the requirements. As a matter of fact, the functional requirements are also generally covered by national, regional or local standards and sometimes even by company rules.
>
> The principles for the application of other standards than the ones that are listed in this Application Guide are the following:
>
> National/regional/local standards can be applied when they provide an equivalent solution than the one specified in the standards listed in this guide.
>
> National/regional/local standards can only be applied on the territory they cover: one of the reasons for removing some detailed requirements from the TSI is to allow some harmonization at local level. An applicant that would intend to use a "foreign" standard would strictly be in contradiction with this objective.
>
> Company rules can be used when they are derived from the above standards or when they have been validated by a representative group of users.
>
> Equivalence is to be understood as "having the same or a similar effect" as per the definition of Collins dictionary:
>
> *Equivalent, adjective*
> *1. equal or interchangeable in value, quantity, significance, etc.*
> *2. having the same or similar effect or meaning.*

> In the following points, those requirements are called “parameters of the 2nd category”.
>
> Guidance for the assessment of the parameters of the 2nd category is given in chapter 4.1.

G2.1.1.4 Chapter 4.1 (Assessment of parameters of the second category) of the ERA Application Guide states:

> The international and European standards represent the state-of-the-art or the benchmark for accessibility. Therefore conformance to these standards is the easiest, clearest and in many cases the cheapest approach.
>
> Where an applicant has chosen not to apply such standard then this approach is acceptable. However, this may involve additional efforts to justify that equivalence in terms of accessibility has been reached.
>
> The application of a pre-existing National, Regional or local rule or standard, or validated company rule, when such rule has been commonly applied in other public areas, is acceptable. In such case, the equivalence only consists in a demonstration that the rule or standard is already commonly applied in railway/station infrastructure or other public areas or that it is mandatory by legislation.

G2.1.1.5 Railway Group Standards or Rail Industry Standards, where applied appropriately, would be expected to meet this equivalence criterion.

G2.1.1.6 Further information on demonstrating equivalence is given in the ERA Application Guide.

G2.1.2 Application of this NTSN to new infrastructure

ACC NTSN 7.1.1	New Infrastructure
	This NTSN is applicable to all new stations in its scope.
	It is not mandatory to apply this NTSN to new stations which have already been granted a building permit or which are subject to a contract for major construction works that was either already signed or under final phase of tendering procedure at the date of application of this NTSN. However, an earlier version of this NTSN, or PRM TSI if this was before 2021, must be applied within its defined scope. The consistency of applicable requirements of partial application of different versions of this NTSN or TSI to particular sections of the station must be justified by the applicant certified by the approval body.
	Where stations which were closed for a long time to passenger service are put in service again, this may be treated as renewal or upgrade in accordance with point 7.2.

> In all cases of construction of a new station, the project entity shall organise consultation with the local planning authority, in order to enable as far as possible the accessibility requirements to be met not only in the station, but also for access to the station. In the case of multimodal stations, other transport authorities shall be consulted for access to and from the railway and to and from other modes of transport.

G2.1.2.1 Attention is drawn to clause 3.7.1 of the ERA Application Guide for 7.1.1 of the PRM TSI:

> The revised TSI can be used for station projects that should normally be assessed according to the PRM TSI 2008; in such a case it does not necessarily need to be applied in its entirety. There may be reasons not to apply the revised TSI entirely: for example, civil works may be advanced, with 800mm entrance doors already in place making difficult the use of the revised TSI that requires 90cm. This should not prevent an applicant from using the new TSI for the marking of those doors, for instance.
>
> In such case, it is necessary to ensure that the mix of TSIs remains consistent and does not result in contradictions or to the disappearance of some parameters. The applicant shall justify that, and a notified body has to approve it.

These extracts are relevant in determining whether a project is a new station or not.

G2.1.2.2 The intent of this clause is to clarify that for stations at an advanced stage of development the version of the TSI or NTSN that applied at the time when contracts were signed may continue to be used. The text refers to '*an earlier version*' rather than a specific version, as this depends on the date that contracts were signed. For stations which were at an advanced stage before the NTSN was first published on 1 January 2021, a reference to the PRM TSI is also needed.

G2.1.2.3 The GB station operator licence also requires compliance with the DfT Code of Practice which widens the application of the NTSN.

G2.1.2.4 For any new station project it is good practice to consult and involve disabled people's representatives and relevant local organisations.

G2.1.3 Application of this NTSN to existing infrastructure

ACC NTSN 7.2.2	Application of this NTSN to existing Infrastructure For infrastructure, the conformity with this NTSN is mandatory for those parts that are renewed or upgraded. However, the NTSN recognizes that, due to the characteristics of the inherited railway system, compliance of existing infrastructure may be achieved through a gradual improvement of accessibility. In addition to this gradual approach, compliance with this NTSN permits the following exceptions: - In case an obstacle free route is created from existing footbridges, stairways and subways, including doors, lifts and ticket control machines, compliance with requirements related to dimensions of those in respect of width is not mandatory. - Compliance with requirements related to the minimum width of the platform is not mandatory for existing stations if the cause of non-compliance is the presence of certain platform obstacles (e.g. structural columns, stairwells, lifts, etc.) or existing tracks that are unlikely to be moveable. - Where an existing station, or a part of it, is a recognised historic building and is protected by UK law, it is allowed to adapt the requirements of this NTSN in order not to infringe the UK law for the protection of the building.

G2.1.3.1 See also the following in point 7.1.1 of the ACC NTSN:

Where stations which were closed for a long time to passenger service are put in service again, this may be treated as renewal or upgrade in accordance with point 7.2.

G2.1.3.2 Attention is drawn to chapter 3.7.1 of the ERA Application Guide, relating to the point above for re-opening of stations:

The purpose of this sentence is to clarify the case of the re-opening of stations in contexts such as the re-opening of lines. In case a station is re-opened to passenger service after being closed because no service was provided, it should not be considered as a new station subject to full compliance with the requirements of chapter 4 but as an upgraded existing station, subject to a gradual improvement of accessibility including conformity with the TSI only for those parts that are upgraded.

G2.1.3.3 These extracts are relevant in determining the applicability of requirements for a project involving existing infrastructure.

G2.1.3.4 The GB station operator licence also requires compliance with the DfT Code of Practice which widens the application of the NTSN.

G2.1.3.5 For any existing station project it is good practice to consult and involve disabled people's representatives and relevant local organisations.

G2.2 Obstacle-free route

ACC NTSN

4.2.1.2 Obstacle-free route

(1) Obstacle free routes shall be provided that interconnect the following public areas of the infrastructure if provided:
- stopping points for other connecting modes of transport within the station confines (for example, taxi, bus, tram, metro, ferry, etc.)
- car parks
- accessible entrances and exits
- information desks
- visual and audible information systems
- ticketing facilities
- customer assistance
- waiting areas
- toilet facilities
- platforms

(2) All obstacle-free routes, footbridges and subways, shall have a free width of a minimum of 160 cm except in areas that are specified in points 4.2.1.2.1(3) (HVM), 4.2.1.3.(2) (doors), 4.2.1.12(3) (platforms) and 4.2.1.15(2) (level crossings). The length of the obstacle-free routes shall be the shortest practical distance.

(3) Obstacle-free route floor surfaces and ground surfaces shall have low reflecting properties.

4.2.1.2.1 Horizontal circulation

(1) Not used.

(2) Where thresholds are installed on a horizontal route, they shall contrast with the surrounding floor and shall not be higher than 2,5 cm.

(3) Where Hostile Vehicle Mitigation (HVM) measures which intersect the obstacle- free routes introduce occasional narrowing of the route, this restricted width shall have a free width of at least 120 cm and shall not extend to more than 2 metres in length.

4.2.1.2.2 Vertical circulation

(1) Where an obstacle-free route includes a change in level, there shall be a step-free route providing an alternative to stairs for mobility impaired people.

(2) Steps and stairs on the obstacle-free routes shall have a minimum width of 160 cm measured between the handrails.

(2a) As a minimum the first and last steps of a flight of stairs shall be indicated by a contrasting band. This requirement shall apply from a single step.
(2b) As a minimum tactile warning surface indicators shall be installed before the first descending step of staircases of two steps or more.
(3) Ramps shall be installed for persons with disabilities and persons with reduced mobility unable to use stairs where lifts are not provided. They shall have a moderate gradient. A steep gradient is allowed for ramps on short distances only.
(4) Stairs of two steps or more and ramps shall be provided with handrails on both sides and at two levels.
(5) Lifts shall be provided where ramps are not available and shall be at least of type 2 in accordance with the specification referenced in Appendix A, index [1.1]. Type 1 lifts are allowed in the case of stations being renewed or upgraded only.
(6) Escalators and moving walks shall be designed in accordance with the specification referenced in Appendix A, index [2.1].
(7) Level track crossings can form part of an obstacle-free route when they comply with the requirements of point 4.2.1.15.

4.2.1.2.3 Route identification

(1) Obstacle-free routes shall be clearly identified by visual information as detailed in point 4.2.1.10.
(2) Information on the obstacle-free route shall be given to visually impaired people by tactile and contrasting walking surface indicators as a minimum. This point does not apply to obstacle free routes to and from car parks.
(2a) If more than one facility of a certain type of public area are provided, the route to at least one of them shall be indicated by tactile and contrasting walking surface indicators.
(3) Use of alternative measures requires an exemption from this NTSN by the Department for Transport as 'competent authority', and is subject to the criteria set out in Subsection 7 'Exemptions from the NTSN' of the Summary of this NTSN.
(4) If there are handrails or walls within reach along the obstacle-free route to the platform, they shall have brief information (for example platform-number or direction-information). The information shall be in Braille or in prismatic-letters or numbers. The information shall be located on the handrail, or on the wall at a height between 145 cm and 165 cm.

G2.2.1 See *G2.1.1* for information on the different categories of parameters: The first category where technical details are provided, and the second category where only functional requirements are given; and the status of referenced ENs in each case. The ERA Application Guide states that the following parameters are in the second category:

a) Reflectance of the floor surface, the ground surface, or both;
b) Characteristics of the contrasting band and tactile warning surface indicator;
c) Characteristics of ramps; and
d) Height of handrails.

G2.2.2 The specification referenced in Appendix A, index 1, related to Vertical Circulation, lifts, is BS EN 81-70:2021+A1:2022 (Point 5.3.1, table 3, Table 4 points (c), (h), (j) and (k)).

G2.2.3 The specification referenced in Appendix A, index 2, related to Vertical Circulation, escalators and moving walkways, is BS EN 115-1:2017.

G2.2.4 BS EN 16584-1:2017 sets out information on assessment of colour contrast for markings.

G2.2.5 Additional information on obstacle free routes is set out in BS EN 16587:2017, consistent with the requirements in the ACC NTSN.

G2.2.6 For 4.2.1.2 (2) the shortest route may not be the most practical, taking into account the range of users.

G2.2.7 It is noted that the DfT Code of Practice recommends 2000 mm (200 cm) width for obstacle free routes. This is not a conflict as the ACC NTSN sets minimum requirements which must be met in all areas, whereas the larger value in the code of practice is guidance.

G2.2.8 It is good practice for contrasting nosings to be provided on all treads of a flight of stairs. There is no requirement for the contrasting band to be yellow.

G2.2.9 There is no information on what is considered a 'moderate' or a 'steep' gradient for a ramp in this context. The DfT document 'Inclusive Mobility: a guide to best practice on access to pedestrian and transport infrastructure' advises that *'... an 8% (1 in 12) slope is the maximum that may be used; anything greater than this will cause difficulties for manual wheelchair users ... 5% (1 in 20) is preferred.'* It also states that *'Steeper gradients than these can be managed by some wheelchair users, but only over very short distances (1000 mm or less) ... Even over these short distances the maximum gradient used should be no more than 10% (1 in 10). As a general rule, however, 8% (1 in 12) should be used as the absolute maximum.'*. The DfT document infers that 5% (1 in 20) is a moderate gradient and 8% (approximately 1 in 12) is a steep gradient.

G2.2.10 The ERA Application Guide refers to BS ISO 21542:2021 section 6.4.2 and Tables 6 and 7 for possible information on ramps. Table 6 gives the maximum gradient of a slope for a range of lengths and the values are consistent with the figures above.

G2.2.11 The DfT Code of Practice sets out standards for unobstructed progress and ramps.

G2.2.12 It is good practice to use a type 2 lift as this will accommodate a wheelchair user and an accompanying person. A type 1 lift does not accommodate an accompanying person.

G2.2.13 Further information on Obstacle Free Routes is set out in the ERA Application Guide.

G2.2.14 The industry position, facilitated and led by RSSB, is that tactile surfaces for guiding people with visual impairments are best used following consultation with the

intended end-users, and other users who may be affected by the use of such surfaces. It is not good practice to install tactile wayfinding simply to apply the NTSN and former TSI requirement in isolation, without considering risks, and other legislation and standards holistically. The industry mirror group proposed that tactile and contrasting walking surface indicators could be omitted where the route is indicated unambiguously by built or natural elements, such as edges and surfaces that can be followed tactually and visually, but this permission was not taken forward in the ACC NTSN. In some circumstances tactile surfaces can present problems to users in wheelchairs or with other mobility issues and it is good practice to consider and balance the interests of different user groups.

G2.2.15 The following RSSB research reports also provide useful information:

a) T158 (2005) for tactile surfaces in stations;
b) T321 (2006) for good practice for wayfinding at stations; and
c) T881 (2010) for the evaluation of wayfinding systems in stations.

G2.2.16 Projects are welcome to seek advice from RSSB when they are considering the use of tactile wayfinding, or applying to the DfT for exemptions against the ACC NTSN and dispensations against the DfT Code of Practice. Further information regarding exemptions and the use of innovative solutions is given in sub section 7 of the summary of the ACC NTSN.

G2.3 Floor surfaces

ACC NTSN
4.2.1.4 Floor surfaces

(1) All floor coverings, ground surfaces and stair tread surfaces shall be slip resistant.
(2) Within the station buildings there shall be no irregularities in excess of 0,5 cm at any given point in floor walking surface areas, except for thresholds, drainage channels and tactile walking surface indicators.

G2.3.1 See *G2.1.1* for information on the different categories of parameters: The first category where technical details are provided, and the second category where only functional requirements are given; and the status of referenced ENs in each case.

G2.3.2 Clause 2.6 of the ERA Application Guide states:

Slip resistance is a parameter of the 2nd category.

The slip resistance characteristics of infrastructure floor coverings can be assessed according to the standards listed in chapter 5, index G.

For external areas, slip resistance can be assessed according to the standards listed in chapter 5, index H.

Other standards can be used according to the rules described in chapter 2.1.

For assessing this parameter, it is sufficient to provide the technical data sheet of the product(s) used as floor covering(s). When tests are realized, the assessment should not consider factors such as snow, ice, sand, rain and leaves.

G2.3.3 The standards referenced in the ERA Application Guide Chapter 5 (different indices) are:

a) Index G for slip resistance of floor surfaces:

i) BS EN 14041:2018;
ii) BS EN 13893:2002 (a dynamic coefficient of friction of 0.3 and higher is acceptable);
iii) BS EN 16165:2021;
iv) BS EN 16584-3:2017 section 6.

b) Index H for slip resistance of ground surfaces:

i) BS EN 1338:2003;
ii) BS EN 1339:2003;
iii) BS EN 1341:2012;
iv) BS EN 16165:2021.

G2.3.4 BS EN 16584-3:2017 sets out information on assessment of slip resistance.

G2.3.5 RIS-7016-INS sets out guidance on platform and coper surfaces which may also be relevant to other station locations.

G2.3.6 It is good practice to avoid irregularities when installing drainage channels.

G2.3.7 The DfT Code of Practice sets out standards for floors.

G2.4 Highlighting of transparent obstacles

ACC NTSI 4.2.1.5	Highlighting of transparent obstacles

(1) Transparent obstacles on or along the routes used by passengers, consisting of glass doors or transparent walls, shall be marked. These markings shall highlight the transparent obstacles. They are not required if passengers are protected from impact by other means - for example, by handrails or continuous benches.

G2.4.1 See *G2.1.1* for information on the different categories of parameters: The first category where technical details are provided, and the second category where only functional requirements are given; and the status of referenced ENs in each case.

G2.4.2 The ERA Application Guide states that the characteristics of markings on transparent obstacles are parameters of the second category, and that acceptable technical means to satisfy the requirement are described in the standards listed in chapter 5, index N (BS ISO 21542:2021, clause 9.1.1.4).

G2.4.3 BS EN 16584-1:2017 sets out information on assessment of colour contrast for markings.

G2.4.4 The DfT Code of Practice sets out standards for transparent obstacles.

G2.4.5 Further information is set out in the ERA Application Guide.

G2.5 Furniture and free-standing devices

ACC NTSN
4.2.1.7 Furniture and free standing devices

(1) All items of furniture and free-standing devices at stations shall contrast with their background, and have rounded edges.
(2) Within the station confines, furniture and free-standing devices (including cantilevered and suspended items) shall be positioned where they do not obstruct blind or visually impaired people, or they shall be detectable by a person using a long cane.
(3) On each platform where passengers are allowed to wait for trains, and at every waiting area, there shall be a minimum of one area fitted with seating facilities and a space for a wheelchair.
(4) When this area is weather protected, it shall be accessible by a wheelchair user.

G2.5.1 See *G2.1.1* for information on the different categories of parameters: The first category where technical details are provided, and the second category where only functional requirements are given; and the status of referenced ENs in each case.

G2.5.2 The ERA Application Guide states that these parameters are in the second category:

a) Contrast with the background; and
b) Minimum height and other characteristics of the guarding.

G2.5.3 BS EN 16584-1:2017 sets out requirements for the assessment of colour contrast for markings and Appendix 2 of the ERA Application Guide provides information on

assessing and comparing light reflectance values (LRV) and references BS ISO 2813:2014.

G2.5.4 In this context 'furniture' is normally taken to include seats, notice boards, waste and recycling containers, and similar items.

G2.5.5 A simple shelter on a platform is not considered a waiting area unless seats are available, information about the departures of trains is available, and people are protected against weather influences such as rain, sun and wind.

G2.5.6 The DfT Code of Practice sets out standards for furniture.

G2.6 Visual Information

ACC NTSN 4.2.1.10	Visual information: signposting, pictograms, printed or dynamic information
(4)	The information concerning the departure of trains (including destination, intermediate stops, platform number and time) shall be available and suitable for reading from a height of 160 cm, with the information not lower that 70 cm, at least in one location in the station.

G2.6.1 Clause 3.2.11 of the ERA Application Guide states:

> The provision of visual information at a height of 160 cm is intended for people with visual impairment for whom, in case of dynamic information, the formula defining the area of use of displays (point 4.2.1.10 of the TSI) is not appropriate for they have vision on a very short distance only. Therefore they need to be able to get their eyes very close to the message that is displayed. According to the size of the information concerning the departure of trains (including destination, intermediate stops, platform number and time), the height of 160 cm should be such that 20 % to 30 % of the information is above that height, taking care that the lower part of the information should not be located below 70 cm (see Figure 5 below).

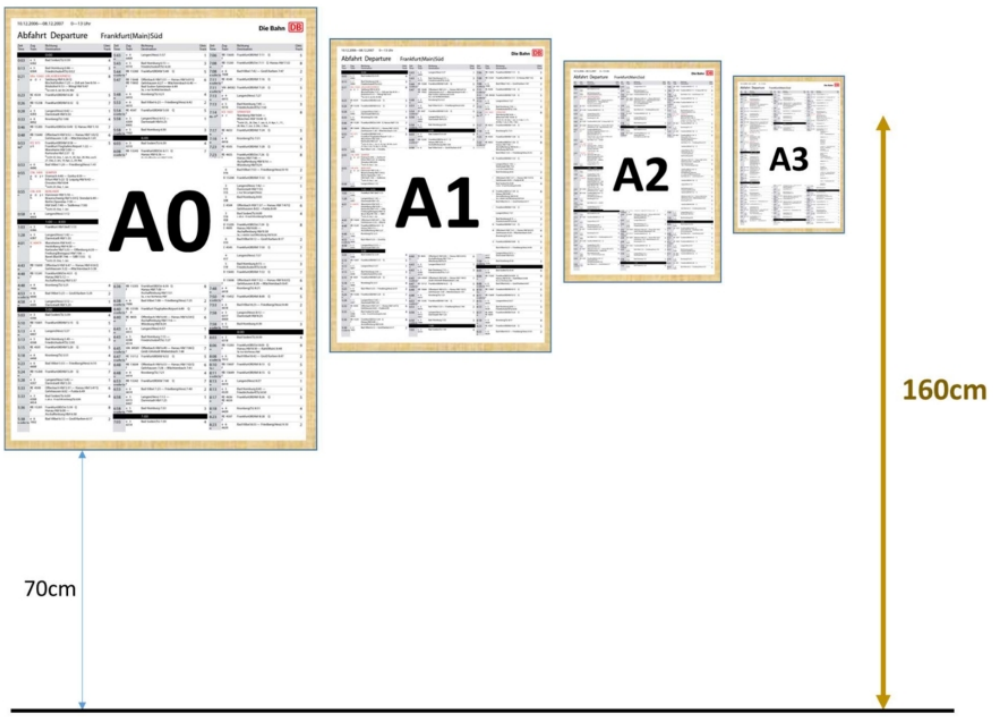


Figure 5: height of information panels (example)

G2.7 Lighting

ACC NTSN
4.2.1.9 Lighting

(1) The illuminance level of the external areas of the station shall be sufficient to facilitate way finding and to highlight the changes of level, doors and entrances.
(2) The illuminance level along obstacle-free routes shall be adapted to the visual task of the passenger. Particular attention shall be paid to the changes of levels, ticket vending offices and machines, information desks and information displays.

(3) The platforms shall be illuminated in accordance with the specification referenced in Appendix A, index [3.1] and index [4.1].
(4) Emergency lighting shall provide sufficient visibility for evacuation and for identification of fire-fighting and safety equipment.

G2.7.1 See *G2.1.1* for information on the different categories of parameters: The first category where technical details are provided, and the second category where only functional requirements are given; and the status of referenced ENs in each case.

G2.7.2 The illuminance levels in points (1) and (2) are parameters of the second category. The ERA Application Guide gives applicable technical means to satisfy the

requirement using the standards listed in chapter 5, index S, which are BS EN 12464-1:2021 and BS EN 12464-2:2014 and BS ISO 21542:2021; other standards can also be used.

G2.7.3 Emergency lighting in point (4) is also a parameter of the second category. The ERA Application Guide gives applicable technical means to satisfy the requirement using the standard listed in chapter 5, index T, which is BS EN 1838:2013; other standards can also be used.

G2.7.4 Illuminance levels for the platforms in point (3) are parameters of the first category and the standards listed in Appendix A are mandated. These are BS EN 12464-2:2014 Table 5.12, except points 5.12.16 and 5.12.19, and BS EN 12464-1:2021 Table 61.1.2.

G2.7.5 RIS-7016-INS contains requirements for the lighting of platforms and provides some guidance on application, noting that only some clauses of BS EN 12464 are called up by the ACC NTSN and those clauses not called up are not mandated. Specific activities or equipment, for example associated with train dispatch, may require specific levels of lighting.

G2.7.6 It is good practice to consider all types of users when selecting types and positions of light fittings to avoid glare. GEGN8613 provides advice on using a human-centred approach to design.

G2.7.7 RIS-7016-INS also provides guidance on the interpretation of platforms as 'Open', 'Covered', or 'Fully enclosed' and the number of passengers as 'Small', 'Medium' or 'Large', as these terms are used without definition in BS EN 12464.

G2.7.8 More general guidance on the lighting of stations is given in RIS-7702-INS.

G2.7.9 The DfT Code of Practice sets out standards for lighting.

G2.8 Platform width and edge of platform

ACC NTSN	
4.2.1.12	Platform width and edge of platform
	(1) It is permitted for the width of the platform to be variable on the whole length of the platform.

(2) The minimum width of the platform is set out in National Technical Rules.
(3) It is permitted to have obstacles on the platform as set out in National Technical Rules.
(4) If there are auxiliary facilities on-board trains, or on the platform, to allow wheelchair users to board on or alight from trains, a free space (no obstacles) of 150 cm from the edge of the facility towards the direction where the wheelchair boards/lands at/to the platform level, shall be provided where such facilities are likely to be used. A new station shall meet this requirement for all trains that are planned to stop at the platform.
(5) The platform edge shall have a visual marking and tactile walking surface indicators in accordance with National Technical Rules.

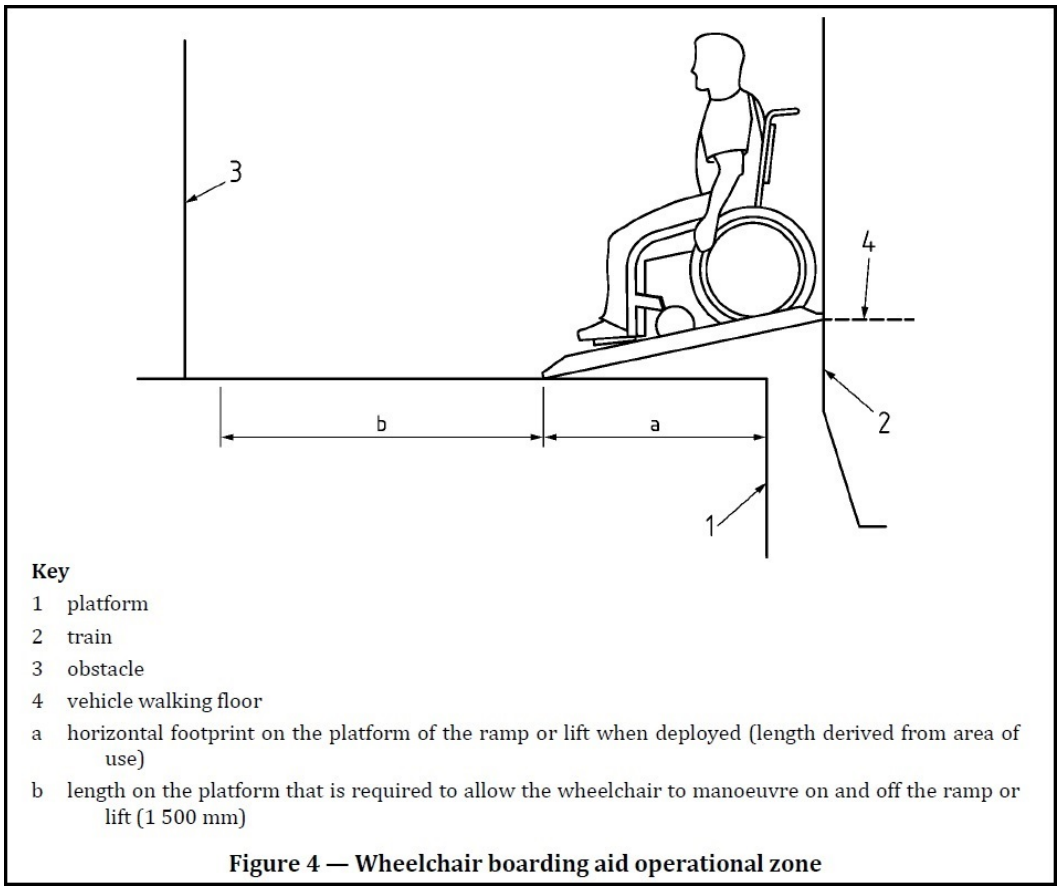
G2.8.1 The changes to this section, compared to the previous PRM NTSN, clarify the GB requirements such that the requirements in domestic standards, which implement the results of GB specific research, are applied consistently as National Technical Rules. This gives clarity to projects about what is required as a minimum to warn visually impaired users of platform risks, ensures tactile surfaces are implemented at a consistent distance from the platform edge across the network which assists visually impaired passengers' awareness of the platform edge, and gives some flexibility for better management of overall risk.

G2.8.2 GIRT7020 is the relevant National Technical Rule (NTR) for the GB mainline network and requirements for platform widths are given directly.

G2.8.3 BS EN 16587:2017 sets out requirements for auxiliary facilities consistent with the ACC NTSN, referring to BS EN 16586-2:2017 for the wheelchair boarding aid operational zone. It is understood that the operational zone:

a) Is to provide space for a passenger who is using a wheelchair to manoeuvre before boarding or after alighting;
b) Applies only to the areas of the platform where the boarding aid is used, namely in the vicinity of the wheelchair-compatible doorways on all types of rolling stock calling at the platform;
c) Applies only in the direction in which the wheelchair is moved onto or off the platform; therefore a boarding aid that incorporates a ninety-degree turn would permit the operational zone to be parallel to the platform edge.

Figure 4 from BS EN 16586-2:2017 illustrates the operational zone, a free space of 1.5 m (1 500 mm) on the platform beyond the edge of the boarding aid:



Key

1 platform
2 train
3 obstacle
4 vehicle walking floor
a horizontal footprint on the platform of the ramp or lift when deployed (length derived from area of use)
b length on the platform that is required to allow the wheelchair to manoeuvre on and off the ramp or lift (1 500 mm)

Figure 4 — Wheelchair boarding aid operational zone

Figure 1: Operational zone from BS EN 16586-2:2017

G2.8.4 It is important to recognise that there are a range of different risks on the platform and that different mitigations may be required for different risks. Mitigation may include the use of signs or markings, but these may not be the most effective mitigation. RSSB research report T1118 (2018) provides useful background on this subject.

G2.8.5 Information on platform markings, including the marking of the platform edge, is set out in RIS-7016-INS. This is based on the RSSB research report T1118 (2018). This explains that the tactile pattern which informs visually impaired passengers of the location of the platform edge is always at a fixed position from the platform edge, to facilitate boarding of trains, regardless of any other risk mitigation measures that may be applied.

G2.8.6 Further guidance on platform widths is set out in GIRT7020 and repeated in RIS-7016-INS. This includes possible mitigation measures where appropriate.

G2.8.7 The height of GB platforms, which is covered by a Specific Case in the INF NTSN, has led to particular practice in managing the risk from the aerodynamic effects of passing trains. The related GB requirements are set out in RIS-7016-INS which also contains a risk assessment methodology and possible mitigation measures which may be appropriate.

G2.8.8 RIS-7016-INS includes guidance on platform and coper surfaces and the DfT Code of Practice sets out requirements for the tactile surface.

G2.8.9 BS EN 16584-1:2017 sets out requirements for the assessment of colour contrast for markings.

G2.8.10 BS EN 16584-3:2017 sets out requirements for the assessment of slip resistance.

G2.9 End of platform

ACC NTSN 4.2.1.13	End of platform
	(1) The end of the platform shall either be fitted with a barrier that prevents public access or shall have a visual marking and tactile walking surface indicators with an attention pattern indicating a hazard.

G2.9.1 RIS-7016-INS sets out additional information on GB practice for barriers at platform ends.

Part 3 Guidance on rolling stock design

G3.1 Rolling stock - general

Guidance

ACC NTSN 2.1.2	Scope related to rolling stock subsystem
	This NTSN applies to rolling stock which is in the scope of the LOC&PAS NTSN and which is intended to carry passengers.
	This NTSN does not apply to rolling stock intended for other purposes than the carriage of persons. Persons accompanying a freight train or riding on other rail vehicles than those intended for passengers shall be subject to conditions set up by the railway undertaking and published on its website.

G 3.1.1 Regulation 45 of RIR 2011 requires all passenger vehicles operating after 1 January 2020 to be '*constructed, renewed, upgraded or modified to comply with ...*':

- The relevant PRM TSIs which were in force before 1 January 2020; or
- The PRM NTSN which replaced the TSIs and any future variations to it; or
- The Rail Vehicle Accessibility (Non-Interoperable Rail System) Regulations (RVAR) 2010, which apply to those vehicles which are not in scope of RIR 2011; or
- The Rail Vehicle Accessibility Regulations (Northern Ireland) 2001, which do not apply to the GB Mainline Railway;

Unless a derogation, determination, dispensation or exemption has been granted.

G 3.1.2 According to section 71B of the Railways Act 1993 (as amended), the DfT Code of Practice identifies standards relevant for all passenger train and station operators in Great Britain in relation to protecting the interests of users of railway passenger services or station services who are disabled. Licensed operators have an obligation to establish and comply with a Disabled People's Protection Policy (DPPP), paying due regard to the DfT Code of Practice, whenever they install, renew or replace infrastructure or facilities.

G 3.1.3 Appendix F of the ACC NTSN states that compliance with some requirements of the NTSN '*is not mandatory*' when vehicles are renewed or upgraded. However, Regulation 45 of RIR 2011 requires all rail vehicles to meet minimum accessibility standards. Where vehicles in service, built before 1999, have been upgraded to meet targeted compliance levels and have been granted dispensations, this means there is a need to consult with DfT regarding any further renewals or upgrades.

G 3.1.4 Application of the ACC NTSN to upgrades of existing rolling stock, built to RVAR standards, is complex. If complying with any requirements in the NTSN and the DfT Code of Practice proves challenging, then it is good practice for the applicant to engage with the DfT at the earliest opportunity. DfT as the Competent Authority in the context of RIR 2011 can consider determinations (on whether a modification constitutes a renewal or upgrade) and any dispensations in relation to the ACC NTSN and the Code of Practice.

G3.2 Seats

G3.2.1 General

> ACC NTSN
> 4.2.2.1 Seats
> 4.2.2.1.1 General
>
> (1) Handholds or vertical handrails or other items that can be used for personal stability, whilst using the aisle, shall be provided on all aisle-side seats unless the seat, when in the upright position, is within 200 mm of:
> - the back of another seat facing in the opposite direction which is fitted at its aisle side with a handhold or a vertical handrail or other items that can be used for personal stability
> - a handrail or a partition provided at the aisle side of the seat.
>
> (2) Handholds or other items that can be used for personal stability shall be positioned at a height of between 800 mm and 1 200 mm above the floor, measured from the centre of the usable part of the handhold, shall not protrude into the clearway and shall contrast with the seat.
>
> (3) In seating areas with fixed longitudinal seats, handrails shall be used for personal stability. These handrails shall be at a maximum distance of 2 000 mm apart, shall be positioned at a height of between 800 mm and 1 200 mm above the floor and shall contrast with the vehicle interior surroundings.
>
> (4) The handholds or other items shall not have sharp edges.

G3.2.1.1 Additional requirements for seats are set out in BS EN 16585-2:2017, consistent with the requirements in the ACC NTSN.

G3.2.1.2 Research report T1140 (2019) and guidance note GMGN2696 provide additional information on seat comfort.

G3.2.1.3 See *G3.10* for guidance on handrail design.

G3.2.1.4 Structural design requirements for seat back handholds and handrails are set out in GMRT2100.

G3.2.1.5 GMRT2100 also sets out guidance for geometric radii and other interior passive safety considerations to reduce the risk of injury to passengers and staff.

G3.2.1.6 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance is not mandatory if the work would require structural alterations to door portals (interior or external), underframes, collision pillars, vehicle bodies, vehicle over-ride protection, or more generally if the work would necessitate re-validation of the vehicle structural integrity.

Compliance with point 4.2.2.1 with regard to seat back grab handles is only mandatory if the seat structures are renewed or upgraded within an entire vehicle.

However, attention is drawn to section *G3.1* of this document.

G3.2.1.7 In the following example scenarios, it may be appropriate for the new seats to be designed and validated against the requirements originally applied to the existing seats:

a) A rearrangement of interior seating requires additional seats of the same design;
b) If the underlying vehicle structure (for example, a seat rail extrusion) is not able to withstand the structural requirements of seats compliant with the ACC NTSN.

G3.2.2 Priority seats

ACC NTSN
4.2.2.1.2 Priority seats
4.2.2.1.2.1 General

(1) Not less than 10 per cent of the seats by fixed trainset or individual vehicle, and by class shall be designated as priority seats for the use of persons with disabilities and persons with reduced mobility.
(2) The priority seats and vehicles containing them shall be identified by signs complying with Appendix N. It shall be stated that other passengers shall make such seats available to those who are eligible to use them when required.
(3) The priority seats shall be located within the passenger saloon and in close proximity to external doors. In double deck vehicles or trainsets, priority seats can be present on both decks.
(4) The level of equipment fitted to the priority seats shall, as a minimum, be the same as that fitted to general seats of the same type.
(5) When seats of a certain type are fitted with armrests, priority seats of the same type shall be fitted with movable armrests. This excludes armrests placed along the vehicle body side or along a partition wall in case of compartments. The movable armrest shall move into a position in line with the seat back cushion to enable unrestricted access to the seat or to any adjacent priority seats.
(6) Priority seats shall not be tip-up seats.
(7) Each priority seat and the space available to its user shall comply with the specification referenced in Appendix A, index [16.1].
(8) The whole useful sitting surface of the priority seat shall be a minimum of 450 mm wide (see specification referenced in Appendix A, index [16.1]).
(9) The top of each priority seat cushion shall be between 430 and 500 mm above floor level at the front edge of the seat.

> (10) The clear headroom above each seat shall be at least 1 680 mm from floor level, except on double-decker trains on which luggage racks are provided above the seats. In such case reduced headroom of 1 520 mm is permitted for priority seats underneath the luggage racks, provided that at least 50 % of priority seats maintain headroom of 1 680 mm.
> (11) Where reclining seats are fitted, the dimensions shall be measured when the seats are in their fully upright position.

G3.2.2.1 Additional requirements for priority seats are set out in BS EN 16584-2:2017 and BS EN 16585-2:2017, consistent with the requirements in the ACC NTSN; for example, the signs to indicate priority seats set out in Annex A of BS EN 16584-2:2017 are identical to those shown in Appendix N of the ACC NTSN.

G3.2.2.2 Appendix N of the ACC NTSN refers to:

a) Symbol 0100 as defined in BS ISO 7000:2019 for wheelchair accessible areas; and
b) Symbol PIPF 006 as defined in BS ISO 7001:2023 for wheelchair accessible areas.

GB practice is to use Symbol PIPF 006 as defined in BS ISO 7001:2023.

G3.2.2.3 Good practice for identifying priority seats is given in Key Train Requirements (KTR) v7.

G3.2.2.4 See also *G3.2.1* for general requirements for seats.

G3.2.2.5 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with point 4.2.2.1.2 with regard to the dimensions of priority seats and around is only mandatory if the seating layout is altered within an entire train and this can be achieved without reducing the existing capacity of the train. In that case the maximum number of priority seats shall be provided.
>
> Compliance with requirements regarding headroom above priority seating is not mandatory if the limiting factor is a luggage rack that is not being structurally altered during the renewal or upgrading work.

However, attention is drawn to section *G3.1* of this document.

G3.2.2.6 Priority seats are needed to ensure that seats are made available to those passengers who are least able to stand. It is good practice to ensure that any text accompanying the signs for priority seats is written to reflect this.

G3.2.2.7 The design requirements for priority seats are intended to provide support and comfort to people who may find it difficult to get into and out of the seat.

G3.2.2.8 Moveable armrests are provided so that passengers can slide into the seat without obstruction and a support is available if needed.

G3.2.2.9 Additional legroom is helpful to assist mobility.

G3.3 Wheelchair spaces

ACC NTSN
4.2.2.2 Wheelchair spaces

(1) According to the length of the unit, excluding the locomotive or power head, there shall be in that unit not less than the number of accessible wheelchair spaces shown in the following table:
[Table 5 not reproduced]

(2) To ensure stability, the wheelchair space shall be designed for the wheelchair to be positioned either facing or back to the direction of travel.

(3) Over the full length of the wheelchair space the width shall be 700 mm from floor level to a minimum height of 1 450 mm with an additional 50 mm width to give clearance for hands on each side that is adjacent to any obstacle that will inhibit clearance for the wheelchair users hands (e.g. wall or structure) from a height of 400 mm to 800 mm above floor level (if one side of the wheelchair is adjacent to the aisle there is no additional 50 mm requirement for that side of the wheelchair as it is already free space).

(4) The minimum distance in the longitudinal plane between the back of the wheelchair space and the next surface shall be in accordance with the specification referenced in Appendix A, index [16.4].

(5) There shall be no obstruction of the designated space between the floor and the ceiling of the vehicle other than an overhead luggage rack, a horizontal handrail in accordance with the requirements of point 4.2.2.9 attached to the wall or ceiling of the vehicle, or a table.

(6) The back of the wheelchair space shall be a structure or other acceptable fitting of at least 700 mm wide. The height of the structure, or fitting, shall be capable of preventing a wheelchair that has been positioned with its back against the structure or fitting, from tipping over backwards.

(7) Tip-up seats may be installed in the wheelchair space but, when in the stowed position, shall not encroach on the dimensional requirements of the wheelchair space.

(8) There shall be no equipment such as bicycle hooks or ski racks in the wheelchair space or directly in front of it.

(9) At least one seat shall be available either side-by-side or face-to-face to each of the wheelchair spaces for a companion to travel with the wheelchair user. This seat shall offer the same level of comfort as the other passenger seats, and may also be situated on the opposing side of the aisle.

> (10) On trains with a design speed higher than 250 km/h excepting double deck trains, it shall be possible for a wheelchair user occupying a wheelchair space to transfer onto a passenger seat that shall be equipped with a movable armrest. Such transfer is made by the wheelchair user in autonomy. In that case, it is allowed that the companion seat is shifted to another row. This requirement is applicable up to the number of wheelchair spaces per unit specified in table 5.

G3.3.1 Design requirements for wheelchair areas on rail vehicles are set out in BS EN 16585-2:2017, consistent with the requirements in the ACC NTSN.

G3.3.2 BS EN 16585-2:2017 notes that '*This may result in the wheelchair being either facing or back to the direction of travel*'; however, it is good practice to allow flexibility for the wheelchair user to decide which direction to travel in as long as the NTSN requirements are met for both directions.

G3.3.3 See *G3.10* for guidance on handrails, ACC NTSN point 4.2.2.9.

G3.3.4 GMRT2100 gives guidance on interior passive safety requirements for wheelchair areas on rail vehicles.

G3.3.5 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> The provision of wheelchair spaces is only required when the seating layout is altered within a complete train formation. However, if the entrance doorway, or clearways, cannot be modified to enable wheelchair access, a wheelchair space needs not be provided if the seating layout is altered. Wheelchair spaces created in an existing rolling stock may be arranged in accordance with the specification referenced in appendix A, index [16.5].
>
> The provision of a transfer seat is only mandatory when it does not require modifying the layout of an existing wheelchair space.

However, attention is drawn to section *G3.1* of this document.

G3.3.6 The minimum dimensions for the wheelchair space are based on the size and manoeuvrability of the interoperable wheelchair, as defined in Appendix M of the ACC NTSN. This is the same as defined in Annex A of BS EN 16585-1:2017, and in Annex III of the DfT Code of Practice.

G3.3.7 Anything that intrudes into the space could reduce the room for a wheelchair user to get into position; this can include temporary items such as luggage or bags of rubbish. It is therefore good practice to provide operational rules ensuring that wheelchair spaces do not become obstructed, even when not in use.

G3.3.8 Since accessibility specifications were drawn up, many wheelchairs are larger and heavier, and many are powered. These factors can make them more difficult to manoeuvre into a tight space. The NTSN requirements are a minimum; hence it is

good practice to maximise the wheelchair space for the size and weight of wheelchair that can be accommodated, so far as is compatible with safe operation.

G3.3.9 There is some confusion over whether the mobility aids referred to as 'mobility scooters' should be accommodated on board a rail vehicle. A mobility scooter meeting the dimensional and weight limits set out in Appendix M of the ACC NTSN is considered as a wheelchair.

G3.3.10 Whilst wheelchairs and mobility scooters with larger dimensions may be able to access rolling stock, they may not be able to access all relevant facilities such as toilets.

G3.3.11 The ACC NTSN Operating Rules section 4.4.2.20 Providing services on-board trains, requires operational means to provide services that cannot be accessed directly by some passengers.

G3.4 Doors

G3.4.1 General

ACC NTSN
4.2.2.3 Doors
4.2.2.3.1 General

(1) These requirements apply only to doors providing access to another public part of the train, with the exclusion of toilet doors.
(2) To latch or unlatch a manually operated door, for use by the public, the control device shall be operable by the palm of the hand exerting a force not exceeding 20 N.
(3) Door controls, whether manual, pushbuttons or other devices, shall contrast with the surface on which they are mounted.
(4) Their interface with passengers shall comply with the specifications of point 5.3.2.1.
(5) If both open and closed door control devices are fitted one above the other, the top device shall always be the open control.

5.3.2.1 Interface of the door control device

(1) A door control device shall have visual indication, on or around it when enabled and shall be operable by the palm of the hand exerting a force not greater than 15 N.
(2) It shall be identifiable by touch (for example: tactile markings); this identification shall indicate the functionality.

G3.4.1.1 Additional requirements for doors and their controls are set out in BS EN 16584-2:2017 and BS EN 16585-3:2017.

G3.4.1.2 Requirements for contrast are set out in BS EN 16584-1:2017.

G3.4.2 Exterior doors

ACC NTSN
4.2.2.3 Doors
4.2.2.3.2 Exterior doors

(1) All exterior passenger doorways shall have a minimum clear useable width of 800 mm when open.
(2) On trains with a design speed lower than 250 km/h, wheelchair access doors offering a level access as defined in point 2.3 shall have a minimum clear useable width of 1 000 mm when open.
(3) All exterior passenger doorways shall be marked on the outside in a way that gives a contrast to the vehicle body-side surrounding them.
(4) The designated wheelchair exterior accessible doorways shall be the closest doorways to the designated wheelchair spaces.
(5) The doors to be used for wheelchair access shall be clearly labelled with a sign in accordance with Appendix N.
(6) From the inside of the vehicle the position of external doorways shall clearly be marked by use of contrasted adjacent flooring.
(7) Audible and visible signals shall be given to persons inside and outside the train when doors are operated or about to operate.
(8) The door operating signals are the following
(a) When a door is released for opening, a door opening signal shall be given; it shall last a minimum of 5 seconds unless the door is operated, in which case it may cease after 3 seconds.
(b) When a door is automatically or remotely opened by the driver or other member of the train crew, a door opening signal shall be given; it shall last a minimum of 3 seconds from the moment the door starts to open.
(c) When a door, that is automatically or remotely closed, is about to operate, a door closing signal shall be given; it shall start a minimum of 2 seconds before the door starts to close and shall continue until the door is closed.
(d) When a door is closed locally (by a passenger or crew), a door closing signal shall be given; it shall start following the operation of the control device and shall continue until the door is closed.
(9) This provision has been left intentionally blank.
(10) The sound source for door signals shall be in the area local to the control device.
If there is no control device, the sound source for door signals shall be located adjacent to the doorway.
If a separate sound source is used for the door closing signal, it can be either local to the control device or adjacent to the doorway.
If an external door finding signal is provided, its sound source shall be located in the area local to the control device, and the sound source for the door closing signal shall be located in the area adjacent to the doorway.

(11) The visible signals shall be visible from inside and outside the train and shall be located such that they minimise the opportunity for them to be obscured by passengers located in the vestibule. Visible signals shall be in accordance with the specification referenced in Appendix A, index [19.1].
(12) Passenger doors audible signals shall be according to the specification in Appendix G.
(13) The method of door activation shall be by train crew, semi-automatic (for instance, passenger pushbutton operation) or automatic.
(14) The door control shall be located either next to or on the door leaf.
(15) The centre of exterior door opening control, operable from the platform, shall be not less than 800 mm and not more than 1 200 mm measured vertically above platforms, for all platforms for which the train is designed. If the train is designed for a single platform height, the centre of exterior door opening control shall be not less than 800 mm and not more than 1 100 mm measured vertically above that platform height.
(16) The centre of internal door opening control for the exterior door shall be not less than 800 mm and not more than 1 100 mm measured vertically above the vehicle floor level.

G3.4.2.1 Additional requirements for exterior doors are set out in BS EN 16584-2:2017, including visible and audible signals and tactile markings consistent with the requirements in the ACC NTSN.

G3.4.2.2 Requirements for positioning of controls for exterior doors are set out in BS EN 14752:2019+A1:2021; these are consistent with the requirements in the ACC NTSN.

G3.4.2.3 Requirements for contrast are set out in BS EN 16584-1:2017.

G3.4.2.4 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

Compliance with requirements to define the interior position of external doorways by contrast at floor level is only mandatory when the floor covering is renewed or upgraded.

Compliance with requirements to provide door opening and closing signals is only mandatory when the door control system is renewed or upgraded.

Full compliance with requirements regarding the position and illumination of door controls is only mandatory when the door control system is renewed or upgraded and when the controls can be re-positioned without alteration to the vehicle structure or door. However, in such an event, the renewed or upgraded controls shall be installed as close as possible to the compliant position.

However, attention is drawn to section *G3.1* of this document.

G3.4.2.5 Contrast between the door and bodyside helps people with visual impairment to identify where the doors are located, so that they can be prepared to board.

G3.4.2.6 When using vinyls or other graphics on the vehicle exterior, there is a risk of contravening colour contrast requirements if graphics were to intrude onto the surface of the door. Contrast is vital for people with visual impairment; a lack of contrast could also cause confusion for people with dementia.

G3.4.2.7 Where external doors are modified or replaced, it is important to maintain the contrast.

G3.4.2.8 Audible signals on the doors to alert passengers when they are unlocked are necessary for people with visual impairment:

a) They indicate which side of the train is adjacent to the platform; and
b) They help people both to locate the button and to know when it is ready to use.

G3.4.2.9 The positioning of the door controls is intended to provide a comfortable height for the greatest number of people.

G3.4.2.10 The requirement for the device to be useable with the palm of the hand is to help people who have limited fine finger movement, for example due to arthritis.

G3.4.2.11 Colour contrast around the door control button helps people with visual impairment or a degree of confusion to locate it.

G3.4.2.12 The requirement that the button can be identified by touch will help those with little or no sight who are not helped by the colour contrast.

G3.4.3 Interior doors

ACC NTSN
4.2.2.3 Doors
4.2.2.3.3 Interior doors

(1) Internal automatic and semi-automatic doors shall incorporate devices that prevent passengers becoming trapped during operation of the doors.
(2) Interior doors that are made available for wheelchair users shall have a minimum clear useable width of 800 mm.
(3) The force required to open or close a manual door shall not exceed 60 N.
(4) The centre of interior door controls shall be not less than 800 mm and not more than 1 100 mm measured vertically above the vehicle floor level.
(5) Automatic inter-vehicle connecting doors shall operate either synchronously as a pair, or the second door shall automatically detect the person moving towards it and open.
(6) If more than 75 % of a door's surface is made of a transparent material, it shall be clearly marked with visual indicators.

G3.4.3.1 Additional requirements for interior doors are set out in BS EN 16585-3:2017, including positioning of controls consistent with the requirements in the ACC NTSN.

G3.4.3.2 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with the requirements for door control operation operating forces and positioning is only mandatory if the door and door mechanism and/or control is being upgraded or renewed.

However, attention is drawn to section *G3.1* of this document.

G3.4.3.3 RSSB research report T1036 (2015) includes a proposed performance specification for power operated internal doors, aimed at mitigating the associated risks that have led to passenger injuries.

G3.5 Lighting

> ACC NTSN
> 4.2.2.4 Lighting
>
> (1) Minimum values of average illuminance in the passenger areas shall be in accordance with the specification referenced in Appendix A, index [6.1]. Requirements relative to the uniformity of these values are not applicable for conformity with this NTSN.

G3.5.1 Illuminance and uniformity requirements are set out in BS EN 13272-1:2019; this is the latest version of the specification referenced in Appendix A, index 6, as applicable to heavy rail. Requirements and guidance for emergency lighting are set out in RIS-2730-RST.

G3.5.2 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with the requirement is not required if it can be established that there is insufficient capacity in the electrical system to support additional load, or that such lighting cannot locally be accommodated without structural alterations (doorways etc.).

However, attention is drawn to section *G3.1* of this document.

G3.5.3 Clear and consistent lighting is very important for anyone with visual impairment or dementia and for all those who lack confidence in walking on a moving train. For people with dementia, pools of light and shadows can look like dark holes or pools of water, and can therefore cause confusion.

G3.6 Toilets

G3.6.1 General

ACC NTSN

4.2.2.5 Toilets

(1) When toilets are fitted in a train, a universal toilet shall be provided accessible from the wheelchair space.
(2) The standard toilet shall be compliant with the requirements of points 5.3.2.2 and 5.3.2.3.
(3) The universal toilet shall be compliant with the requirements of points 5.3.2.2 and 5.3.2.4.
(4) When toilets are fitted in a train a baby nappy changing facility shall be provided. If separate nursery facilities are not provided or if separate nursery facilities are provided but are not accessible to a wheelchair user, a table shall be incorporated within the universal toilets. It shall be compliant with the requirements of point 5.3.2.5.

5.3.2.2 Standard and universal toilets: common parameters

(1) The centre of any door handle, lock or door control device on the exterior or interior of the toilet compartment shall be located at a minimum of 800 mm and a maximum of 1 100 mm above the toilet door threshold.
(2) A visual and tactile (or audible) indication shall be given inside and outside the toilet to indicate when a door has been locked.
(3) Any door control device and other equipment inside the toilet compartment (except for baby nappy change facilities and call for aid devices) shall be operable by exerting a force not exceeding 20 N.
(4) Any control device, including flushing system, shall contrast with the background surface, and shall be identifiable by touch.
(5) Clear, precise information for the operation of any control device shall be provided, making use of pictograms and shall be tactile.
(6) The toilet seat and lid, and any handrails shall contrast with the background.
(7) If both opened and closed door control devices are fitted one above the other, the top device shall always be the open control.
(8) Automatic and semi-automatic doors shall incorporate devices that prevent passengers becoming trapped during operation of the doors.
(9) The force required to open or close a manual door shall not exceed 60 N.

G3.6.1.1 Detailed requirements for toilets are set out in BS EN 16585-1:2017; these are consistent with the requirements in the ACC NTSN.

G3.6.1.2 Many disabled and older people do not need the additional space provided by the universal toilet. People with vision loss may find it easier to orientate themselves and find fixtures and fittings in a smaller space. For this reason, many of the requirements

apply to both the standard toilet and the universal toilet; everyone is helped by clear colour contrast, for example on the toilet seat and grab handles. It is good practice to ensure there is no sill at the entrance to the toilet as this presents a tripping hazard for children as well as many older and disabled people.

G3.6.1.3 The positioning of grab handles and all other features in the toilet have been set to make them as easy as possible to use.

G3.6.1.4 The requirements for colour contrast on the toilet seat and grab handles are to help people with visual impairment and those with dementia to locate the facilities.

G3.6.1.5 It is good practice to ensure that pictograms, for example indicating taps, water and soap, are clear and easily understood as they can be confusing for many people.

G3.6.1.6 Easy-to-use taps and toilet flush are helpful to people with arthritis or other conditions that limit strength and fine finger movement. It is good practice to provide non-contact actuation where possible.

G3.6.1.7 Examples of pictograms for public facilities are given in BS ISO 7001:2023. Requirements for design of public information symbols are set out in BS ISO 22727:2007.

G3.6.1.8 It is good practice to ensure that nothing is fitted inside the toilet compartment, including vinyls, that may make it harder for people to find the essential features or which may cause confusion, for example by detracting from the clarity of the door control mechanisms.

G3.6.2 Standard toilet

ACC NTSN
4.2.2.5 Toilets
5.3.2.3 Standard toilet

(1) A standard toilet is not designed to be accessible to a wheelchair user.
(2) The minimum door useable width shall be 500 mm.
(3) A fixed vertical and/or horizontal handrail according to point 4.2.2.9 shall be provided adjacent to the toilet seat and the wash basin.

G3.6.2.1 See *G3.6.1* for general guidance on toilets.

G3.6.2.2 See *G3.10* for guidance on handrails, point 4.2.2.9 of the ACC NTSN.

G3.6.3 Universal toilet

ACC NTSN
4.2.2.5 Toilets
5.3.2.4 Universal toilet

(1) A universal toilet is a toilet designed to be used by all passengers including all persons with disabilities and persons with reduced mobility.
(2) The area of use of a universal toilet is defined by the method used for its assessment (A or B according to point 6.1.3.1).
(3) The toilet access door shall provide a minimum clear useable width of 800 mm. Where the door is automatic or semi-automatic, it shall be possible to open it partially in order to allow a wheelchair user's assistant to leave and re-enter the toilet module.
(4) The exterior of the door shall be marked with a sign in accordance with appendix N.
(5) There shall be sufficient space inside the toilet compartment to enable a wheelchair as defined in appendix M to be manoeuvred to a position allowing both a lateral and a diagonal transfer of the wheelchair occupant to the toilet seat.
(6) There shall be a minimum clear space of 700 mm in front of the toilet seat that shall follow the seat profile.
(7) A horizontal handrail that complies with the requirements of point 4.2.2.9 shall be provided at each side of the toilet seat extending at least to the leading edge of the toilet seat.
(8) The handrail on the wheelchair accessible side shall be hinged in such a way so as to enable an unobstructed transfer for the wheelchair user to and from the toilet seat.
(9) The surface of the toilet seat, when lowered, shall be at a height of 450 mm to 500 mm above the floor level.
(10) All amenities shall be readily accessible to a wheelchair user.
(11) The toilet cubicle shall be fitted with not less than two call for aid devices that shall, when operated, send a signal to a person who can take appropriate action; they need not initiate a communication.
(12) The interface of the call for aid devices shall be as defined in point 5.3.2.6.
(13) One call for aid device shall be placed not more than 450 mm above the floor, measured vertically from the surface of the floor to the centre of the control. It shall be positioned so that the control can be reached by a person lying on the floor.
(14) The other call for aid device shall be not less than 800 mm and not more than 1 100 mm above the floor, measured vertically to the centre of the control.
(15) These two call for aid devices shall be located on different vertical surfaces of the cubicle so that they can be reached from a range of positions.

(16) The control of the call for aid devices shall be distinct from any other control within the toilet, be coloured differently from other control devices and contrast with their background.
(17) If a baby nappy changing table is provided, in the lowered position its usable surface shall be between 800 mm and 1 000 mm above floor level.

G3.6.3.1 See *G3.6.1* for general guidance on toilets.

G3.6.3.2 See *G3.10* for guidance on handrails, point 4.2.2.9 of the ACC NTSN.

G3.6.3.3 See *G3.14* for guidance on call for aid devices.

G3.6.3.4 Appendix N of the ACC NTSN refers to:

a) Symbol 0100 as defined in BS ISO 7000:2019 for wheelchair accessible areas; and
b) Symbol PIPF 006 as defined in BS ISO 7001:2023 for wheelchair accessible areas.

GB practice is to use Symbol PIPF 006 as defined in BS ISO 7001:2023.

G3.6.3.5 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

Provision of a fully compliant universal toilet is only mandatory when existing toilets are being completely renewed or upgraded and a wheelchair space is provided and a compliant universal toilet can be accommodated without structural alteration to the vehicle body.

The provision of call for aid devices in the universal toilet is not mandatory if the vehicle does not have an electrical communications system that can be adapted to include such a device.

However, attention is drawn to section *G3.1* of this document.

G3.6.3.6 The specifications for the universal toilet are intended to create the maximum possible space for a wheelchair user to get in and out, turn the wheelchair and use the toilet.

G3.6.3.7 For those who rely totally on the universal toilet, finding it out of service during a journey is distressing and potentially embarrassing. It is good practice to ensure that reasonable steps are taken to inform a pre-booked wheelchair user before the start of the journey if the universal toilet is known to be out of service. Extra vigilance on maintenance can also help to avoid problems.

G3.6.4 Baby nappy changing table

ACC NTSN
4.2.2.5 Toilets
5.3.2.5 Baby nappy changing table

(1) The usable surface of the baby nappy changing table shall be a minimum of 500 mm wide and 700 mm long.
(2) It shall be designed to prevent a baby from inadvertently sliding off, shall have no sharp edges and shall be able to take a minimum load of 80 kg.
(3) It shall be possible to put it into the stowed position with only one hand, using a force not exceeding 25 N.

G3.6.4.1 Detailed requirements for toilets, including baby nappy changing tables, are set out in BS EN 16585-1:2017; these are consistent with the requirements in the ACC NTSN.

G3.7 Clearways

ACC NTSN
4.2.2.6 Clearways

(1) From the vehicle entrance, the following sections of the clearway shall be in accordance with the specification referenced in Appendix A, index [17]
- through the vehicles,
- between connecting vehicles of a single trainset,
- to and from wheelchair accessible doors, wheelchair spaces and wheelchair accessible areas including sleeping accommodation and universal toilets if provided.

(2) The minimum height requirement does not need to be verified in:
- all areas of double-deck vehicles,
- gangways and door areas of single deck vehicles.
In those areas, reduced headroom is accepted as a consequence of structural constraints (gauge, physical space).

(3) A turning space, with a minimum diameter of 1 500 mm, shall be provided adjacent to the wheelchair space and in other locations where wheelchairs are supposed to turn 180˚. The wheelchair space may be part of the turning circle.

(4) If a change in direction is required for a wheelchair user, the clearway width of both corridors or corridor and door shall be in accordance with the specification referenced in Appendix A, index [17.4].

7.3.2.4	Clearways (point 4.2.2.6) UK Specific Case (Great Britain) 'P' For reasons of restricted structure gauge, track curvature and consequent restricted vehicle width, it is permissible for clause 4.2.2.6 (1st bullet) to be complied with only for access to priority seats. This specific case does not prevent the access of NTSN compliant rolling stock to the national network.

G3.7.1 Detailed requirements for clearways are set out in BS EN 16585-3:2017; these are consistent with the requirements in the ACC NTSN.

G3.7.2 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with the requirements of point 4.2.2.6 is only mandatory if the seating layout is altered within an entire vehicle and a wheelchair space is being provided.
>
> Compliance with the requirements for clearways between connecting vehicles is only mandatory if the gangway is being renewed or upgraded.

However, attention is drawn to section *G3.1* of this document.

G3.7.3 Unimpeded clearways will assist all persons who need to move through the train during a journey, particularly older people and others who have sight or mobility problems. It is therefore good practice to minimise, or completely avoid incorporating, any features that could become a tripping hazard.

G3.8 Customer information

G3.8.1 General

ACC NTSN 4.2.2.7 4.2.2.7.1	Customer Information General (1) The following information shall be provided: - Safety Information and safety instructions, - Audible safety instructions coupled with visible signals in case of emergency, - Warning, prohibition and mandatory action signs, - Information concerning the route of the train, including information about delays and unplanned stops, - Information concerning the location of on-board facilities. (2) Visual information referred to in point (1) shall contrast with its background.

(3) The typeface used for texts referred to in point (1) shall be easily readable.
(4) Time information presented in digits shall be in the 24 h system.

G3.8.1.1 Detailed requirements for information are set out in BS EN 16584-2:2017, including the characteristics of 'easily readable' typefaces; these are consistent with the requirements in the ACC NTSN.

G3.8.1.2 Details regarding contrast are set out in BS EN 16584-1:2017.

G3.8.1.3 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with the requirements of point 4.2.2.7 in respect of route information is not mandatory at renewal or upgrade. However, where an automated route information system is installed as part of a renewal or upgrade programme, it shall comply with the requirements of this point.
>
> Compliance with the other parts of point 4.2.2.7 shall be mandatory whenever signage or interior finishes are renewed or upgraded.

However, attention is drawn to section *G3.1* of this document.

G3.8.1.4 Audible and visual information during a train journey is helpful for people with visual or hearing impairment, and for many other older and disabled people; clear and well-timed information can be a source of reassurance.

G3.8.2 Signage, pictograms and tactile information

ACC NTSN
4.2.2.7 Customer Information
4.2.2.7.2 Signage, pictograms and tactile information

(1) All safety, warning, mandatory action and prohibition signs shall include pictograms and shall be designed according to the specification referenced in Appendix A, index [7.1].
(2) There shall be no more than five pictograms, in addition to a directional arrow, indicating a single direction placed adjacent to each other at a single location.
(3) The following specific pictograms shall be fitted with the wheelchair symbol in accordance with Appendix N:
- Directional information for wheelchair accessible amenities
- Indication of the wheelchair accessible door location outside the train
- Indication of the wheelchair space inside the train
- Indication of the universal toilets
The symbols can be combined with other symbols (for example: carriage number, toilet, etc.).

(4) Where inductive loops are fitted these shall be indicated by a pictogram complying with appendix N.
(5) In universal toilets, where hinged handrails are provided, a pictogram showing the rail in both the stowed and deployed positions shall be provided.
(6) If a vehicle provides reserved seats then the number or letter of that vehicle (as used in the reservation system) shall be displayed externally on or adjacent to all its access doors. The number or letter shall be displayed in characters not less than 70 mm high and shall be visible when the door is open and closed.
(7) If seats are identified by numbers or letters, the number or letter of the seat shall be displayed on or adjacent to every seat in characters not less than 12 mm high. Such numbers and letters shall contrast with their background.
(8) Tactile information signage shall be fitted in:
- Toilets and wheelchair accessible sleeping accommodation, for functional information and call for aid device if appropriate
- Rolling stock, for the open/close button of passenger accessible doors and call for aid devices.

G3.8.2.1 Detailed requirements for information are set out in BS EN 16584-2:2017; these are consistent with the requirements in the ACC NTSN and include details regarding size of signs and the characters thereon, fonts and colours.

G3.8.2.2 BS EN 16584-2:2017 also includes the requirement to design pictograms in accordance with BS ISO 3864-1:2011, which is the specification referenced in Appendix A, index 7.

G3.8.2.3 The HSE Guidance for Safety Signs and Signals (2015) provides guidance on signage which is consistent with the requirements set out in BS ISO 3864-1:2011.

G3.8.2.4 Appendix N of the ACC NTSN refers to:

a) Symbol 0100 as defined in BS ISO 7000:2019 for wheelchair accessible areas;
b) Symbol PIPF 006 as defined in BS ISO 7001:2023 for wheelchair accessible areas; and
c) Clause 4.3.1.2 of ETSI EN 301 462 (2000-03) for signs indicating inductive loops.

GB practice is to use Symbol PIPF 006 as defined in BS ISO 7001:2023 for wheelchair accessible areas.

G3.8.2.5 The requirements for labelling are based on the most easily legible forms and sizes of typeface for people with visual impairment and learning disability. Deviation from these requirements could reduce the legibility of the information.

G3.8.2.6 Before deciding to develop a safety sign, it is good practice to employ the principle of the hierarchy of risk control; this considers whether other, more effective, reasonably practicable measures may reduce the risk. The process of risk control can be logically extended to risks to the travelling public. The Health and Safety Executive's (HSE) Guidance on Regulations (2015) elaborates on this concept and states that employers should ensure that safety signs are provided (or are in place) and maintained in

circumstances where there is a significant risk to health and safety that has not been removed or controlled by other means. Other measures could include engineering controls or safe systems of work. Safety signage is not a substitute for these other measures; rather, signage is only to be implemented where it can further reduce the risk.

G3.8.2.7 RIS-0733-CCS sets out further guidance on this principle, outlining the steps to be taken to understand how necessary a sign is. BS ISO 9186-1:2014 sets out testing methods for assessing comprehension of signs.

G3.8.2.8 It is good practice to assess the need for changes to signage when vehicles are refurbished, and in the light of industry intelligence such as National Incident Reports (NIRs; see RIS-8250-RST), RIS-2730-RST and Rail Accident Investigation Branch (RAIB) reports.

G3.8.2.9 See also *G3.8.1.3* regarding renewal and upgrade.

G3.8.3 Dynamic visual information

ACC NTSN
4.2.2.7 Customer Information
4.2.2.7.3 Dynamic visual information

(1) The final destination or route shall be displayed on the outside of the train on the platform side adjacent to at least one of the passenger access doors on at least alternate vehicles of the train.
(2) Where trains operate in a system in which dynamic visual information is given on the station platform every 50 m or less, and destination or route information is also provided on the front of the train, it is not mandatory to provide information on the sides of vehicles.
(3) The final destination or route of the train shall be displayed inside each vehicle.
(4) The next stop of the train shall be displayed such that it can be read from at least 51 % of passenger seats inside each vehicle including 51 % of the priority seats, and from all wheelchair spaces.
(5) The dynamic visual information system shall have the capability to display the next stop of the train at least two minutes before arrival at the station concerned. If the next station is less than two minutes planned journey time away, the system shall have the capability to display the next station immediately following departure from the previous station.
(6) The requirement in point (4) does not apply to compartment carriages where the compartments have a maximum of 8 seats and are served by an adjacent corridor. However, that information shall be visible to a person standing in a corridor outside a compartment and to a passenger occupying a wheelchair space.
(7) The dynamic visual information system may display information about the next stop on the same support as the final destination.

(8) If the system is automated, it shall be possible to suppress or correct incorrect or misleading information.
(9) Internal and external displays shall comply with the requirements of points (10) to (13). In those points, the term 'display' shall be understood as any support of dynamic information.
(10) Each station name (which may be abbreviated), or words of messages, shall be displayed for a minimum of 2 seconds.
(11) If a scrolling display is used (either horizontal or vertical), each complete word shall be displayed for a minimum of 2 seconds and the horizontal scrolling speed shall not exceed an average of 6 characters per second.
(12) On external displays the minimum character height shall be 70 mm on front displays and 35 mm on side displays.
(13) Internal displays shall be designed for a maximum viewing distance in accordance with the formula in Table 5a:
[Table 5a not reproduced]

G3.8.3.1 Detailed requirements for information are set out in BS EN 16584-2:2017, consistent with the requirements in the ACC NTSN; Table 3 of the EN is identical to Table 13 of the ACC NTSN.

G3.8.3.2 In the previous PRM NTSN some of the detail in this point was contained in Chapter 5. As Internal and External displays are no longer Interoperability Constituents, the relevant text is now included in Chapter 4.

G3.8.3.3 One key part of the successful use of a Passenger Information System is staff training. It is good practice to ensure that staff receive training both in how to program it and in why it is so important to do so.

G3.8.3.4 It is also good practice to ensure that non-scheduled announcements such as train diversion or early termination are provided in both visual and audible forms, otherwise people with hearing loss may not receive the information they need.

G3.8.3.5 See also *G3.8.1.3* regarding renewal and upgrade.

G3.8.4 Dynamic audible information

ACC NTSN
4.2.2.7 Customer Information
4.2.2.7.4 Dynamic audible information

(1) The train shall be fitted with a public address system which shall be used either for routine or emergency announcements by the driver or by another crew member who has specific responsibility for passengers.
(2) The public address system may operate on a manual, an automated or pre-programmed basis. If the public address system is automated, it shall be possible to suppress, or correct, incorrect or misleading information.

(3) The public address system shall be capable of announcing the destination and next stop of the train at each stop, or on departure from each stop.
(4) The public address system shall be capable of announcing the next stop of the train at least two minutes before the arrival of the train at that stop. If the next station is less than two minutes planned journey time away, the next station shall be announced immediately following departure from the previous station.
(5) The spoken information shall have a minimum STI-PA level of 0,45, in accordance with the specification referenced in Appendix A, index [5.2]. The public address system shall meet the requirement at all seat locations and wheelchair spaces.

G3.8.4.1 Detailed requirements for information are set out in BS EN 16584-2:2017, consistent with the requirements in the ACC NTSN. This includes the STI-PA level in accordance with BS EN IEC 60268-16:2020, which is the specification referenced in Appendix A, index 5.

G3.8.4.2 The requirement that next stops are announced two minutes before arrival is to alert people who may need time to get themselves ready to leave the train, so they can move to the exit without stress.

G3.8.4.3 See *G3.8.3.4* regarding the combination of audible and visual information.

G3.8.4.4 See *G3.8.1.3* regarding renewal and upgrade.

G3.9 Height changes

ACC NTSN
4.2.2.8 Height changes

(1) Internal steps (other than those for external access) shall have a maximum height of 200 mm and a minimum depth of 280 mm, measured at the central axis of the stairs. For double deck trains it is permitted to reduce this value to 270 mm for the stairs accessing the upper deck and the lower deck.
(2) As a minimum the first and the last step shall be indicated by a contrasting band extending the full width of the steps on both the front and the top surfaces of the step nosing with a depth of:
- 45 mm to 55 mm on the front surface
- 45 mm to 75 mm on the top surface.
(3) Stairs constituted of more than three steps shall be provided with handrails on both sides and at two levels. The higher handrail shall be positioned at a height of 850 mm to 1 000 mm above floor level. The lower handrail shall be positioned at a height of 500 mm to 750 mm above floor level.

(4) Stairs constituted of one, two or three steps shall be provided on both sides with a minimum of one handrail or other item that can be used for personal stability.
(5) Handrails shall be compliant with point 4.2.2.9.
(6) No steps are allowed between the vestibule of a wheelchair accessible exterior door, the wheelchair space, a universal sleeping compartment and the universal toilet except for a door threshold strip that shall not exceed 15 mm in height or except in case that a lift is provided to overcome the step. The lift shall comply with the requirements of point 5.3.2.10. [Table 6 not reproduced]

G3.9.1 Detailed requirements for height changes are set out in BS EN 16585-2:2017 and BS EN 16585-3:2017; these are consistent with the requirements in the ACC NTSN. Tables 4 and 5 in BS EN 16585-3:2017 replicate Table 6 of the ACC NTSN.

G3.9.2 Requirements for contrast are set out in BS EN 16585-1:2017.

G3.9.3 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

Compliance with the requirements of point 4.2.2.8 is not mandatory at renewal or upgrade. However a contrasting warning band on step nosings shall be provided when tread surfaces are renewed or upgraded.

However, attention is drawn to section *G3.1* of this document.

G3.10 Handrails

ACC NTSN
4.2.2.9 Handrails

(1) All handrails fitted to a vehicle shall be round in section with an outside diameter of 30 mm to 40 mm, and shall have a minimum clear distance of 45 mm to any adjacent surface other than its mountings.
(2) If a handrail is curved, the radius to the inside face of the curve shall be a minimum of 50 mm.
(3) All handrails shall contrast with their background.
(4) External doorways shall be provided with handrails on both sides, fitted internally as close as practicable to the vehicle outer wall. Exception can be made for one side of the doorway if it is fitted with a device such as an on-board lift.
(5) The handrails referred to in point (4) shall be:
- vertical handrails that shall extend from 700 mm to 1 200 mm above the threshold of the first step for all external doorways.
- additional handrails at a height of between 800 mm and 900 mm above the first useable step and parallel with the line of the step nosing for doorways with more than two entrance steps.

(6) Where the clearway of the gangway is narrower than 1 000 mm and longer than 2 000 mm there shall be handrails or handholds provided in, or adjacent to, inter-vehicle gangways that are provided for passenger use.
(7) Where the clearway of the gangway is wider than or equal to 1 000 mm handrails or handholds shall be provided in the gangway.

G3.10.1 Detailed requirements for handrails are set out in BS EN 16584-2:2017, consistent with the requirements in the ACC NTSN.

G3.10.2 Requirements for contrast are set out in BS EN 16584-1:2017.

G3.10.3 The ERA Application Guide states that the reference point for measurements relative to a handrail is the centre of the handrail.

G3.10.4 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with the requirements of point 4.2.2.9 is only mandatory where existing handrails are being renewed or upgraded.

However, attention is drawn to section *G3.1* of this document.

G3.10.5 Many older and disabled people rely on well positioned grab handles/grab rails to enable them to move safely along the train, particularly when it is moving. The requirements specify the size, position, finish and colour contrast necessary for the grab handles.

G3.10.6 All of these requirements are based on the best diameter for someone with an arthritic hand to be able to grip comfortably, thus enabling people to travel safely and with confidence.

G3.11 Wheelchair accessible sleeping accommodation

ACC NTSN 4.2.2.10 Wheelchair accessible sleeping accommodation

(1) When a train is equipped with sleeping accommodation for passengers, it shall provide a vehicle containing at least one wheelchair accessible sleeping accommodation.
(2) If there is more than one vehicle with sleeping accommodation for passengers in a train, there shall be not less than two wheelchair accessible sleeping accommodations in the train.
(3) If a rail vehicle provides wheelchair accessible sleeping accommodation, the exterior of the relevant vehicle door and the wheelchair accessible sleeping accommodation door shall be marked with a sign in accordance with appendix N.

(4) The wheelchair accessible sleeping accommodation internal space shall take in consideration the requirements of point 4.2.2.6 for actions expected from the wheelchair user in the sleeping accommodation.
(5) The sleeping accommodation shall be fitted with not less than two call for aid devices that shall when operated, send a signal to a person who can take appropriate action; they need not initiate a communication.
(6) The interface of the call for aid devices shall be as defined in point 5.3.2.6.
(7) One call for aid device shall be placed not more than 450 mm above the floor, measured vertically from the surface of the floor to the centre of the control. It shall be positioned so that the control can be reached by a person lying on the floor.
(8) The other call for aid device shall be not less than 600 mm and not more than 800 mm above the floor measured vertically to the centre of the control.
(9) The call for aid devices described in points (7) and (8) shall be located on different vertical surfaces of the sleeping accommodation.
(10) The call for aid devices shall be distinct from any other control within the sleeping accommodation, be coloured differently from other control devices and contrast with their background.

G3.11.1 Detailed requirements for wheelchair accessible sleeping accommodation are set out in BS EN 16585-2:2017, consistent with the requirements in the ACC NTSN.

G3.11.2 Appendix N of the ACC NTSN refers to:

a) Symbol 0100 as defined in BS ISO 7000:2019 for wheelchair accessible areas; and
b) Symbol PIPF 006 as defined in BS ISO 7001:2023 for wheelchair accessible areas.

GB practice is to use Symbol PIPF 006 as defined in BS ISO 7001:2023.

G3.11.3 BS EN 16585-3:2017 sets out the means of assessing the actions expected from the wheelchair user.

G3.11.4 See *G3.14* for guidance on call for aid devices.

G3.11.5 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

Compliance with the requirement to provide wheelchair accessible sleeping accommodation is only mandatory when existing sleeping accommodation is being renewed or upgraded.

The provision of call for aid devices in the wheelchair accessible sleeping accommodation is not mandatory if the vehicle does not have an electrical communications system that can be adapted to include such a device.

However, attention is drawn to section *G3.1* of this document.

G3.12 Step position for vehicle access and egress

G3.12.1 General requirements

ACC NTSN
4.2.2.11 Step position for vehicle access and egress
4.2.2.11.1 General requirements

(1) It shall be demonstrated that the point situated in the central position on the nose of the access step of each passenger access door on both sides of a vehicle in working order with new wheels standing centrally on the rails, shall be located inside the surface identified as 'step location' on the figure 1 below. [Figure 1 not reproduced]

(2) The values of bq_0, δ_h, δ_{v+} and δ_{v-} depend on the type of platform where the rolling stock is intended to stop. They shall be as follows:
- bq_0 shall be calculated based on the gauge of the track in which the train is intended to operate in accordance with the specification referenced in Appendix A, index [8.1]. Gauges are defined in chapter 4.2.3.1 of INF NTSN.
- δ_h, δv_+ and δ_{v-} are defined in tables 7 - 9. [Tables 7 - 9 not reproduced]
For one step, values of the table 7 above apply, and for the next step towards the vehicle interior the following values apply, based upon a nominal platform height of 760 mm: [Table 9 not reproduced]

(3) The technical documentation requested in point 4.2.12 of the LOC&PAS NTSN shall include information about:
- the height and offset of the theoretical platform resulting in a vertical gap (δ_{v+}) of 230 mm and in a horizontal gap (δ_h) of 200 mm from the point situated in the central position of the nose of the rolling stock's lowest step on a straight level track.
- the height and offset of the theoretical platform resulting in a vertical gap (δ_{v-}) of 160 mm and in a horizontal gap (δ_h) of 200 mm from the point situated in the central position of the nose of the rolling stock's lowest step on a straight level track.

7.3.2.6 Step position for vehicle access and egress (point 4.2.2.11)

UK Specific Case (Great Britain) 'P' for all rolling stock intended to stop, in normal operation at platforms of nominal 915 mm height.

Passenger access steps for the vehicle shall be designed to meet the requirements set out in the National Technical Rules.

G3.12.1.1 Detailed requirements for steps are set out in BS EN 16586-1:2017, consistent with the requirements in the ACC NTSN. Tables A.1 to A.3 in Annex A of BS EN 16586-1:2017 are identical to Tables 7 to 9 in the ACC NTSN.

G3.12.1.2 A vehicle that complies with the general requirements of the ACC NTSN could result in excessive, and therefore potentially unsafe, stepping distances on many GB platforms. The ACC NTSN therefore refers to the GB NTR for step position, set out in GMRT2173.

Not only does this cater for the wide range of platform heights on GB legacy infrastructure, it also sets out rules for platforms on track radii less than 300 m.

G3.12.1.3 See also GIGN7608 which describes the GB specific case for platform offset set out in the Infrastructure NTSN.

G3.12.1.4 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

> Compliance with the requirements of points 4.2.2.11 and 4.2.2.12 is not mandatory at renewal or upgrade. However, if moveable steps or other integral boarding aids are fitted, they shall comply with the relevant provisions of those points.

However, attention is drawn to section *G3.1* of this document.

G3.12.2 Access/egress steps

ACC NTSN
4.2.2.11 Step position for vehicle access and egress
4.2.2.11.2 Access/egress steps

(1) All steps for access and egress shall be slip resistant and shall have an effective clear width as large as the doorway width.
(2) Internal steps for external access shall have a minimum depth of 240 mm between the vertical edges of the step and a maximum height of 200 mm. The height of each step may be increased to a maximum of 230 mm if it can be demonstrated that this achieves a reduction of one in the total number of steps required.
(3) The rising height of each step shall be equal.
(4) As a minimum the first and the last steps shall be indicated by a contrasting band with a depth of 45 mm to 55 mm extending a minimum of 80 % of the width of the steps on the top surface of the step nosing. A similar band shall indicate the front surface of the last step when entering the unit.
(5) An external access step, fixed or moveable, shall have a maximum height of 230 mm between steps and a minimum depth of 150 mm.
(6) If a step board is fitted and it is an extension of a door sill outside the vehicle, and there is no change in level between the step board and the floor of the vehicle, this shall not be considered to be a step for the purposes of this specification. A minimal drop in level, with a maximum of 60 mm, between the floor surface at door sill and that of the exterior of the vehicle, used to guide and seal the door is also permissible and shall not be considered as a step.
(7) Access to the vestibule shall be achieved with a maximum of 4 steps of which one may be external.

(8) Rolling stock intended to stop, in normal operation, at existing platforms below 380 mm height and having their passenger access doors above bogies need not comply with points (2) and (5) above if it can be demonstrated that this achieves a more even distribution of the steps height.

G3.12.2.1 Detailed requirements for access and egress steps are set out in BS EN 16586-1:2017, consistent with the requirements in the ACC NTSN.

G3.12.2.2 Requirements for slip resistance are set out in BS EN 16584-3:2017.

G3.12.2.3 Requirements for contrast are set out in BS EN 16584-1:2017.

G3.12.2.4 See also *G3.12.1.2* for guidance regarding GB legacy infrastructure.

G3.13 Boarding aids

G3.13.1 General

ACC NTSN
4.2.2.12 Boarding aids

(1) A secure storage system shall be provided to ensure that boarding aids, including portable ramps, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.
(2) The following types of boarding aids may be present in the rolling stock according to the rules defined in point 4.4.3:
4.2.2.12.1 Movable step and bridging plate
4.2.2.12.2 On-board ramp
4.2.2.12.3 On-board lift

G3.13.1.1 Detailed requirements for boarding aids are set out in BS EN 16586-2:2017, consistent with the requirements in the ACC NTSN.

G3.13.1.2 BS EN 16586-2:2017 states that the assessment of 'secure' is intended to mean that only authorised members of staff can access the device. However, attention is also drawn to the requirements for interior passive safety set out in GMRT2100.

G3.13.1.3 Appendix F of the ACC NTSN states the following for when rolling stock is renewed or upgraded:

Compliance with the requirements of points 4.2.2.11 and 4.2.2.12 is not mandatory at renewal or upgrade. However, if moveable steps or other integral boarding aids are fitted, they shall comply with the relevant provisions of those points.

However, if a wheelchair space in accordance with point 4.2.2.3 is created at renewal or upgrade, then it shall be mandatory to provide some form of boarding aid in accordance with point 4.4.3.

However, attention is drawn to section *G3.1* of this document.

G3.13.2 Movable step and bridging plate

ACC NTSN
4.2.2.12 Boarding aids
4.2.2.12.1 Movable step and bridging plate

(1) A moveable step is a retractable device integrated into the vehicle lower than the door threshold level, fully automatic and activated in conjunction with the door opening/closing sequences.
(2) A bridging plate is a retractable device integrated into the vehicle as close as possible to the door threshold level, fully automatic and activated in conjunction with the door opening/closing sequences.
(3) In the case of the movable step or bridging plate extending beyond that permitted by the gauging rules, the train shall be immobilised whilst the step or plate is extended.
(4) The extension of the moveable step or bridging plate shall be completed before the door opening permits the passengers to cross and conversely, removal of the step or plate may only begin when the door opening no longer permits any crossing of passengers.
(5) Movable steps and bridging plates shall comply with the requirements of point 5.3.2.8.

5.3.2.8 Boarding aids: movable steps and bridging plates

(1) A movable step or bridging plate shall be designed and assessed for an area of use defined by the width of the doorway it can fit.
(2) The mechanical strength of the device shall be according to the specification referenced in Appendix A, index [11.1].
(3) A suitable mechanism shall be installed in order to ensure the stability of the device in the deployed and retracted position.
(4) The device surface shall be slip resistant and shall have an effective clear width as large as the doorway width.
(5) The device shall be equipped with obstacle detection according to the specification referenced in Appendix A, index [11.2].
(6) The device shall incorporate a method of deploying and stowing if the power to the step fails.

G3.13.2.1 Detailed requirements for boarding aids are set out in BS EN 16586-2:2017, consistent with the requirements in the ACC NTSN.

G3.13.2.2 The specification referenced in Appendix A, index 11, of the ACC NTSN is BS EN 14752:2019+A1:2021.

G3.13.2.3 Requirements for slip resistance are set out in BS EN 16584-3:2017.

G3.13.2.4 See also *G3.13.1.3* for guidance on requirements when vehicles are renewed or upgraded.

G3.13.3 On-board ramp

ACC NTSN
4.2.2.12 Boarding aids
4.2.2.12.2 On-board ramp

(1) An on-board ramp is a device that is positioned between the vehicle door threshold and the platform. It can be manual, semi-automatic or automatic.
(2) On-board ramps shall comply with the requirements of point 5.3.2.9.

5.3.2.9 Boarding aids: on-board ramps

(1) Ramps shall be designed and assessed for an area of use defined by the maximum vertical gap they can overcome within a maximum slope of 18 % (10.2°).
(2) Ramps shall withstand a weight of at least 300 kg, placed at the centre of the ramp distributed over an area of 660 mm by 660 mm.
(3) An access ramp shall be either positioned manually by staff or deployed semi-automatically by mechanical means, operated by staff or by the passenger.
(4) If the ramp is power operated it shall incorporate a method of manual operation should power fail.
(5) The ramp surface shall be slip resistant and shall have an effective clear width of a minimum of 760 mm.
(6) Ramps having a clear width of less than 1 000 mm shall have raised edges on both sides to prevent mobility aid wheels from slipping off.
(7) The upstands at both ends of the ramp shall be bevelled and shall not be higher than 20 mm. They shall have contrasting hazard warning bands.
(8) When in use for boarding or alighting, the ramp shall be secured in use so that it is not subject to displacement when loading or unloading.
(9) A semi-automatic ramp shall be fitted with a device capable of stopping the movement of that step if its front edge comes into contact with anything or person whilst the plate is in movement.
(10) The ramp shall be provided with self-contrasting markings.

G3.13.3.1 Detailed requirements for boarding aids are set out in BS EN 16586-2:2017, consistent with the requirements in the ACC NTSN.

G3.13.3.2 The minimum load capacity of 300 kg is based on the weight of the wheelchair transportable by train as set out in Appendix M of the ACC NTSN. It is good practice to design ramps to accommodate the total weight of passenger, wheelchair, items carried on the wheelchair, and any persons assisting the boarding or alighting process.

G3.13.3.3 Requirements for slip resistance are set out in BS EN 16584-3:2017.

G3.13.3.4 Requirements for contrast are set out in BS EN 16584-1:2017.

G3.13.3.5 A ramp is not considered to be '*secured in use*' by methods that rely on friction between the ramp and the train or platform surfaces. Good practice in the design and securing arrangements for ramps is given in the Key Train Requirements (KTR) v7.

G3.13.3.6 See also *G3.13.1.3* for guidance when vehicles are renewed or upgraded.

G3.13.4 On-board lift

ACC NTSN
4.2.2.12 Boarding aids
4.2.2.12.3 On-board lift

(1) An on-board lift is a device integrated into the doorway area of a vehicle that shall be able to overcome the maximum height difference between the vehicle floor and the station platform where operated.
(2) When the lift is in the stowed position the doorway shall have a minimum useable width in accordance with point 4.2.2.3.2.
(3) On-board lifts shall comply with the requirements of point 5.3.2.10.

5.3.2.10 Boarding aids: on-board lifts

(1) Lifts shall be designed and assessed for an area of use defined by the maximum vertical gap they can overcome.
(2) The lift platform surface shall be slip resistant. At surface level, the lift platform shall have a minimum clear width of 760 mm and a length of 1 200 mm. According to appendix M, an additional length of 50 mm shall be available for feet above a height of 100 mm above the lift platform, considering both inboard and outboard orientations of the wheelchair user.
(3) The bridging plate overriding the gap between the lift platform and the carriage floor shall have a minimum width of 720 mm.
(4) The lift shall withstand a weight of at least 300 kg, placed at the centre of the lift platform distributed over an area of 660 mm by 660 mm.
(5) Where provided, each control for deploying, lowering to ground level, raising and stowing the lift shall require continuous manual pressure and shall not allow an improper lift sequencing when the lift platform is occupied.
(6) The lift shall incorporate a method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails.

(7) No part of the lift platform shall move at a rate exceeding 150 mm/second during lowering and lifting an occupant, and shall not exceed 600 mm/second during deploying or stowing (except if the lift is manually deployed or stowed).
(8) The maximum lift platform horizontal and vertical acceleration when occupied shall be 0,3 g.
(9) The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair from rolling off the lift platform during its operation.
(10) A movable barrier or inherent design feature shall prevent a wheelchair from rolling off the edge closest to the vehicle until the lift is in its fully raised position.
(11) Each side of the lift platform which extends beyond the vehicle in its raised position shall have a barrier a minimum 25 mm high. Such barriers shall not interfere with manoeuvring into or out of the aisle.
(12) The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair from riding over or defeating it.
(13) The lift shall permit both inboard and outboard orientation of the wheelchair user.
(14) The lift shall be provided with self-contrasting markings.

G3.13.4.1 Detailed requirements for boarding aids are set out in BS EN 16586-2:2017, consistent with the requirements in the ACC NTSN.

G3.13.4.2 Requirements for slip resistance are set out in BS EN 16584-3:2017.

G3.13.4.3 Requirements for contrast are set out in BS EN 16584-1:2017.

G3.13.4.4 See also *G3.13.1.3* for guidance when vehicles are renewed or upgraded.

G3.14 Call for aid devices

Guidance

G 3.14.1 The human interface requirements of the call for aid devices are set out in BS EN 16584-1:2017, BS EN 16584-2:2017 and BS EN 16585-1:2017.

G 3.14.2 The functional operation of call for aid devices and their integration into train control systems is set out in BS EN 16683:2015.

Definitions

good practice	A process or method that has been shown to work well; succeeds in achieving its objective(s); is widely accepted; and therefore can be recommended as an approach.
interoperable wheelchair transportable by train	A wheelchair the characteristics of which permit the full usage of all features of rolling stock designed for wheelchair users. The characteristics of an interoperable wheelchair transportable by train are within the limits specified in Appendix M of the ACC NTSN.
level access	Access from a platform to the doorway of rolling stock for which it can be demonstrated that: • The gap between the door sill of that doorway (or of the extended bridging plate of that doorway) and the platform does not exceed 75 mm measured horizontally and 50 mm measured vertically; and • The rolling stock has no internal step between the door sill and the vestibule. **Note:** The ERA Application Guide clarifies that this applies 'considering a track radius 300 m and straight level track.' **Note:** These dimensions are intended to enable a wheelchair user to board and alight unassisted although this may not be possible for some users.
shelter	A structure with a roof for weather protection but not necessarily walls. **Note:** A simple shelter on a platform is not to be understood as a waiting area unless it has all the relevant characteristics.
STI-PA	Speech transmission index for public address systems
waiting area	A place to wait for the departure of the train having all the following characteristics: • Seats are available; • Information about the departures of trains is available; and • People are protected against weather influences, such as rain, sun and wind.

References

The Standards catalogue gives the current issue number and status of documents published by RSSB: http://www.rssb.co.uk/railway-group-standards.

RGSC 01	Railway Group Standards Code
RGSC 02	Standards Manual

Documents referenced in the text

Railway Group Standards

GIRT7020	GB Requirements for Platform Height, Platform Offset and Platform Width
GMRT2100	Rail Vehicle Structures and Passive Safety
GMRT2173	Size of Vehicles and Position of Equipment

RSSB documents

GEGN8601	General Guidance for NTSNs
GEGN8613	Application of Human Factors within Safety Management Systems
GIGN7608	Guidance on the Infrastructure Technical Specification for Interoperability
GMGN2696	Assessment of Passenger Seat Comfort
RIS-0733-CCS	Lineside Operational Signs
RIS-2730-RST	Vehicle Fire Safety and Evacuation
RIS-7016-INS	Interface between Station Platforms, Track, Trains and Buffer Stops
RIS-7702-INS	Rail Industry Standard for Lighting at Stations
RIS-8250-RST	Reporting High Risk Defects
RSSB Research Report T158 (2005)	The use of tactile surfaces at rail stations
RSSB Research Report T321 (2006)	Wayfinding at stations: A good practice guide
RSSB Research Report T881 (2010)	Evaluating wayfinding systems for blind and partially sighted customers at stations
RSSB Research Report T1036 (2015)	Onboard Injuries Associated with Internal Train Doors: Appendix G - Performance Specification for Power Operated Internal Doors on Passenger Carrying Rail Vehicles
RSSB Research Report T1118 (2018)	Optimising the design and position of platform markings designed to keep people away from the platform edge

RSSB Research Report T1140 (May 2019)	Defining the requirements of a seat comfort selection process

Other references

ACC NTSN	National Technical Specification Notice Accessibility (ACC) Issue 1 published by Department for Transport on 2nd May 2025
Accessible Travel Policy Guidance	Accessible travel policy: Guidance for train and station operators, Office of Rail and Road, 16 September 2020
BS 9992:2020	Fire safety in the design, management and use of rail infrastructure. Code of practice
BS EN 81-70:2021 +A1:2022	Safety rules for the construction and installation of lifts. Particular applications for passenger and goods passenger lift. Accessibility to lifts for persons including persons with disability
BS EN 115-1:2017	Safety of escalators and moving walks. Construction and installation
BS EN 1338:2003	Concrete paving blocks. Requirements and test methods.
BS EN 1339:2003	Concrete paving flags. Requirements and test methods.
BS EN 1341:2012	Slabs of natural stone for external paving. Requirements and test methods.
BS EN 1838:2013	Lighting applications. Emergency lighting
BS EN 12464-1:2021	Light and lighting. Lighting of work places. Part 1: Indoor work places
BS EN 12464-2:2014	Light and lighting. Lighting of work places. Part 2: Outdoor work places
BS EN 13272-1:2019	Railway applications. Electrical lighting for rolling stock in public transport systems. Part 1: Heavy rail
BS EN 13893:2002	Resilient, laminate and textile floor coverings. Measurement of dynamic coefficient of friction on dry floor surfaces
BS EN 14041:2018	Resilient, textile and laminate floor coverings. Essential characteristics
BS EN 14752:2019 +A1:2021	Railway applications. Bodyside entrance systems for rolling stock
BS EN 16165:2021	Determination of the slip resistance of pedestrian surfaces. Methods of evaluation
BS EN 16584-1:2017	Railway applications. Design for PRM use. General requirements. Part 1: Contrast
BS EN 16584-2:2017	Railway applications. Design for PRM use. General requirements. Part 2: Information

BS EN 16584-3:2017	Railway applications. Design for PRM use. General requirements. Part 3: Optical and friction characteristics
BS EN 16585-1:2017	Railway applications. Design for PRM use. Equipment and components on board rolling stock. Part 1: Toilets
BS EN 16585-2:2017	Railway applications. Design for PRM use. Equipment and components on board rolling stock. Part 2: Elements for sitting, standing and moving
BS EN 16585-3:2017	Railway applications. Design for PRM use. Equipment and components on board rolling stock. Part 3: Clearways and internal doors
BS EN 16586-1:2017	Railway applications. Design for PRM use. Accessibility of persons with reduced mobility to rolling stock. Part 1: Steps for access and egress
BS EN 16586-2:2017	Railway applications. Design for PRM use. Accessibility of persons with reduced mobility to rolling stock. Part 2: Boarding aids
BS EN 16587:2017	Railway applications. Design for PRM use. Requirements on obstacle free routes for infrastructure
BS EN 16683:2015	Railway applications. Call for aid and communication device. Requirements
BS EN IEC 60268-16:2020	Sound system equipment. Objective rating of speech intelligibility by speech transmission index.
BS ISO 2813:2014	Paints and varnishes. Determination of gloss value.
BS ISO 3864-1:2011	Graphical symbols. Safety colours and safety signs. Part 1: Design principles for safety signs and safety markings.
BS ISO 7000:2019	Graphical symbols for use on equipment. Index and synopsis. See also http://www.iso.org/obp
BS ISO 7001:2023	Graphical symbols. Public information symbols.
BS ISO 9186-1:2014	Graphical Symbols. Test methods - method for testing
BS ISO 21542:2021	Accessible Building Construction
BS ISO 22727:2007	Graphical symbols. Creation and design of public information symbols. Requirements.
Design Standards for Accessible Railway Stations (DfT Code of Practice)	A joint Code of Practice by the Department for Transport and Transport Scotland, version 4, 20 March 2015
ERA/GUI/PRM TSI/2023	Guide for the application of the PRM TSI, version 2.0, based on the Commission implementing Regulation (EU) 2023/1694 of 10 August 2023
ETSI EN 301 462 (2000-3)	Human Factors; Symbols to identify telecommunications facilities for deaf and hard of hearing people. V.1.1.1

IC NTSN	Interoperability Constituent (IC) National Technical Specification Notice, published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011.
Inclusive mobility	Department for Transport document Inclusive Mobility: a guide to best practice on access to pedestrian and transport infrastructure. December 2021
INF NTSN	Infrastructure National Technical Specification Notice, published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Commission Regulation (EU) No 1299/2014 (INS TSI) and includes relevant amendments made by Commission Implementing Regulation (EU) 2019/776 which came into force in June 2019
KTR v7	Key Train Requirements version 7, available from the RSSB website.
LOC & PAS NTSN	Locomotive and Passenger National Technical Specification Notice, published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Commission Regulation (EU) 1302/2014 (the LOC & PAS TSI), and includes relevant amendments made by Commission Implementing Regulation (EU) 2019/776 which came into force in June 2019
PRM NTSN	Persons with Reduced Mobility National Technical Specification Notice, published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Commission Regulation (EU) No 1300/2014 (the PRM TSI), and includes relevant amendments made by Commission Implementing Regulation (EU) 2019/776 which came into force in June 2019
Railway (Interoperability) Regulations 2011 (RIR)	The Railways (Interoperability) Regulations 2011, Statutory Instrument 2011 No. 3066 (as amended)
Safety signs and signals	The Health and Safety (Safety Signs and Signals) Regulations 1996. Guidance on Regulations, L64 (Third edition), 2015