



Guidance on the Provision of Accessibility In Light Rail Systems


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GUIDANCE ON THE PROVISION OF ACCESSIBILITY IN LIGHT RAIL SYSTEMS

LRSSB - LRG 28.0

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DESCRIPTION:				
This document provides non-statutory guidance on providing accessibility to passengers across all areas of a Light Rail system.				
EXPLANATORY NOTE:				
LRSSB is not a regulatory body and compliance with this guidance document is not mandatory. This document reflects good practice and is advisory only. Users are recommended to evaluate this guidance against their own arrangements in a structured and systematic way, noting that parts of this guidance may not be appropriate to their operations. It is recommended that this process of evaluation and any subsequent decision to adopt (or not adopt) elements of this guidance should be documented. Compliance with any or all of the contents herein, is entirely at an organisation's own discretion.				
SOURCE / RELATED DOCUMENTS:				
LRG 1.0 Tramways and Principles Guidance (TPG) (LRSSB) LRG 8.0 Guidance in the Management of Vulnerable Persons (LRSSB) See also Appendix A				
RELATED TRAINING COURSES:			RELATED LEGISLATION:	
N/A			Health and Safety at Work Act etc. 1974 Management of Health and Safety at Work Regulations 1999 Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS)	
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TERMS AND ABBREVIATIONS

Table A – Terms

Term	Definition
CP Toilet	Changing Places Toilet: a fully inclusive and accessible toilet that has more space and specialist equipment, such as a height-adjustable bench and a ceiling hoist.
Danger Area	The part of the platform closest to the running lines, consisting of a tactile surface plus an additional width to allow passengers to stop once the tactile paving is detected.
Gateline	Ticket barrier at a train station.
Illuminance	Illuminance (Lux) is a measure of how much luminous flux (ie the light from a lamp) is spread over a given area. Thus, lux measures luminous flux per unit area.
Light Reflectance Value	Measurement (LRV) of how much light a colour reflects or absorbs.
National Key Scheme	Scheme offering disabled people independent access to locked public toilets around the country.
Platform Tram Interface	The ‘gap’ between the platform edge and the threshold of the Light Rail vehicle’s doorway.
Wayfindr	A non-profit organisation, aimed at creating a standards benchmark for digital wayfinding on mobile devices.

Table B – Abbreviations

Abbreviation	Definition
ATM	Automated Teller Machine
BS	British Standard
BS EN	British (BS) adoption of a European (EN) standard
CP	Changing Places
dB	Decibel
DFT	Department for Transport
Hz	Hertz
ITU	International Telecommunications Union
LED	Light Emitting Diode
LRV	Light Reflectance Value
Lux	The lux (symbol: lx) is the SI unit of illuminance.
mm	Millimetres
NKS	National Key Scheme
PA System	Public Address System
PRM	Person with Reduced Mobility
PTI	Platform Tram Interface
RADAR	Royal Association for Disability and Rehabilitation
RVAR	Rail Vehicle Accessibility (Non-Interoperable Rail Systems) Regulations, 2010
SLL	Society for Lights and Lighting
TC	Transport Scotland
WC	Water closet

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1. Introduction

- 1.1. This guidance supports the high level principles set out in LRG 1.0 Tramway Principles and Guidance (TPG) published by the Light Rail Safety and Standards Board (LRSSB).
- 1.2. This document provides guidance for those delegated this responsibility in relation to the factors of a Light Rail system so that it is accessible to facilitate independent travel for as many passengers as practicable. It relates to UK Light Rail systems (Tramways) based on 'line-of-sight' operations only. As with all guidance, this document is not prescriptive and is intended to give advice not to set a mandatory industry standard, and it is based upon goal setting principles as best practice.
- 1.3. Much of this guidance is based on the experience gained from existing UK Light Rail systems and from published documents. It does not prescribe particular arrangements adopted by any existing UK Light Rail system and is intended to give guidance and advice to those involved in the management of the provision of accessibility.
- 1.4. This guidance is not intended to be applied retrospectively to existing Light Rail systems. However, owners and operators should consider and assess any implementation of this guidance and / or any subsequent revision, to ensure continual improvement in reducing risks related to the provision of accessibility, so far as is reasonably practicable.

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2. Scope

- 2.1. This guidance takes into account the whole integrated journey from a passengers perspective. Although it is acknowledged that Light Rail networks have responsibility for insuring they have suitable and sufficient accessibly arrangements within the sphere of control and scope of operations, they should take into account areas of interface with other transport modes and the transition between them. Therefore certain sections within this document will refer aspects relating to the whole journey.
- 2.2. This document considers passenger accessibility requirements across a Light Rail system and includes the following:
- Accessible routes within the Light Rail system including to tramstops;
 - Within tramstops;
 - Facilities and information;
 - Boarding and alighting; and
 - Being on-board.
- 2.3. A key point of this document that it focusses on the needs of passengers. It, therefore, includes references to the most recent research or documentation where this has produced evidence that demonstrates that existing or previous guidance, standards or legislation do not go far enough to meet passenger accessibility needs.
- 2.4. However, the purpose of this document is also not – as a consequence – to prevent the delivery of extensions to existing tram systems, as it is recognised that existing infrastructure and Light Rail vehicles may not achieve the aims of these more recent developments. Thus, alternative and less stringent options will be provided in the cases where the more challenging requirements are listed.
- 2.5. This guidance document applies in full to the following:
- All new Light Rail systems;
 - All extensions to existing Light Rail systems, recognising that existing systems in their current form may not achieve all the most stringent requirements in this guidance, but would be compliant with the alternative requirements mentioned above. It may also be a necessity, for example, due to the performance of an existing tram fleet, that any new infrastructure on the extended part of the network may, similarly, only be able to meet the alternative requirements; and
 - All elements of an existing Light Rail system that are within the scope of an improvement, upgrade or modernisation programme. This again is subject to the caveat that certain, existant performance parameters may prevent the upgraded parts of the system from achieving the full requirements detailed in this guidance.
- 2.6. The scope of this document is to provide Light Rail systems including owners, operators as well as those who design Light Rail systems with guidance to provide accessibility across their system that facilitates independent travel for as many passengers as practicable. This includes defines the minimum accessibility requirements within stations and buildings, tramstops including platforms for those getting on and off trams and assessing the tramstop.

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2.7. This document also defines the minimum accessibility requirements that should be provided on existing Light Rail networks in cases where recent developments have led to the determination of more stringent accessibility requirements.

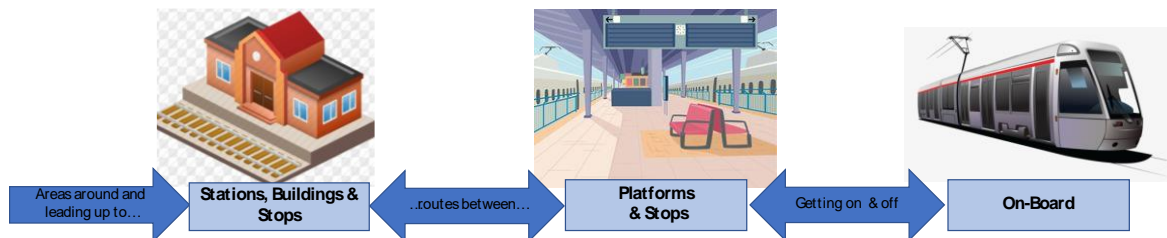
2.8. In reading this document, the following need to be borne in mind:

- Some disabilities are more identifiable and visible, some are not.;
- Some disabilities are permanent, some are temporary and others may present themselves more on certain occasions or under certain conditions and less on others;
- Some people may have more than one visible and / or non-visible disability; and
- Luggage, prams, buggies and small children can also restrict a persons mobility. This guidance also applies to these passengers although there are additional considerations and exceptions that can also be applied in these cases.

2.9. This document is divided into the following sections as represented by Figure 2.1:

- Tramstops, stations and buildings and other passenger areas;
- Boarding and Alighting; and
- On-board the Tram.

Figure 2.1: Layout of Guidance Document



2.10. This layout reflects a passenger’s logical progression from ‘Street to Seat’ and the emphasis that these accessibility requirements are based around meeting people’s needs when travelling to, on and from Light Rail networks.

2.11. Further information and guidance in relation to vulnerable persons travelling on a Light Rail system is provided in LRG 8.0 Guidance in the Management of Vulnerable Persons.

2.12. For the purposes of this document, a station is considered to be a building that has separate areas for circulation, including the purchase of tickets, gaining information, etc as well as for boarding the tram, possibly with multiple platforms.

2.13. Some tramstops may be within larger stations or buildings, for example inter-modal hubs or shopping malls and as such, there are passenger access routes to the tramstops (for example, accessible routes, information points, escalators, lifts, ticket facilities, etc) that may be outside of the Light Rail system’s ‘boundary’. In line with good practice, it is recommended that the Light Rail system engages with the owner and stakeholders of the stations and buildings to align accessibility requirements as practicable.

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3. Arriving at Tramstops, Stations and Buildings

Definitions and Applicability

- 3.1. This section encompasses the arrival at a tramstop, station or building that mark the starting and ending points of the 'Light Rail' part of a passenger's journey.

Arriving at Stations

- 3.2. This section covers all aspects of arriving at a station including car parking and the designation of car parking spaces, and set-down and pick-up points.
- 3.3. The requirements for the approach to a station, including car parking, set-down and pick-up are included within BS 8300 Part 1¹ with some additional guidance provided in 'Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure'² (DfT, 2021) and 'Design Standards for Accessible Railway Stations'³ (DfT and Transport for Scotland (TS), 2015).

Designated Accessible Car Parking Spaces

- 3.4. Where parking spaces are provided they should be located as close to the station entrance or accessible entrance as practicable and should be clearly signposted and marked.
- 3.5. If practicable, disabled persons' car parking spaces could be covered with a shelter to protect people with mobility difficulties from the elements while they transfer to or from their vehicles.

Off Street Parking

- 3.6. Within an off-street car park, a designated accessible parking space should be located on firm and level ground with no variation of surface profile exceeding ± 5 mm (for example, between paving, surface features or different surfaces). Each space should be a minimum of 4800 mm long and 2400 mm wide. An additional width of 1200 mm should also be allowed on all three accessible sides, so that a powered or manual wheelchair can be manoeuvred in or out of the vehicle. Where the spaces are perpendicular to the access aisle, this should be provided on each side, which may be shared with adjacent spaces. An additional zone of 1200 mm should be provided, at the vehicle access end of the space, to enable rear access.

Provision of Designated Car Parking Spaces

- 3.7. Where parking is provided, the minimum number of designated accessible spaces should be 5% of the total capacity for visiting disabled motorists. A further 5% of the total capacity should be enlarged standard spaces of 3600 mm wide x 6000 mm long that could be adapted to be designated accessible parking spaces to reflect changes in local population needs and allow for flexibility of provision in the future. It is

¹ BS 8300: Design of buildings and their approaches to meet the needs of disabled People – Part 1. External Environment – code of practice (2018)

² Inclusive Mobility. A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (publishing.service.gov.uk)

³ Design standards for accessible railway stations (publishing.service.gov.uk)

recommended that this additional 5% of the total capacity is maintained as enlarged spaces whenever changes to the number of designated accessible spaces are implemented as these can be prioritised for 'parent and child' usage.

- 3.8. Where there is available space, at least one large, designated parking space, 4800 mm wide x 8000 mm long, should be provided for side or rear access using hoists or ramps.

Electric Vehicles

- 3.9. Where charging points for electric vehicles are provided, equivalent provision should also be made for designated accessible spaces.

Signage and Information

- 3.10. Appropriate signage should be provided at the entrance to each car park and at each change in direction to direct motorists to the relevant designated accessible parking spaces.
- 3.11. Appropriate information should be clearly displayed on signage at the car park, such as the following:
- Conditions and requirements for parking, including height restrictions;
 - Payment terms, cost, payment methods;
 - Contact details for support, etc..

Entry and Exit Barriers

- 3.12. Ticket, swipe card or key-activated entrance barrier controls are often difficult to reach and operate by drivers with limited dexterity. Dual control systems, for example, those having barrier control panels at two different heights, can assist such people or remote control systems for regular users, etc.
- 3.13. Therefore, ticket, swipe-card or key-activated systems for car park barriers can be considered so they can be operated by the driver without leaving the car. If such systems are provided, no plinth should extend into the carriageway by more than 50 mm beyond a line taken vertically from the front face of the control panel.
- 3.14. Means of calling for assistance should be provided, for example an emergency telephone number displayed at the barrier or a call button located on the barrier control panel, etc.
- 3.15. People who are deaf or hard of hearing, need to be considered by, for example, the provision of a continuously monitored phone number as an alternative method of receiving a texted call for assistance or phone system at the security control point should be capable of receiving texts, etc.
- 3.16. The requirements for entryphones if used, are included within BS 8300 Part 2 (Section 8.5.2).

Payment Machines

- 3.17. Where car parking fees are required, an appropriately designed payment machine should be provided, conforming to BS EN 12414⁴. Payment machines should be located as close to the designated accessible parking space or spaces as practicable.
- 3.18. Payment machines should be easily identified and contrast visually with the background. Similarly, the operating buttons and controls should contrast visually with the background material of the machine.
- 3.19. The payment machine should be installed such that the height above ground of the controls, and of slots for coins or cards, should be at least 750 mm and not more than 1200 mm. The machine should be located as close to the designated spaces as practicable and on a route that is clear of obstructions, and in such a position as to allow clear access to it by a wheelchair user. The space in front of a meter or a ticket machine associated with a designated accessible parking space, or designated accessible parking spaces, should be level and free from obstruction.

Enforcement

- 3.20. It is recommended that the use of designated disabled persons' parking spaces is regularly monitored to limit misuse by non-disabled motorists and confirm the number of designated spaces remains appropriate for the car park.

Set-down / Pick-up Points

- 3.21. A designated set-down / pick up points should be suitable for use by disabled passengers and clearly identified. It is recommended that this setting-down point should be covered to provide protection from the weather. As such, set-down / pick up points should be provided on firm and level ground, close to the accessible entrance to the station. The location of the setting-down point should be clearly indicated.
- 3.22. Where the set-down / pick-up point is provided at a point where a highway crossing is required, a controlled crossing route should be provided.

If practicable, a short term waiting area for drivers of vehicles picking up disabled passengers or a disabled driver waiting for passengers should also be provided in addition to the setting-down point. *Design of the Set-down / Pick-up Point*

- 3.23. When designing a set down / pick up point, to assist the use by a disabled person, the surface of the footway, alongside a setting-down point, should be level with the carriageway at that point, to allow convenient transfer into and from a wheelchair.
- 3.24. A road-level set-down point should be near to a dropped kerb so wheelchair users may get onto the safety of the pavement quickly. Passengers should, as far as practicable, be dropped in a safety zone.
- 3.25. Where the set-down and pick-up point can only be at pavement level, the kerb alignment should, as far as practicable, allow vehicles to park hard against it, including a sufficient straight length of kerb.

⁴ BS EN 12414: Vehicle parking control equipment. Requirements and test methods for a parking terminal (2020)

- 3.26. If practicable, an area of the footway with a kerb should be assigned as a set-down / pick-up point for people using taxis and other vehicles that have ramps designed for transfer directly to the footway.
- 3.27. A set-down and pick-up point should be free of all obstacles and as wide as practicable to allow transfer to and from a wheelchair without being obstructed by other pedestrians. The width of the unobstructed footway should be sufficient to allow the deployment of wheelchair ramps (up to 1620 mm) and adequate manoeuvring space for the wheelchair user. The suggested total width is 4040 mm.
- 3.28. As wheelchair access to most taxis is on the nearside and through the rear door or the far side door. Where taxi ranks are provided, they should be designed to facilitate access without creating safety risks for either customers or drivers as far as practicable.
- 3.29. It is recommended that, where practicable, passengers are able to choose between getting out of taxis / minicabs or cars either at pavement level or at road level. Which of these is easier depends on the type of vehicle and the method of getting into and out of it.

Access Routes to and from the Station

- 3.30. Having arrived at the station, this section covers all aspects of routes in and out of a station or building from the street or car-park.
- 3.31. An obstacle-free access route should be provided to connect the accessible entrances with the car parking spaces and the set-down and pick-up point, and as far as practicable, to any interchange facilities provided by others. These routes shall be clearly indicated.
- 3.32. Where car parking and set-down / pick-up points are provided and are located outside the station area, all pavements between the station and the facility should comply with this guidance.
- 3.33. Station operators are encouraged to work with Local Highway and Planning Authorities to ensure that stations are clearly and consistently signposted at street junctions, especially on pedestrian routes between public transport facilities.

Access Route Dimensions

- 3.34. Obstacle-free routes are recommended to be at least 2000 mm wide to allow for wheelchair users or passengers with assistance dogs to pass each other, shall be level with a maximum gradient of 1:60 (1.7% or an angle of 0.95°), and with a maximum cross-fall of 2.5%. The width must be maintained up to a height of 2.5 m above ground level but if existing overhanging features fall below this 2.5 m limit, they should not protrude into the access route by more than 150 mm.
- 3.35. If it is necessary to narrow the route to avoid existing obstacles (for example, trees) the resulting restricted width should not be less than 1200 mm and should extend no more than 2000 mm.

Surfaces

- 3.36. Pavements should have a good level of slip resistance, with a smooth consistent texture and should have a well-defined kerb edge. Paving should have an even surface to reduce

trip hazards (for example, for people using mobility aids or with assistance dogs) and to avoid created a barrier for wheelchair users.

- 3.37. Where practicable, drainage gratings should be positioned outside the boundaries of the access route. Gratings within an access route should be set flush with the surrounding surface. Slots in gratings should not be more than 13 mm wide and should be set at right angles to the dominant line of travel. The diameter of circular holes in gratings should not be more than 18 mm.

Protection from Obstacles

- 3.38. Obstructions should be minimised. As far as practicable, free-standing columns that support an entrance canopy and any unnecessary street furniture should not be positioned within the width of an access route. Where practicable, other facilities should be grouped together and made to contrast appropriately with the background.
- 3.39. Where bollards are necessary to separate and protect pedestrian areas, they should be consistently spaced and away from the general lines of pedestrian travel. Bollards should be at least 1000 mm high and should contrast visually with the background against which they are seen. Bollards should have no horizontal projections; they may taper towards the top but should not taper towards the ground and should also incorporate a 150 mm deep contrasting strip at the top. Bollards should never be linked with a chain or rope.
- 3.40. It is recommended that bollards contain a light fitted with louvres (to direct the light downwards to prevent glare) if they are placed in areas that are dark at night.

Steps and Stairs, and Stairlifts and Lifting Platforms

- 3.41. Staircases on the obstacle-free routes should have a minimum width of 1600 mm measured between the handrails, and designed to be of sufficient width for current and predicted passenger flows under all anticipated circumstances as far as practicable, including normal and peak hour operations, perturbations and emergencies.
- 3.42. All floor coverings, ground surfaces and stair tread surfaces should be slip resistant and, if practicable, stepped access routes should be protected from inclement weather.
- 3.43. It is recommended that lighting levels increase to 150–200 lux over stairs and that the transition be smooth.
- 3.44. Staircases should be designed to be of sufficient width to accommodate appropriate predicted passenger flows in and around the during various operating scenarios including but not limited to normal, perturbed, and emergency escape situations. These scenarios should consider the needs of persons of reduced mobility. Further details on the requirements of staircases can be found in BS 8300 Part 1, Section 9.
- 3.45. Vertical lifting platforms should be provided for wheelchair users or other mobility aid users, with instructions that are clear and easily accessed, and fitted with an emergency alarm control device (a two-way voice communication system) in case users get into difficulty. Further requirements for lifting platforms are provided in BS 8300 Part 2⁵.

⁵ BS 8300: Design of buildings and their approaches to meet the needs of disabled People – Part 2. Buildings – code of practice (2018)

- 3.46. Wheelchair stairlifts should not be installed within the premises of new buildings. Wheelchair stairlifts outside existing buildings should be installed only where it is not practicable to install a vertical lifting platform or a suitable ramp. If provided, wheelchair stairlifts should conform to BS EN 81-40 and all other requirements should conform to BS 8300 Part 2.

Ramps and Gradients

- 3.47. Ramps shall be installed along a pedestrian route wherever there is a change of level and where lifts are not provided and should be clearly signposted and marked. However, some people with an ambulant mobility impairment have difficulty using a ramp and so this should not be the only option.
- 3.48. Ramps shall have a moderate gradient. A steep gradient (1:20 or steeper) is permitted for ramps on short distances only. This is specifically defined and listed in BS 8300 Part 1.

Widths

- 3.49. Ramps are required to be a minimum of 1500 mm wide. However, the determination of the most suitable ramp width for each particular application or location should include due consideration of current and predicted passenger flows under all circumstances, including normal and peak hour operations, perturbations and emergencies, together with the requirement for an 1800 mm minimum width that would permit two wheelchair users on a ramp to pass each other. Where the width between the handrails of a ramp exceeds 2500 mm, the ramp should be divided by a handrail into two or more equal channels to ensure that all users have access to a handrail.
- 3.50. Ramps shall be provided with handrails on both sides and at two levels. Handrail requirements are provided in BS 8300 Part 1.
- 3.51. A continuous upstand at least 100 mm high, or an equivalent barrier, should be provided at any open edge of a ramp. This should be detectable to long cane users and contrast visually with the surface of the ramp.

Landings

- 3.52. Landings, including any intermediate landings (along a series of ramps in a straight line) should be provided at the foot and head of a ramp. They should be at least the width of the ramp and a minimum of 1500 mm long, clear of any other obstruction.

Surfaces

- 3.53. Pavements should have a good level of slip resistance, with a smooth consistent texture and should have a well-defined kerb edge. Paving should have an even surface so that they do not present a trip hazard (for example, for people using mobility aids or with assistance dogs) and do not create a barrier for wheelchair users:
- 3.54. Where practicable, drainage gratings should be positioned outside the boundaries of the access route. Gratings within an access route should be set flush with the surrounding surface. Slots in gratings should not be more than 13 mm wide and should

be set at right angles to the dominant line of travel. The diameter of circular holes in gratings should not be more than 18 mm.

Protection from Obstacles

- 3.55. Obstructions should be minimised: free-standing columns that support an entrance canopy should not be positioned within the width of an access route, and any unnecessary street furniture (including temporary street furniture) removed, and the remaining facilities grouped together and made to contrast appropriately with the background.
- 3.56. Where bollards are necessary to separate and protect pedestrian areas, they should be consistently spaced and away from the general lines of pedestrian travel. Bollards should be at least 1000 mm high and should contrast visually with the background against which they are seen. Bollards should have no horizontal projections; they may taper towards the top but should not taper towards the ground and should also incorporate a 150 mm deep contrasting strip at the top. Bollards should never be linked with a chain or rope.
- 3.57. It is recommended that bollards contain a light fitted with louvres (to direct the light downwards to prevent glare) if they are placed in areas that are dark at night.

Steps and Stairs, and Stairlifts and Lifting Platforms

- 3.58. Staircases on the obstacle-free routes shall have a minimum width of 1600 mm measured between the handrails, but should be designed to be of sufficient width to deal with current and predicted passenger flows under all circumstances, including normal and peak hour operations, perturbations and emergencies.
- 3.59. All floor coverings, ground surfaces and stair tread surfaces shall be slip resistant and, if practicable, stepped access routes should be protected from inclement weather.
- 3.60. It is recommended that lighting levels increase to 150–200 lux over stairs and that the transition should be smooth.
- 3.61. Staircases should be designed using best practice principles to be of sufficient width to deal with current and predicted passenger flows in and around the station during various operating scenarios including but not limited to normal, perturbed, and emergency escape situations. These scenarios should take into account the needs of persons of reduced mobility. Further details on the requirements of staircases can be found in BS 8300 Part 1, Section 9.
- 3.62. Vertical lifting platforms should be provided for wheelchair users or other mobility aid users, with instructions that are clear and easily accessed, and fitted with an emergency alarm control device (a two-way voice communication system) in case users get into difficulty. Further requirements for lifting platforms are provided in BS 8300 Part 2.
- 3.63. Wheelchair stairlifts should not be installed within the premises of new buildings. Wheelchair stairlifts outside existing buildings should be installed only where it is not practicable to install a vertical lifting platform or a suitable ramp. Wheelchair stairlifts should conform to BS EN 81-40 and all other requirements should conform to BS 8300 Part 2.

Ramps and Gradients

- 3.64. Ramps shall be installed along a pedestrian route wherever there is a change of level and where lifts are not provided and should be clearly signposted and marked. However, some people with an ambulant mobility impairment have difficulty using a ramp and so this should not be the only option.
- 3.65. Ramps shall have a moderate gradient. A steep gradient (1:20 or steeper) is allowed for ramps on short distances only. This is specifically defined and listed in BS 8300 Part 1.

Widths

- 3.66. Ramps are required to be a minimum of 1500 mm wide. However, the determination of the most suitable ramp width for each particular application or location should include due consideration of current and predicted passenger flows under all circumstances, including normal and peak hour operations, perturbations and emergencies, together with the requirement for an 1800 mm minimum width that would permit two wheelchair users on a ramp to pass each other. Where the width between the handrails of a ramp exceeds 2500 mm, the ramp should be divided by a handrail into two or more equal channels to ensure that all users have access to a handrail.
- 3.67. Ramps shall be provided with handrails on both sides and at two levels. Handrail requirements are provided in BS 8300 Part 1.
- 3.68. A continuous upstand at least 100 mm high, or an equivalent barrier, should be provided at any open edge of a ramp. This should be detectable to long cane users and contrast visually with the surface of the ramp.

Landings

- 3.69. Landings, including any intermediate landings (along a series of ramps in a straight line) should be provided at the foot and head of a ramp. They should be at least the width of the ramp and a minimum of 1500 mm long, clear of any other obstruction.

Surfaces

- 3.70. The surface materials used for a ramp should be chosen to be as easy to maintain and as slip resistant as practicable, especially in wet weather or where spillage occurs. Where different materials are used for the flights and the landings of a ramp, care should be taken to ensure that the slip characteristics are similar in order to minimise the risk of stumbling. If required for drainage of surface water, the maximum cross-fall gradient of a slope should be 1:50.
- 3.71. The surface of a ramp should contrast visually with that of a level landing, so that its presence is detectable by visually impaired persons.

Lighting

- 3.72. Lighting outside a station shall be sufficient to enable way-finding and to highlight changes of level, doors and entrances. It should be noted that white light is more effective than yellow light in creating true colour appearances. Care should be taken to

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minimise glare and reflections which may cause confusion. Requirements for station forecourt lighting are provided in BS 5489 Part 1⁶.

Access Routes to a Tramstop

- 3.73. An accessible route to a tramstop should consider the same elements for an accessible route in or out of a station, as described in Section 3.30-3.72 for a station.
- 3.74. The dimensions, surfaces, cross-falls and gradients are subject to the same conditions as for an accessible route, including the requirements to be obstacle-free, signposted, well-lit and of sufficient width to permit wheelchair users or passengers with assistance dogs to pass each other.
- 3.75. Where the route to a tramstop is required to cross the track, the top of the rail should be set flush with the surrounding surfaces to minimise the tripping hazard and the residual gap required for the tram wheels is to be maintained to be as small as practicable whilst still permitting normal running of the tram.
- 3.76. Road crossings that are associated with, and adjacent to, a tramstop should be clearly indicated. Where practicable, controlled road crossings (pelican crossings) should be phased and sufficient time allowed so that passengers may cross and board a tram before movement authority is given for departure.

⁶ BS 5489-1: Design of road lighting. Part 1 Lighting of roads and public amenity areas. Code of practice (2020)

4. Within Tramstops, Stations and Buildings

- 4.1. This section encompasses the experience at a tramstop, station or building that is part of the starting and ending points of the 'Light Rail' part of a passenger's journey.

Within the Station or Tramstop

- 4.2. This section provides accessible guidance for passengers moving within a station or at a tramstop. As appropriate to each location, this includes the following:
- Entrances and doorways;
 - Horizontal and vertical circulation;
 - Perception and communication;
 - Facilities provided; and
 - Toilets.

Entrances and Doorways

- 4.3. All station entrances should be suitably designed to avoid becoming a barrier to access. An entrance without a doorway fitted should conform to the minimum width of an access way and should be 2000 mm wide.
- 4.4. Where doorways are fitted, the door is recommended to be at least 1000 mm wide, and should have a clear space of 2000 mm before and after it to allow a wheelchair user the necessary space to manoeuvre.
- 4.5. The full list of requirements for entrances and doorways are specified in BS 8300 and include the following factors:

Visibility and Contrast

- 4.6. Entrances and doorways should contrast visually with the immediate surroundings, should be well-lit and clearly signed. They should provide a clear view of the interior of the building.

Weather Protection

- 4.7. The entrance should incorporate a canopy or other form of weather protection. No part of the structure of this protection should present an obstruction to people with a visual impairment.

Threshold

- 4.8. Thresholds at an entrance or doorway should be level. Entrances and external doorway should also be suitably designed to permit water dispersal through gradients or drainage, subject to permitted slopes and drainage hole sizes.
- 4.9. Existing raised thresholds should be no more than a cumulative height of 15 mm, with exposed edges of any upstand greater than 5 mm high either chamfered or pencil-rounded.

Manual Doors

- 4.10. Doorways should be usable by those with disabilities. For simplicity, ease of customer use and consistency, doors should be power-operated. However, where power-operated doors are not practicable or for existing manual doors, door opening furniture should be operable with one hand and should be within easy reach, and the force required to open the door should be manageable by a wheelchair user or person with limited strength.
- 4.11. Doorknobs should be avoided and lever handles should be used in all situations. The door opening fittings should contrast with the door and with the surroundings to ensure they are easily visible.
- 4.12. For ease of use, and subject to the other requirements for visibility, contrast and hazard protection, manual doors should be held open during working hours.

Power-operated Doors

- 4.13. Where practicable, doors should be power-operated with either a manual or an automatic system. They should be installed on a flat, level accessway as ramped floors leading down to power-operated doors are a potential hazard. Clear warnings signs should be provided and the swing of the doors should be protected from the main pedestrian flow by setting them into a recess or by providing guarding rails.
- 4.14. Manually activated power-operated doors should have push-button controls located at a height between 750 mm and 1000 mm from the floor. To prevent the controls becoming a safety hazard the controls should be installed as close to the door as practicable and contrast visually with the surrounding background. Where practicable, additional activation controls should be provided at a lower height that can be operated by the footrest of a wheelchair for people with limited upper body strength.
- 4.15. Automatically activated doors should be controlled by a proximity or motion sensor, which should be installed so that it is not inadvertently activated by passers-by. Warning signs clearly indicating the direction of opening should be provided on the approach to the doors. When doors open towards the approach, they should open early enough and stay open long enough to ensure a safe entry or exit. Automatically activated doors should also be operable in a manual mode in the event of a power failure.

Horizontal Circulation

- 4.16. Station buildings should be designed to facilitate convenient orientation and intuitive way-finding. A way-finding strategy should be part of the inclusive design strategy of the building. Way-finding should employ spatial, physical and environmental elements to help people plan and navigate their movements. These elements include architectural clarity and layout, graphic communication and signage, tactile communication, audible or visual communication, and personal navigation systems.
- 4.17. Increasingly, technological solutions are being developed to help navigation through public transport facilities. Way-finding solutions should provide both static information (for example, location of ticket offices or toilets) and dynamic information (for example, real-time tram departure times or service status updates).

- 4.18. The 'Wayfindr' open standard⁷ has been adopted as best practice for audio-based navigation systems and has been adopted by the International Telecommunications Union (ITU). Systems should consider the requirements of the open standard and the needs of users when developing the way-finding strategy of the tramstop or system.

Entrance and Reception Areas

- 4.19. Entrances should be provided with a means to ensure water and debris can be removed from shoes and wheelchair wheels, in accordance with BS 7953⁸. Floor surfaces should be firm and slip-resistant and should be free from obstructions.
- 4.20. Stations should provide directional information close to the entrance point or points to indicate the facilities provided and their location, enabling passengers to orient themselves as quickly and easily as practicable. Information points, passenger assistance points and other key locations should be prominently indicated.

Moving Around

- 4.21. Accessible routes that are obstacle-free and step-free shall be provided to connect all public areas within a station building. Routes should be at least 2000 mm wide to enable wheelchair users to use them easily, as recommended in DfT / TS's Code Of Practice for design standards.
- 4.22. For existing stations, it is permitted to provide a width of 1800 mm or a width of 1200 mm provided that passing spaces of 1800 mm are also provided (BS 8300 Part 2).
- 4.23. Thresholds on the accessible route shall be no more than 15 mm high and any height increase of more than 5 mm shall have rounded or bevelled edges. In existing buildings, where accessible routes differ from other routes (for example, those with stepped changes of level), these should be clearly identified and signposted. Accessible routes shall have tactile and contrasting walking surfaces to assist visually impaired people. Any handrails or walls within reach of the accessible route shall have brief direction or location information in Braille or prismatic letters.
- 4.24. Station furniture, bollards and other facilities such as seating, telephones, vending machines and free-standing signs should be sited outside of the main passenger flow. Lights and signs should be mounted on the walls or suspended to avoid additional upstands. Columns, poles and other features that cannot be sited away from the main access route should be marked with a coloured band 140-160 mm wide with the lower edge 1500 mm above the ground.
- 4.25. Objects projecting more than 100 mm into the access route between 300 mm and 2100 mm above the ground should be bordered by a hazard protection barrier at 1000 mm above the ground and a kerb detectable by a long cane user. Litter bins should be placed so as not to be an obstruction. The top should be 1300 mm above the ground with the opening recommended to be 750-900 mm above the ground. They should visually contrast with the background against which they are placed.
- 4.26. Tapering obstructions, such as the space under stairs and ramps should be blocked in or protected by rail at a height at least 1000 mm above the ground.

⁷ Wayfindr Open Standard Recommendation 2.0 – <https://www.wayfindr.net/open-standard>

⁸ BS 7953: Entrance flooring systems – selection, installation and maintenance (1999)

Seating

- 4.27. Seating should be provided in all public areas of a station, the number of seats provided should be proportionate to the passenger numbers and the average waiting time. All seating should be clean and comfortable and easy to use in terms of manoeuvrability. Armrests should be coated and slip-resistant.
- 4.28. Priority seating should be clearly marked as for use by disabled people, older people, pregnant women and those carrying young children, and should be located near to entrances, travel information, toilets and other facilities. Where there is limited seating offered it should all be marked as for priority use.
- 4.29. If a significant number of seats are provided, 50% of the seating should provide accessible features including the following:
- Different seat heights;
 - With or without armrests or back rests;
 - Space at the side to allow transfer from a wheelchair or for a wheelchair user to sit next to a companion; and
 - Enough space under or adjacent to these seats to allow an assistant dog to lie clear of the main passenger route.
- 4.30. The recommended ratio of spaces for wheelchairs to fixed seats is as per the Table 3.1 below.

Table 3.1 Recommended Ratio for Wheelchairs to Fixed Seats

Fixed seating capacity	Number of wheelchair spaces
4 to 25	1
26 to 50	2
51 to 200	4

- 4.31. Requirements for seating within general waiting areas are provided in BS 8300 Part 2.
- 4.32. To provide rest-points for people with mobility impairments, it is recommended that seating should be provided at least every 50 metres along a step-free access way. As with other potential obstructions, this should be positioned so that they do not obstruct the main passenger flow, be detectable by a person using a long cane and contrast visually with the background.

Lighting

- 4.33. Internal lighting should be used to boost natural light sources, which should be maximised in all new designed station facilities. Lighting levels should be good and consistent at all times of day, with no sudden difference in lighting levels. There should be excessively bright or dark areas, and lighting transitions should be smooth.
- 4.34. White light is better than yellow light in terms of providing a true colour appearance and the lighting provided should be appropriate to the visual task required of the passenger. Areas requiring particular attention to the lighting provision include the following:

- Changes of level;
- Inside passenger lifts;
- On and around escalators;
- At ticket offices and machines;
- At information desks; and
- At information displays.

Ticket Barriers and Gatelines

- 4.35. An accessible route should be provided as an alternative to any gateline or ticket barrier system. This accessible route should have a minimum free passageway width of 900 mm and capable of accommodating a wheelchair of up to 1250 mm in length. This accessible route may be automatically operated or staff-operated. At times when stations are open but unstaffed, ticket barriers and gates should be fixed in an open position.
- 4.36. If turnstiles are used, a non-turnstile access route should be provided for use by persons of reduced mobility at all operational times.
- 4.37. Ticket or coin slots should be designed to be clearly visible and easy to use by passengers who are visually impaired or have limited manual dexterity.
- 4.38. Paddles on automatic ticket gates should contrast with the remainder of the gate and should be designed so as not to cause injury during their operation.

Vertical Circulation

- 4.39. Accessible movement between floors may be fulfilled using a combination of lifts, ramps, stairs and escalators. Finding and using these facilities should be as easy and convenient as horizontal circulation and should be an integrated part of the way-finding strategy of the buildings.

Steps and Stairs

- 4.40. The following guidance applies to steps and stairs:
- A flight of steps or stairs should have uniform riser and tread dimensions. A series of flights should have the same uniform dimensions and a uniform number of steps in each;
 - The rise of each step in a flight of stairs should be between 150 mm and 180 mm. This is to reduce the strain on hips and knees for people with ambulant mobility difficulties;
 - The tread depth of a step should be between 300 mm and 450 mm. This is to reduce the risk of a slip or an overstep, particularly when descending;
 - To reduce the risk of tripping, steps should not overlap the one below;
 - The width of a flight of stairs should not be less than 1600 mm between handrails. If the width between handrails exceeds 4000 mm an additional central handrail should be provided;
 - Steps and stairs should have a full width, durable, contrasting material strip to enable visually impaired users to appreciate the extent of the stair and to identify the individual treads. The stairs should have a slip-resistant surface;

- A level landing should be provided at the top and bottom of each flight of stairs
- Lighting should be provided along each flight of stairs and landings to ensure clear distinction between every step and riser. Lighting that causes glare and reflections should be avoided;
- A single step should be avoided as this is a trip hazard. If there is a need to increase the floor height by the height of one riser, the increase should be incorporated within a ramp;
- Refuges should be provided to afford a place of relative safety for people whose impairment might result in their delayed evacuation from the station in an emergency. A refuge should enable wheelchair users to manoeuvre and to access the refuge independently. Emergency voice communication controls should be fully accessible within the refuge; and
- Requirements for internal steps and stairs are provided in BS 8300 Part 2.

Ramps and Slopes

- 4.41. Stations should be designed to avoid ramps or slopes on internal circulation routes. Where this is unavoidable, ramps should be shallow, have minimal cross-fall and should have landings at the top and bottom and every 500 mm rise.
- 4.42. If a ramp forms part of an obstacle-free route to the platform, the handrails shall have brief information (for example, platform number or direction information) in braille or in prismatic letters or numbers for visually impaired passengers.
- 4.43. All other requirements for ramps within a station premises have been included previously in Section 3.47 to 3.54.

Handrails

- 4.44. The following guidance applies to handrails:
- Stairs and ramps shall be provided with handrails on both sides and at two levels;
 - The top surface of the handrail should be between 900 mm and 1000 mm from the surface of the ramp or pitch line of a stair and between 900 mm and 1100 mm from the surface of the landing. The second handrail should be installed with its top surface 600 mm from the ramp surface or pitch line;
 - An additional handrail should be installed on stairways wider than 400 mm. This should consist of double rails to avoid clashes between users on different sides;
 - Handrails should have a slip-resistant, coated finish to provide insulation for people with painful hand conditions, and provide contrast for visually impaired users; and
 - Requirements for handrails are found in BS 8300 Part 2.

Lifts

- 4.45. Lifts shall be provided where ramps are not available and should be located as near as practicable to any stairs. Lifts should be grouped together to reduce waiting times.
- 4.46. Where space allows, the recommended minimum internal dimensions of a lift should be 1600 mm wide, 1500 mm deep and 2300 mm high. Lift doors should provide a clear opening of at least 900 mm

- 4.47. Through lifts have a door at either end of the lift and should be installed wherever the geography of the station allows. This arrangement is much easier for wheelchair users, who do not have to turn round in the lift or reverse out of it, a manoeuvre which can be both difficult and time consuming.

Escalators

- 4.48. Escalators should not be used as a substitute for stairs and lifts as they cannot be used by wheelchair users, assistance dog users and people who lack the confidence to use them. Where escalators are provided, stairs and lifts should be located nearby and clearly signposted for those who have difficulty using escalators.
- 4.49. If no alternative to the escalator is available, staff should be available to assist and turn off escalators even during peak periods to allow a passenger to use the escalator as a static stairway.
- 4.50. The direction in which an escalator is travelling should be clearly indicated by a sign.

Dimensions

- 4.51. The recommended angle of inclination for escalators is 30 to 35 degrees. The recommended width for escalators is between 580 mm and 1100 mm.
- 4.52. The recommended height for escalator steps is between 210 mm and 240 mm, if escalators are to be used as an emergency exit when stationary, and the recommended preferred tread depths are 380 mm.

Lighting, Visibility and Contrast

- 4.53. The following guidance applies to lighting, visibility and contrast:
- Escalator steps should have a nosing that contrasts visually with the tread and riser;
 - Escalator handrails should contrast visually with the surroundings for the benefit of visually impaired persons. The handrails should have discs (minimum 18 mm diameter, equally spaced at 1000 mm and centred) which are colour contrasted to indicate that the handrails are moving;
 - Lighting levels on escalators are recommended to be increased to 150–200 lux, but that the transition should be smooth;
 - The sides of the escalator should be in a non-reflective material; and
 - Emergency stop buttons should be clearly marked. It is important that people with limited dexterity can use them.

Landings and Approaches

- 4.54. There should be enough space at the top and bottom to give passengers enough room to get on and off safely. Five metres or more is recommended where reasonably practicable.
- 4.55. The approaches to the top and bottom of escalators should be indicated by a change of floor colour using a slip-resistant ridged standard plate.

- 4.56. Where it is practicable to approach the escalator or travelator obliquely, barriers should extend 1500 mm in front of the escalator to aid visually impaired people.

Perception and Communication

- 4.57. This section considers the additional factors and elements that contribute to independent accessible journeys and enhance the passenger experience within the station.
- 4.58. It is important to consider that good communication is inherently dependent upon perception, i.e. a message (which must be clear and consistent in itself) must be received in order for it to be processed and understood. Station premises are required to facilitate this to achieve maximum accessibility.

Lighting

- 4.59. Good lighting is crucial in ensuring that partially sighted people and people with sensory / neurological processing difficulties are able to use buildings conveniently and safely. The following are key factors to be considered:
- Illuminance on interior surfaces;
 - The quality of the lighting;
 - Good colour rendering; and
 - The avoidance of glare.
- 4.60. The reflectance of walls, floors and ceilings influences the flow of light within a room or space. This affects the view of objects within the space and also the appearance of the human face. People who are deaf and hard of hearing need to see and understand the movement of lips for lip reading, and hands when signing. Where one-to-one communication is important it should be ensured that the lighting illuminates the face of the person speaking to make it easier for a person lip-reading.
- 4.61. Artificial lighting systems should be designed to maintain a level of illumination that is suitable for people who are blind or partially sighted and is compatible with electronic and radio frequency installations. Where artificial lighting is provided, it should be designed as to avoid any perception of flicker.

Glare and Shadows

- 4.62. Glare from bright patches of light within the field of view can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory / neurological processing difficulties.
- 4.63. Both natural and artificial sources of lighting should be designed to avoid creating glare, pools of bright light and strong shadows, and achieve the preferred even illuminance across a room.

Colour Rendering

- 4.64. Artificial lighting should give good colour rendering of all surfaces. The colour rendering of surfaces can be enhanced by the correct choice of lamp as indicated in the SLL

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(Society of Light and Lighting) code for lighting⁹. Note also that use of strong colours, either in light sources or on surfaces can lead to sensory overload for some people with sensory / neurological processing difficulties.

Surface Finishes

- 4.65. Floor, wall, door and ceiling surfaces can benefit or may actively disadvantage some people in their use of stations. Requirements for Surface Finishes can be found in BS 8300 Part 2.

Visual Characteristics

- 4.66. Reflections and glare from mirrored, high-gloss and other shiny surfaces can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory / neurological processing difficulties. Glare and reflections also make it more difficult for people to lip read.
- 4.67. The contrast between the floor and the wall is critical for way-finding as most people concentrate their vision below 1200 mm from the floor. This should, therefore, be considered when determining the strategy for the provision of information, seating and other facilities.
- 4.68. Around 5% of the population is colour-blind, particularly in the red/green region, and this needs to be taken into account when selecting colour schemes.
- 4.69. Methods of measuring and differentiating light reflectance values (LRVs) are provided in Annex B of BS 8300 Part 2. Differences in LRV should be used to assess the degree of visual contrast between surfaces such as floors, walls, doors and ceilings and between key fittings and the surrounding surfaces. The LRV of a wall should be 30 points different from that of the ceiling and of the floor.

Materials and Acoustic Design

- 4.70. Hard materials used for ceilings, walls and floors, reflect sound and create a noisy environment. This may cause difficulty for a person who is deaf or hard of hearing in understanding what is being said. Similarly, a person who is blind or partially sighted, may rely on the character and quality of reflected sounds and might become confused because of extended reverberation times or an echo effect. People with sensory / neurological processing difficulties can experience sensory overload within environments that are noisy and too reverberant.
- 4.71. Materials for ceilings, walls and floors should contribute to a welcoming and beneficial acoustic environment that helps orientation and enables audible information to be clearly heard.
- 4.72. Recommendations for acoustic design are given in BS 8233.
- Floor Surfaces*
- 4.73. People with sensory / neurological processing difficulties can find shiny surfaces and some patterns difficult.

⁹ The SLL Code for Lighting (Society for Lights and Lighting, CIBSE, 2012): [CIBSE - Building Services Knowledge](#) Note this guide is under review

4.74. The following guidance applies to floor surfaces:

- Bold patterns or strong visual contrast can cause confusion and may be perceived as a change in level or a void. This can lead to anxiety or hesitancy in movement, leading to falls;
- Very shiny finishes should be avoided due to problems with glare and the fact that they are perceived as being slippery even when they have a slip-resistant surface;
- Large, repeating patterns that incorporate bold contrasting colours or simulate steps should not be used for any floor surface;
- Floor surfaces should offer a level of slip resistance that provides a firm foothold and good wheel grip under normal conditions of use. Adjacent floor surfaces should have similar levels of slip resistance;
- The ingress of soil and surface moisture to buildings, or their transfer between adjacent internal areas, should be reduced to the lowest practicable level; and
- Guidance on slip resistance is given in Annex C of BS 8300 Part 2.

Wall Surfaces

- 4.75. People who are deaf and hard of hearing, and who lip read, might be distracted by patterned wall surfaces or screens located behind counters, reception points and similar spaces.
- 4.76. People who have sensory/neurological processing difficulties and people who are blind or partially sighted, might be confused by bold patterns on walls as they distort the perception of distance.
- 4.77. People with photosensitive epilepsy may be sensitive to some patterns, like stripes or checks. Patterns that create a flicker rate of between 3 Hz and 60 Hz should be avoided as these can trigger seizures.
- 4.78. Large, repeating patterns that incorporate bold, contrasting colours should not be used for the wall surfaces within stations. This should be considered for temporary wall coverings, such as information or promotional posters, videos, etc as well as for permanent installations.

Glazed Walls and Screens

- 4.79. Glazed screens should conform to BS 6262¹⁰. They can give the illusion that there is unimpeded access at these points. This can be hazardous and confusing for people who are blind or partially sighted. The surface of glazed walls and screens should be clearly highlighted with a design that provides a visual contrast with the surface behind it under both natural and artificial lighting conditions, and from all likely viewing angles.
- 4.80. This design is likely to take the form of a continuous or broken line, sign, logo or patterning on the glass. It should be located within two zones, from 850 mm to 1000 mm from the floor and from 1400 mm to 1600 mm from the floor, and should cover at least 10% of the glazing area within each zone.

¹⁰ BS 6262-4: Glazing for buildings Part 4 Code of practice for safety related to human impact (2018)

- 4.81. Glazed screens at counters and reception points should be constructed from glass with a low light reflectance and located such that they do not affect the ability of people who are deaf and hard of hearing to lip read through them. Glass that is silvered or highly reflective should be avoided.

Signs and Information

- 4.82. Clear information is required if people are to maintain a clear sense of direction and independent use of the station.
- 4.83. Visual and tactile forms of information are often used in combination, complemented by audible information, as no single medium can communicate information to all those who need to receive it. It is required that operational rules ensure consistency of messages between visual and audible information.
- 4.84. As a minimum, the information provided shall be safety and warnings, service departures, and the identification of station facilities (where provided) and the access routes to them.
- 4.85. The effectiveness of information is determined by:
- Location, accessibility, layout and height of signs;
 - Size and case of lettering, the size of symbols and reading distances;
 - Use of tactile letters and symbols;
 - Visual contrast and lighting;
 - Finished surfaces of materials used for signs and symbols;
 - Simultaneous use of audible and visible cues; and
 - Integration with any other communication systems.
- 4.86. Requirements and further guidance for Signs and Information are provided in BS 8300 Part 2.

Signs

- 4.87. Signs should form part of an integrated and consistent communication and way-finding scheme, identifying services, facilities and platforms, and giving clear directions, information and instructions to passengers.
- 4.88. Key location and directional information, for example maps, plans and orientation signs should be placed at key locations, such as entrances, junctions, landings and doorways. They should be both visual and tactile where low enough to be touched. Audible information should also be provided. An assistive listening system should be installed throughout the station building.
- 4.89. Directional signs should clearly identify the route to a destination, accessible routes, including emergency and escape routes. Potential points of uncertainty, for example junctions, should be carefully considered. It is essential to ensure signs to a facility or feature continue to appear until the destination is reached. Ramps, steps, lifts and escalators should be clearly indicated at both ends of the route.

Visual Signs

- 4.90. Visual signs should be mounted or placed within – or as close as practicable to – the main field of vision but, equally, not so that they impeded or obstruct passenger flow. It is recommended that they are placed between 1400 mm and 1700 mm above the floor level. Some signs – particularly safety notices – should be duplicated at lower levels so they can be read equally by a standing person or a wheelchair user.
- 4.91. Signs should not be installed on a door that may be held open but placed on the wall next to it. Overhead or projecting signs should be placed such that there is at least 2500 mm clearance from the underside of the sign to the ground. Where signs also contain a control panel they should be installed between 900 mm and 1200 mm above the ground to ensure they are within easy reach of a wheelchair user.
- 4.92. All signs should be well lit at all times, whether illuminated by daylight or artificial lighting or are internally lit, but should not be subject to glare, shadow, or reflections.
- 4.93. Visual signs should use simple words, clearly separated from one another and in short sentences. Abbreviations and very long words should be avoided as should text comprising block capitals only. Universally recognised signs and symbols should be incorporated, including universally accepted colour coding (i.e. red for danger or emergency, green for safety, etc). Symbols and pictograms should be used to supplement text, not to replace it. Tactile information should also be included to assist people who are blind or partially sighted.
- 4.94. The universally accepted ‘wheelchair’ symbol should be included with information on wheelchair specific routes, wheelchair-accessible toilets and other amenities, and indication of the tram wheelchair boarding point (if required). The universally accepted ‘hearing induction loop’ symbol should be used where these facilities are fitted.
- 4.95. Recommended character heights can be calculated by the following formula:

$$\frac{\text{Reading distance (mm)}}{100} = \text{Character height (mm)}$$

- 4.96. Letters, symbols and pictograms should contrast visually with the signboard and signboards should contrast visually with their backgrounds. Signs with light coloured text, symbols or pictograms on a dark background are preferred: an LRV difference of 70 points is recommended for sufficient visual contrast in these cases.
- 4.97. Tactile and Braille signs and symbols should be used in addition to other signage. Well-contrasted embossed letters and symbols should be used to assist both sighted and blind or partially sighted people. Tactile signs should be complemented by audible information to provide further assistance.

Display Screens

- 4.98. The following guidance applies to display screens:
- Display screens shall be sized to show complete individual words or messages. Messages should be accurate, up-to-date and non-conflicting with any other information provided in any other form.

- Systems that give changing information should allow sufficient time for the information to be read, digest and understood before it changes. The time allowed should consider people with visual impairment and/or cognitive impairments who may take longer to read and understand the information presented. Messages are easier to read when refreshed rather than scrolled.
- Mounted display screens are particularly vulnerable to reflections and glare. Careful placing of screens is required to ensure readability from all angles.
- It is recommended that low-level screens are also provided to assist wheelchair users and others who find it difficult or uncomfortable to look up for long periods of time.
- Where LED or dot-matrix displays are used, a clean letter shape should be established, preferably using a 32-dot display to ensure a clearer text.
- This legibility guidance applies equally to electronic, plasma-screen or dot-matrix signs.

Audible Communication

4.99. The following guidance applies to audible communication:

- Public address systems should be clearly audible and intelligible and should be supplemented by visual information. Operating rules and procedures should ensure that there is never any inconsistency or conflict of messaging;
- It is essential that there is a significant difference between the background or ambient noise and the announcement. It is recommended this difference is at least +5dB. To achieve this, loud-speakers should be placed frequently throughout the station to reach all public areas, rather than relying purely on high volume. High volumes can cause pain and disorientation to some users;
- Clear departure announcements should be given as they are particularly valuable for blind and partially sighted passengers and are a reassurance to all;
- Announcements should give priority to covering any variations from the normal timetable (emergencies, revised platforms, cancellations or late running). Information about the probable length of any delay should be included where this is known;
- Stations should provide an assistive listening system, typically an Induction Loop system, that is linked to the PA systems and covers ticket counters, help points, information points and other areas of the station as appropriate. Induction loop system performance requirements are provided in BS EN 60118-4¹¹. Induction loops should be clearly signposted; and
- Future assistive listening systems, for example via Wi-Fi and an app, may be provided in addition to an established assistive listening system if the performance and customer experience is comparable or better.

Fire and Emergency Alarms

4.100. The following guidance applies to audible communication:

- Emergency alarms should be both visual and aural;

¹¹ BS EN IEC 60118-4: Electroacoustics. Hearing aids Part 4 Induction-loop systems for hearing aid purposes. System performance requirements (2015 and 2018)

- Visual announcements can be displayed on departure screens. Any visual alarm should be positioned so that it does not interfere with the ability of tram drivers to see and act on signals and signs;
- Aural emergency alarms should be played as distinct and different from all other aural signals in the station;
- Flashing alarms can be helpful but they should not be set so that the frequency of the strobe causes confusion, disorientation or epileptic seizures; and
- Requirements for fire alarm systems are provided in BS 5839 Part 1¹².

Facilities Provided within a Station or at a Tramstop

4.101. All facilities provided within a station should be designed, operated and maintained to consider all passengers.

Help Points

4.102. Help points should be provided at key points at a station or tramstop, such as on concourses or platforms. They should not be located so that they impede or obstruct the main passenger flow. They should be clearly marked and designed so that visually impaired people can easily find, recognise and use them. They should contrast visually against their background.

4.103. The controls and the speaking and listening parts of the Help Points should be located between 700 mm and 1200 mm above the ground. All buttons and controls on the Help Point should contrast against the body of the device. Minimal force should be required to operate the controls and they should be a minimum of 20 mm in diameter so that they are palm-operable.

4.104. It is essential that local acoustic conditions are considered so that the person providing the help can be heard. Help points should be fitted with an induction loop and a visual indicator lamp should inform a hearing impaired person that their call has been answered.

4.105. Operators must have in place a mechanism to allow passengers to inform them when there are problems, particularly at unstaffed stations. Staff should be available to answer calls at all times that services are in operation at the station.

Information Desks and Ticket Kiosks

4.106. Where staffed ticket sales counters, information desks and customer assistance points are provided, they should be located within the obstacle-free route and a minimum of one desk should be provided that is accessible to a wheelchair user or person of small stature, and a minimum of one desk shall be fitted with an induction loop system for hearing assistance.

4.107. An intercom system shall be fitted at any counter where there is a glass barrier between the passenger and the staff member. The glass barrier shall consist of unobstructed and unreflective clear glass.

¹² BS 5839-1: Fire detection and fire alarm systems for buildings Part 1 Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises (2017) - note this standard is under review

- 4.108. Pricing information shall be displayed to the purchaser as well as the sales person. The size of the characters shall conform to the character height formula defined previously in Section 4.95.
- 4.109. At the counter of a sales point, card machines should not be fixed, so that passengers can move them closer for easier use and financial privacy. The counter should have a slight upstand at the front edge so that tickets or change do not fall on the floor
- 4.110. Waiting in queues is difficult for people who cannot stand for long periods. One solution is to provide handrails of a type that can be leant on in places where there are often queues or to provide “perch” seating.

Ticket Vending Machines and Other Coin and Card Operated Machines

- 4.111. The following guidance applies to the provision of ticket vending machines and other coin and card operated machines:
- It is essential that wheelchair users, people of varying stature, people with varying degrees of flexibility, manual dexterity and sensory perception can reach, use and interact with coin and card operated machines and devices, including ticket machines, food and drink vending machines, car park payment machines etc;
 - Locations of coin-and card-operated machines should be clearly signposted and easily identifiable;
 - Where ticket machines are provided, they should be located within the obstacle-free route and a minimum of one machine should be provided that is accessible to a wheelchair user or person of small stature. At unstaffed stations or tramstops, an alternative means of ticketing, accessible to visually impaired passengers, should always be available;
 - Coin and card operated machines, and particularly ATMs, should be located in busy areas and should be well lit at all times;
 - The design of all vending machines should enable independent accessible operation;
 - Operating buttons should be at least 20 mm in diameter and must protrude sufficiently to be palm-operated. The coin slot, credit card slot and change / ticket flap should have adequate contrast, so that visually impaired passengers can identify them easily. Tickets and change should be easy to retrieve by people with limited manual dexterity; and
 - Ticket vending machines should be carefully sited so that glare and reflections from natural or unnatural light are minimised on the screen.

Touchscreens

- 4.112. Touchscreens can be used for a variety of functions and can replace a number of buttons. However, not all people will find them accessible to use. People with a visual impairment or people who need a tactile response may require audible instructions or feedback to enable successful use of the screen. Therefore, it may be necessary to provide these in addition to button-operated screens.
- 4.113. In addition:
- As with other screens, touchscreens should be shielded from sunlight and glare;

- The interactive element should be between 700 mm and 1200 mm from the ground;
- The information on screen should be easy to read, understand and see;
- Good contrast and fonts are essential for visually impaired passengers; and
- The touch-sensitive buttons should be similarly contrasted with the background and their labelling.

4.114. Feedback to the user that a ‘button’ has been touched provides reassurance that the system is functioning and responding to instructions.

Toilets and Sanitary Facilities

4.115. Where toilets are provided at a station or tramstop, disabled people should be able to find and use these toilets as easily and conveniently as non-disabled people. If toilets are provided, a minimum of one unisex cubicle shall be wheelchair accessible.

4.116. For stations or tramstops that form part of a larger transport hub or interchange, the installation of a Changing Places (CP) toilet could be considered. A CP toilet is an extended space with a WC, hoist, basin, adult-sized changing bench and optional shower, for use by people with complex and multiple impairments who require the help of up to two assistants. The space needs to be fitted with a fixed tracked-hoist system so that assistants can fit the user’s slings to the hoist and move the person to the various items in the facility.

4.117. In cases where accessible modular toilets are installed at unstaffed stations and tramstops, the interior dimensions and fittings must comply with the requirements of BS 8300 Part 2. Additional space must be allowed for large bins.

4.118. To prevent toilets being locked and unavailable during out of hours or when the station is unattended, it is recommended that accessible toilets are included within the National Key Scheme (NKS) operated by the Royal Association for Disability and Rehabilitation (RADAR).

4.119. The requirements for Accessible Toilets and other sanitary facilities are provided in BS 8300 Part 2.

Doors

4.120. Toilet doors should open outwards with sufficient clearance around the door in the corridor to allow access in an emergency. It is recommended that rising butt hinges are used to ensure that the door does not open unnecessarily, potentially into the path of visually impaired people. Toilet doors should be well maintained and have the hinges and locks regularly lubricated for ease of use.

4.121. Some means of indicating whether the toilet is in use should be provided, preferably using the words “vacant” or “occupied”.

Layout and Accessories

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4.122. The following guidance applies to the layout and accessories in toilet and sanitary facilities:

- The cubicle should be laid out in a way that the washbasin and hand dryer/paper towels can be accessed from the WC;
- The washbasin must be in a position that does not prevent people reaching other fittings, such as towels or a soap dispenser;
- It is recommended that the basin is large enough to accommodate a portable urinal in order to rinse it after it has been emptied into the toilet. A standard-sized washbasin would achieve this;
- There should be a remote sink plug control that can be reached easily and is large enough to operate without difficulty;
- Shiny metal fittings that are cold to the touch should be avoided;
- It is recommended that single-sheet toilet paper dispensers be fitted, which will benefit people with restricted limb movement;
- A hand dryer is recommended in addition to a paper towel dispenser. It must be located either beside the washbasin or adjacent to the mirror. A shaver socket could also be provided near the mirror;
- A mirror should be provided opposite the washbasin. It should be at least 400 mm wide and 1000 mm tall. Its bottom edge should be no lower than 500 mm above the floor;
- A shelf should be provided that is positioned adjacent to the vertical rail beside the wash basin in order that it may be used for colostomy bags;
- A waste bin should be provided, together with a sealed container for used incontinence pads and other disposables. These must be located clear of the manoeuvring space. It is recommended that this is beneath the shelf. Guidance should be provided to passengers about what is appropriate to be placed in the waste bins;
- Other fittings must be designed and placed in a way that makes the toilet easy to use for the widest range of people; and
- All light fittings should be fitted with reflectors or diffusers to minimise glare.

Emergency

4.123. It is recommended that an emergency alarm pull cord is fitted to all accessible toilets. The pull cord handle should be a triangular design which is easy to grip and heavy enough not to swing out of reach if missed initially.

4.124. As an alternative, palm-operable push buttons can also be used if there is one at a higher level and one that is reachable from the majority of the floor.

4.125. The alarm should ring at a continually staffed location, or where it can be easily seen and heard by those able to give assistance. If the station or tramstop is unstaffed the emergency alarm should be connected to another location from where an emergency response can be actioned. To reassure those in distress, visual and aural feedback should be provided to indicate that the alarm has been activated.

Baby Change Facilities

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- 4.126. Where toilets are provided, baby change facilities should be provided in addition to a universally accessible toilet as many disabled people who are unable to use other facilities will not be able to wait for the accessible toilet to become free if it is in use by a baby changing parent. Similarly, an accessible baby-changing facility (if separate to other baby-changing facilities) should not be incorporated in a unisex accessible WC but should be provided in a separate room.
- 4.127. Accessible baby-changing facilities should allow enough room for a wheelchair to turn (i.e. 1500 mm by 1500 mm), which should not be obstructed by fittings below 700 mm.

5. Boarding and Alighting

Introduction

- 5.1. This section provides guidance on the interface between the tramstop and the tram vehicle so all passengers may use the service easily, conveniently and independently and without stress, danger or anxiety. The cornerstone to achieving this is the requirement that all platforms are straight and level with the floor of the rail vehicle, which should be compliant with relevant standards applicable to this interface.

On the platform

- 5.2. Platforms should be a logical continuation of the accessible, obstacle-free route but with the additional interface with trams.

Accessible Platform Design

- 5.3. In general, platforms should be horizontally flat, so there is no risk of wheeled mobility aids or of buggies, pushchairs or wheeled luggage rolling off and falling onto the track. Some minimal gradients are permitted to support drainage on outdoor platforms. Cross-fall gradients should slope away from the platform edge and should be no steeper than a 1 in 40 gradient. Sheltered and indoor platforms should have a shallower gradient.

Accessible, Unobstructed Route

- 5.4. The width of a platform should include a clearway wide enough to allow wheelchair users, mobility aid users and / or people with assistance dogs to pass each other. Recommendations for general horizontal circulation are provided within the DfT / TS's Code Of Practice for design standards which provides a width of 2000 mm plus the width of the danger area. .
- 5.5. Notwithstanding the above, for existing systems, the minimum width of a platform is permitted to be 1500 mm as defined in LRSSB LRG 1.0 Tramway Principles and Guidance.. However, for extensions and upgraded platforms on existing systems, it is recommended, wherever existing infrastructure allows, that the platform width should be 1600 mm plus the width of the 'danger area'.
- 5.6. The danger area is the part of the platform closest to the running lines and consists of a tactile surface plus an additional width to allow passengers to stop once the tactiles are detected. It is recommended that, wherever practicable, the tactile surface is at least 400 mm deep and located between at least 500 mm and 700 mm from the platform edge, thus providing around a metre for people to stop after detecting the surface. In addition:
- Platform edge tactile paving for off-street platforms consist of offset rows of 5 mm high flat-topped domes, 66.5 mm apart on a 400 mm x 400 mm paving module; and
 - Platform edge tactile paving for on-street platforms consist of 6 mm high, round-edged lozenge-shaped bumps. There are six lozenges on a 400 mm x 400 mm module.

- 5.7. The tactile surface should be installed along the full length of the surface and must contrast strongly with the surrounding area.
- 5.8. Further information on tactile paving may be found in DfT guidance on the use of tactile paving surfaces¹³.

On-Platform Facilities

- 5.9. Platform furniture, vending or ticket machines, help points, posts for information signs or signals and any other obstruction should, where practicable, be placed outside of the main obstacle free clearway. All furniture, machines, upright posts, grabrails and pillars should be of a contrasting colour to the surrounding surface and background.
- 5.10. Any columns within the clearway should be highlighted with a contrasting colour. It is also helpful to mark them further with a contrasting, coloured band 140-160 mm wide with the lower edge 1500 mm above the ground and a lower coloured band at ground level.
- 5.11. Parallel posts, for example, those supporting an information sign, should have a tapping rail of at least 150 mm thickness and no more than 200 mm high above the ground to prevent visually impaired people walking between the posts and into the sign.
- 5.12. There should be at least one information and emergency Help Point on each platform. This should be of contrasting colour to the background with raised push-button controls at a height of 1200 mm above the ground. Help Points should meet the guidance previously provided in Section 4.102 - 4.105.
- 5.13. Ticket machines and / or validation machines and other vending machines should also be placed outside of the main clearway and should be of contrasting colour to the surrounding background.

Seating

- 5.14. Seating should be provided where practicable. All seating should be well maintained, comfortable, easy to use and where practicable, a range of seating be provided including, for example, a bench, a platform or horizontal rails that passengers can rest against, at a height of about 580mm, and 'perch rails' at a height of about 700 mm and at least 1400 mm in length. Various seat heights should be provided where practicable; standard seats should be about 450 mm from the floor. Where practicable, there should be a clear space alongside the seating of 900 mm × 1350 mm for each wheelchair where there are fixed seats, plus extra space in consideration of pushchairs and luggage.
- 5.15. Where practicable, shelter at seating and spaces for wheelchair users should be provided, for example, under a canopy or within an enclosed shelter. For seating not located within an enclosed shelter, a tapping rail should be installed around the legs of the chair, of at least 150 mm thickness and no more than 200 mm high above the ground to prevent the risk of visually impaired people walking between the legs and colliding with the seating.
- 5.16. Within a shelter, sufficient clear space should be left to enable a wheelchair user to manoeuvre within the enclosed space.

¹³ Guidance on the Use of Tactile Paving Surfaces (publishing.service.gov.uk)

- 5.17. Wherever practicable, the shelter should be aligned with other platform furniture. Shelters on single facing platforms should be located along the rear of the platform. On island platforms, they should be located centrally.
- 5.18. Shelters should allow all passengers to stay informed of tram arrivals and departures and any critical changes, such as service delays or updated travel information. They should be able to hear announcements and view the customer information system. Where practicable, the ability to see and hear a tram approaching is desirable.
- 5.19. The recommended lighting level inside the shelter is 150 lux.
- 5.20. The use of stainless steel and glass in shelters should be carefully considered and any glass panels should be adequately marked with highlighting or manifestations (see Section 4.64 – 4.81).

Platform Lighting

- 5.21. The following guidance applies to platform lighting:
- To assist safety and security uniform illumination should be provided;
 - A minimum of 100 lux is recommended as measured horizontally at floor level. However, care should be taken not to interfere with visibility of signals for tram drivers;
 - Lighting inside shelters should be a minimum of 150 lux;
 - White artificial light is considered more effective than yellow artificial light in terms of creating a true-colour appearance; and
 - Lighting levels should be good and consistent along the platform, day and night:
 - There should be no sudden differences in lighting levels;
 - Any transition on lighting levels should be smooth;
 - No areas should be excessively bright or dark;
 - There should be no areas of strong shadows.

Fencing and Barriers

- 5.22. Protection should be provided when the rear of a platform is open; it is recommended this be in the form of a raised kerb (which may be used as a tapping rail for long cane users) or a kicking board in addition to a fence or barrier. The tapping rail should be at least 150 mm thick and no more than 200 mm above the platform; the lower edge of a kicking board also should be no more than 200 mm above the platform surface.
- 5.23. The entrances to platforms from lifts, escalators, ramps or stairways should be parallel with the platform edge wherever practicable, to minimise the chances of people falling onto the line. Where this is not practicable, barriers should be provided, preferably 1200 mm high, with cross members, to prevent any passengers or assistance dogs from accidentally falling over the platform edge.
- 5.24. Barriers should also be provided at terminal platforms or bay platforms to protect the area beyond which trams normally stop (ie behind the buffer stop).
- 5.25. Where platforms terminate in an end ramp that leads to the track for the ease of maintenance work, passengers should be prevented from walking down the end ramp

and onto the track. A fixed barrier should be provided at the end of the level platform surface, at least 1100 mm in height; it should be fitted with cross-members and be rendered to contrast with the background against which it is seen. It may need to be fitted with a lockable gate so that there is access to the track for maintenance staff. A sign bearing the wording "No entry – staff access only" or similar should be affixed to the barrier. The barrier should be fitted across the entire width of the platform, up to and aligned with the inner edge of the tactile warning surface(s) on the platform edge.

Customer Information

- 5.26. The provision of customer information on platforms should follow the same guidance as for within main stations and tramstop areas in terms of positioning for optimal viewing angle, avoidance of glare and reflection, colour contrast, use of letters and symbols as appropriate and font size (see Sections 4.82 – 4.98).
- 5.27. Information should be provided in both a visual and audio format with tactile signs also provided for static information, such as platform number, etc. On-platform information should be accurate and kept up-to-date. There should be consistent and non-conflicting messages between audio and visual information.
- 5.28. The information should include expected and actual arrival and departure times, service updates and safety warnings. Consideration should be given to the number and frequency of announcements and amount of information given as too much can cause confusion for people with varying degrees of sensory perception.
- 5.29. The location of the wheelchair space(s) on the tram should be clearly indicated.

The Platform Tram Interface

- 5.30. The interface between the stationary infrastructure and a vehicle edge is a fundamental determinant of whether the transport system in question is considered accessible or not. 'Accessibility' is no longer a consideration of whether a transport system is usable, but whether it is *equally, independently* usable for all passengers. This relies on both the platform and the features of the exterior doorway working harmoniously together to form an integrated accessibility solution.
- 5.31. There has been much recent research in this field to inform and drive a change that removes the existing barriers to independent use of a number of rail transport systems.
- 5.32. To provide the best practicable platform-tram interface it is critical that platforms are as straight as practicable. Some curvature is permissible but the chord made by the side of the rail vehicle and the platform must create a very small gap and therefore the platform radius should be large. The minimum practicable platform radius will depend on bogie length, door position, vehicle width and any articulation.

The 'Gap'

- 5.33. To provide a continuation of the accessible and obstacle free route through stations and tramstops, it is recommended that the gap between the edge of the platform and the door threshold of a tram (the 'Gap') is no more than 20 mm horizontally and 20 mm vertically up or down under normal PTI conditions.

- 5.34. If the tram has a fixed stepboard or moveable step at the exterior doorway, the vertical distance between the step and the floor of the vestibule immediately inside the exterior door should be no more than 20 mm.
- 5.35. For existing systems, the requirement for the Gap is stipulated in the Rail Vehicle Accessible Regulations 2010 (RVAR)¹⁴. These requirements state that a boarding device to assist a wheelchair passenger must be fitted if the Gap is greater than 75 mm horizontally and 50 mm vertically (in either direction). However, research has shown that compliance with these dimensions does not remove a barrier to travel for many passengers who are wheelchair users, have a mobility impairment or have visual impairment. A mobility scooter is mechanically able to drive over an RVAR-compatible Gap but users will often find it painful to do so.
- 5.36. Opportunity should therefore be taken during upgrades, improvements and fleet replacements to provide a Gap that is closer to the 20 mm x 20 mm recommendation above as far as practicable.
- 5.37. Requirements for a manual boarding device are given in RVAR. Where an existing Light Rail system does not meet these accessibility requirements, it is recommended that a strategy is developed to improve the PTI within an agreed timeframe.

External Doorways on Trams

- 5.38. The properties and features of the external doorway are just as important as the Gap in enabling independent boarding and alighting at tramstops. The majority of requirements for exterior doors and their features should comply with RVAR and are briefly outlined here together with any further recommendations.

Doors

- 5.39. The following guidance applies to doors:
- Exterior doors shall contrast visually with the vehicle exterior either side, including the window and any door control panel. The doors closest to the wheelchair space(s) shall be clearly indicated at a height easily and comfortably readable by a wheelchair user;
 - Door controls shall be sited within reach of all users, typically between 700 mm and 1200 mm above the platform surface and should be palm operable; and
 - Audible warnings shall be activated when the doors start to open and for 3 seconds before the doors start to close. A different warning sound is required for each of these events.

Width

- 5.40. To support independent accessible use of the the service, it is recommended that all exterior doors should have a clear useable width of 900 mm. This 900 mm clear width should extend from the doorway to the centre-line of the vehicle.

¹⁴ The Rail Vehicle Accessibility (Non-Interoperable Rail System) Regulations 2010 (legislation.gov.uk)

- 5.41. For existing fleets, RVAR Section 6 mandates a door width of at least 850 mm. Again, opportunity should be taken during fleet upgrades to improve on this dimension in order to allow additional space for the hands of wheelchair users, wider mobility scooters, passengers with assistance doors etc.

In the Doorway

- 5.42. The following requirements regarding doorways are mandated in RVAR.
- The threshold of the exterior doorway shall have a colour strip of at least 100 mm depth running the full width of the door opening that must contrast with the adjoining floor surface;
 - The floor at the entrance threshold to a rail vehicle must be lit by a light within or located immediately next to the doorway; and
 - Handrails must be fitted either side of an exterior door to provide support during boarding and alighting.

Passenger Information

- 5.43. Information showing at least the service route identifier and destination should be provided on the exterior of the vehicle at the front, rear and along the sides.

6. On-board

6.1. Accessible on-board requirements broadly cover four areas that are covered within RVAR and summarised in this section:

- Seating;
- Wheelchair spaces;
- Access and movement within the vehicle; and
- Passenger information.

Seating and Priority Seats

6.2. The following guidance applies to seating and priority seats:

- Handholds must be fitted to the top of the back of each passenger seat to provide stability when moving through the vehicle, as stipulated in RVAR, Section 10;
- As defined in RVAR Section 13, at least 10% of the passenger seats must be designated as priority seats and clearly identified;
- However, it is known that disabled passengers experience problems with a lack of availability of priority seats, especially when considered with the needs of pregnant or elderly passengers or people with non-visible disabilities. It is therefore recommended that a higher percentage is given over to priority seating; and
- It is preferable for priority seats face the doors so that people using them can see if others need to use them. If there is available space, providing room to allow for an assistance dog to lie down can be helpful.

Wheelchair Spaces

6.3. RVAR Section 18 stipulates that any rail vehicle must have at least one wheelchair space. Therefore, a tram with the capacity to carry at least 100 passengers (seated or standing) must have at least 2 wheelchair spaces.

6.4. As approximately 2% of the UK population are wheelchair users, it is recommended that where practicable, that the number of wheelchair spaces provided in line with this measure.

6.5. RVAR Sections 6 and 20 provides requirements for wheelchair spaces. These should be clearly identified and should not be obstructed or blocked either permanently or temporarily and should be accompanied by signage including the prioritisation of this space for wheelchair users as provided by the Supreme Court ruling in the case of *Paulley vs FirstGroup plc*¹⁵. This requires drivers, operators and other members of staff to be given training to assist removing any barriers to wheelchair and scooter users requiring the spaces.

6.6. There must be sufficient space in and around a wheelchair space for a wheelchair or scooter user to manoeuvre within the tram.

¹⁵ FirstGroup Plc (Respondent) v Paulley (Appellant) - The Supreme Court

- 6.7. The wheelchair spaces should include a call-for-aid device to communicate with the appropriate person in the case of an emergency. If practicable, a power supply point could be provided to allow powered chairs and scooters to recharge during the journey.

Internal Accessways and Movement

- 6.8. The requirements for through routes within a tram are provided in RVAR Section 6. The required width of the wheelchair accessible route from the exterior door to the wheelchair space must be at least 850 mm wide. However, it may be expedient to maintain consistency with the recommended 900 mm width for the exterior doorway if space permits.
- 6.9. A wider aisle width along the tram including inter-vehicle connections may also benefit passengers who are not wheelchair users but who have mobility or visual impairments or who are accompanied by an assistance dog.
- 6.10. Tram floors must be slip resistant and level and any gradients with a maximum slope of 5%.
- 6.11. RVAR Section 14 states the requirements when steps are provided within a tram. During fleet replacement programmes the opportunity should be taken to remove internal steps and minimise ramps within passenger accessways where practicable.

Customer Information and Facilities

- 6.12. RVAR Section 11 states trams must be fitted with a public address system for audible and visual announcements to provide information on the route destination and the next tramstop. As with other information systems around the Light Rail system, conflicting information should be avoided.
- 6.13. Induction loops can be fitted within the vehicle, particularly around priority seating areas and accompanied by induction loop signs where they are fitted.
- 6.14. Displays within the vehicle must be viewable from at least 51% of seats and by at least 51% of priority seats. As far as practicable, displays should be located where they will not be affected by glare from on-board lighting or external light sources, including sunlight. The displayed contents should provide a visual contrast so that the text, images and pictograms of the message can be clearly read from all viewing angles.
- 6.15. Where on-board ticket machines and / or validation machines are provided, they should have a clear space in front of them so that they can be used by anyone without obstructing the accessway. As with other areas on the system, these should contrast with the surrounding areas and readable instructions and reachable controls.

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Appendix A: Reference / Source Documents

Source Documents used and / or referenced within this guidance include the following:

- The Rail Vehicle Accessibility (Non-Interoperable Rail System) Regulations (2010) (RVAR) [The Rail Vehicle Accessibility \(Non-Interoperable Rail System\) Regulations 2010 \(legislation.gov.uk\)](https://www.legislation.gov.uk)
- National Technical Specification Notice Persons with Reduced Mobility (PRM) (2021)
- Design Standards for Accessible Railway Stations (Department for Transport and Transport for Scotland, 2015) [Design standards for accessible railway stations \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)
- BS 8300: Design of buildings and their approaches to meet the needs of disabled People – Part 1. External Environment – code of practice (2018)
- BS 8300: Design of buildings and their approaches to meet the needs of disabled People – Part 2. Buildings – code of practice (2018)
- BS EN 16584: Railway applications — Design for PRM use — General Requirements — Part 1: Contrast (EN 16584-1); — Part 2: Information (EN 16584-2); — Part 3: Optical and friction characteristics (EN 16584-3). (2017)
- BS EN 12414: Vehicle parking control equipment. Requirements and test methods for a parking terminal (2020)
- BS EN 81-40: Safety rules for the construction and installation of lifts. Special lifts for the transport of persons and goods Stairlifts and inclined lifting platforms intended for persons with impaired mobility (2020)
- BS 5489-1: Design of road lighting. Part 1 Lighting of roads and public amenity areas. Code of practice (2020)
- BS 7953: Entrance flooring systems – selection, installation and maintenance (1999)
- BS 6262-4: Glazing for buildings Part 4 Code of practice for safety related to human impact (2018)
- BS EN IEC 60118-4: Electroacoustics. Hearing aids Part 4 Induction-loop systems for hearing aid purposes. System performance requirements (2015 and 2018)
- BS 5839-1: Fire detection and fire alarm systems for buildings Part 1 Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises (2017) *Note this standard is under review*
- Wayfindr Open Standard Recommendation 2.0 – <https://www.wayfindr.net/open-standard>
- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (Department for Transport, 2021)
- Station Car Parking Good Practice Guide (Rail Delivery Group, 2018) <https://www.raildeliverygroup.com/component/arkhive/?task=file.download&id=469773838>
- Guidance on the Use of Tactile Paving Surfaces (Department for Transport, 2021) [Guidance on the Use of Tactile Paving Surfaces \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)
- Research on Experiences of Disabled Rail Passengers (Department for Transport, 2019) [Experiences of disabled rail passengers \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)
- The SLL Code for Lighting (Society for Lights and Lighting, CIBSE, 2012) *Note this guide is under review* [CIBSE - Building Services Knowledge](https://www.cibse.org/~/media/Files/2012/SLL-Code-for-Lighting-CIBSE-Building-Services-Knowledge.pdf)

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- Train Technical Specification (HS2 Ltd, 2019) [Train Technical Specification \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)
- Supreme Court ruling, Case ID UKSC 2015/0025, 18 January 2017: *FirstGroup plc vs Paulley* *FirstGroup Plc (Respondent) v Paulley (Appellant) - The Supreme Court*
- LRG 1.0 Tramway Principles and Guidance (TPG) (LRSSB)