NetworkRail

Inclusive Design

Front Image
Passenger Circulation
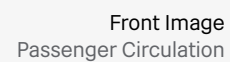
Document verification

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Introduction

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This document is intended to promote a common approach to inclusive design. It also gives an overview of the procedures that Network Rail (NR) expect project teams to apply when designing and delivering stations and other related facilities. It signposts to information, standards and further procedures that will help project teams and others to achieve inclusive design and delivery.

As the public body responsible for managing and maintaining Britain's national rail infrastructure, Network Rail is determined to take a proactive approach in improving standards of inclusive design within the industry.

Our vision is to deliver high quality infrastructure that is inclusive, accessible, convenient and welcoming for everyone, including our workforce. To be at the cutting-edge of inclusive design we need to tap into creative thinking, and to find innovative solutions that place people at the heart of the design process.

The test of the design will be in the service that is enabled, and the user experience achieved as a result of not only the station design but the operational and communication aspects of running the station that goes with it. Consequently, it is essential that an ongoing conversation is had between designers and those who will manage the station.

Inclusive design should be the ultimate goal of every designer, engineer, architect, accountant, sponsor, project, programme, and facility manager. Design can and should deliver beautiful buildings that are inspiring and enjoyable to use, but which also deliver our ambition of making transport as inclusive and accessible as possible.

About this document

Purpose

The purpose of this document is to provide guidance in the scoping, design and delivery of inclusive and accessible environments in stations and other occupied buildings across the Network Rail estate.

Scope

The guidance is aimed at:

→ Project sponsors & developers,

→ Designers and project managers,

→ Station managers, and anyone involved in the:

- Briefing,
- Design and delivery,
- Renewal and maintenance of stations on the network.

1

**Section 1
Inclusive Design**

A brief description of inclusive design, why it is important and the social / economic benefits. We also outline our key objectives, accountabilities and approach to design management procedures.

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**Section 2
Sensory Environs**

Guidance on creating inclusive sensory environments. These include heating, lighting, tonal contrast and other key strategic design principles.

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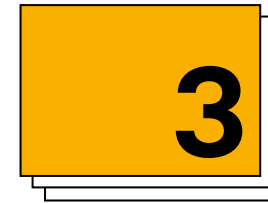
**Section 3
Journey, Facilities and Platform**

Guidance creating inclusive journeys through stations, including arrival at the station, key station facilities and making the platform experience inclusive.
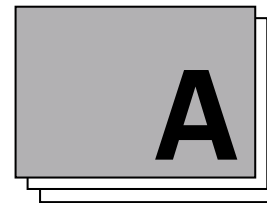
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**Section 4
Fixtures and Fittings**

Focused guidance on designing and specifying inclusive fixtures and fittings across station spaces.

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**Section 5
Operations,
Communications, Digital**

Focused guidance on developing inclusive operational, communication and digital station systems and technologies.

A

Appendices A–E

- Case Studies
- Definitions
- Image Credits
- Reference Documents
- Acknowledgement
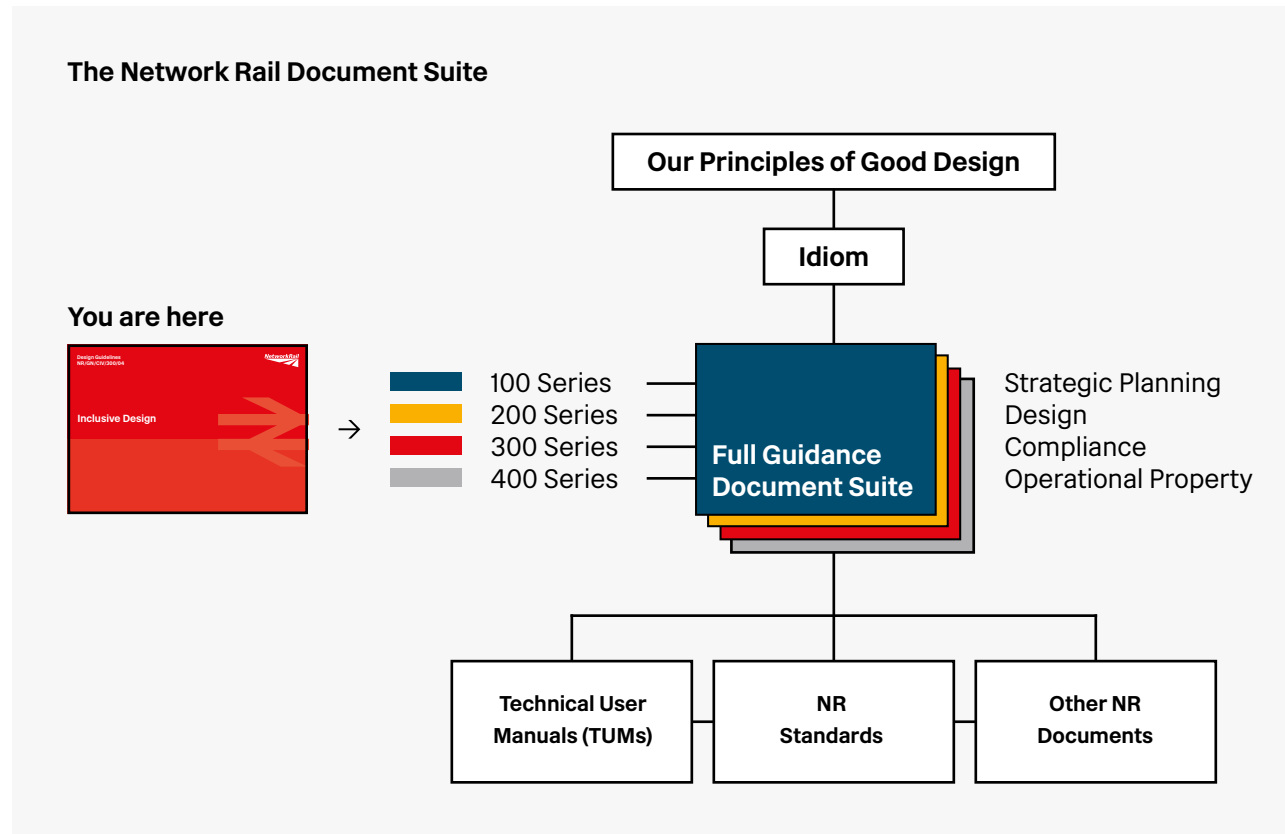
How to use the guidance suite

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The Network Rail Document Suite

You are here

Figure 0.1 Network Rail document suite summary

References to other documents

Code of Practice Guidance
National Standard
Network Rail document
European Standard

Example

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

NR Guidance Suite Reference

Station Design Guidance
NR/GN/CIV/100/02

This guidance has a **Network Rail standards Green status**, and the contents do not require derogation.

However, attention is given to the Department for Transport's (DfT) Design standards for accessible railway stations and the PRM-NTSN against which derogations may be required.

A full list of relevant documents, and other guidance suite documents is contained in the appendix.

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Image 0.1
Passenger Circulation

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Inclusive Design

Inclusive Design
1.1 What is inclusive design?

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1.1.1 Spaces and places for everyone

The British Standards Institute defines inclusive design as:

"The design of mainstream structures or services that are accessible to and usable by, as many people as reasonably possible, in a wide variety of situations and to the greatest extent possible without the requirement for special adaptation or specialised design."

Inclusive design is a process that aims to deliver spaces and places for everyone. When achieved it means that everyone benefits from the full range of services and opportunities that Network Rail can offer.

From the outset, design processes should consider how buildings and environments can be made easily usable and enjoyable for as many individuals as possible. Designing and managing the built environment in an inclusive way is essential if we are to provide independent access without additional undue effort or special separation and so that we maximise independence.

Design that is inclusive should be inherently:

→ welcoming to everyone
→ responsive to people's needs
→ intuitive and safe to use
→ flexible and adaptable.

Designs that are inclusive should also:

→ offer choice when a single design solution cannot meet all user requirements
→ be convenient and dignified to use without undue effort, so as to maximise independence
→ result in an effective service outcome and positive user experience for both customers and staff
→ work well with the operational and communication aspects of running the station inclusively.

Inclusive design and accessibility are related terms which overlap, but they are perceived differently. Accessibility can be seen as being enforced through legislation and the requirement to meet minimum standards. This approach alone is unlikely to deliver a railway fit for the future. Inclusive design, on the other hand, can be seen as covering a broader remit and being about the service outcome and achieving positive user experiences for everyone. It is about removing barriers that create undue effort; avoiding separation or special treatment wherever possible; and enabling everyone to participate equally, confidently and independently in mainstream activities.

Meeting the access requirements of our passengers and other stakeholders is an integral part of what we do. We want to be on the leading edge of inclusive design and in order to achieve this we may require creativity and lateral thinking to find solutions that everyone can use easily, safely and with dignity.

As a national carrier it is our duty to identify barriers to access and find innovative solutions. Where practical we aim to exceed minimum standards. We cannot cover every eventuality but we should deliver what is reasonable to expect. This guidance is intended to assist designers, maintainers and operators by setting out key aspirations for inclusive design, outlining certain design features that should be considered and the principles that underpin the need for them, and signposting to current best practice design guidance and standards. It should be read in conjunction with the headline document Our Principles of Good Design which is the Network Rail Inclusive Design Strategy. This gives a broader overview of the process and principles of inclusive design, and Everyone Matters: Network Rail's diversity and inclusion strategy (section 4.1 Access and Inclusion Matters). Other key reference documents that give guidance on inclusive design and mobility should also be referred to:

→ BS 8300-1:2018 Design of an accessible and inclusive built environment, Part 1: External environment – Code of practice
→ BS 8300-2:2018 Design of an accessible and inclusive built environment, Part 2: Buildings – Code of practice
→ Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, Department for Transport, 2021
→ British standard PAS 6463:2022 Design for the mind – Neurodiversity and the built environment – Guide. 2022.

Inclusive Design
1.2   Why is inclusive design so important?

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1.2.1   Delivering a better railway

One of our commitments in a *'Better Railway for a Better Britain'* is delivering a railway that is fit for the future.

The rail network does much more than transport passengers. It fosters social inclusion by connecting people to homes, jobs, childcare facilities, education/training, volunteer opportunities, hospitals, shops, leisure facilities, families and friends. An inclusive rail network that is inclusively designed and managed can enable people to make these connections and play an active role in their community and contribute to their local and wider economy.

The UK's demographic is changing, we are fast becoming an ageing society. By 2041 one in four of the population is set to be over 65. With age comes increasing issues relating to physical, sensory and potentially neurological impairment, as well as experience of disability resulting from physical and societal barriers.

The effects of our ageing population, combined with growing numbers of economically active older and disabled people, may have a profound effect on the requirements for inclusive design which could create both challenges and opportunities for operators and design professionals.

Design and associated operational and communication considerations should respond to the needs of marginalised groups and deliver social benefits and commercial opportunities. Inclusive design will be vital to the rail industry going forwards:

→ when our stations are more accessible and inclusive we meet more people's needs. We may attract a broader range of passengers including not just disabled people but also passengers with luggage, prams and bicycles, for whom level changes can create barriers

→ when our offices are more accessible we can attract more disabled people and people with other access needs to apply for jobs at a wider range of locations

→ when our services meet passenger needs more effectively they are less likely to choose other transport modes, and may make journeys easier for people who also use other travel modes before or after their train journey too

→ when passengers have positive user experiences of travelling with us, we build loyalty and a good reputation for NR and the rail industry as a whole.

It is generally the case that by considering sectors with special needs the outcome of considering those needs results in an improved environment for the majority of users and a better design.

Understanding diversity within the population

Addressing barriers to inclusion early in the design process

Providing convenient easy access to all areas of the station
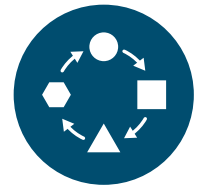
Creating a flexible design that can be used in different ways

Accommodate all people regardless of their age, ability, gender, identity, beliefs

Responding to user groups' needs and allowing all user groups to be able to use station facilities equally

Inclusive Design
1.3 Testing design assumptions

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1.3.1 Persona narratives/scenarios

A Persona Narratives/Scenarios approach was used to inform a review of the previous version of this design manual and to update it. This approach uses the method of creating personas of example rail users (people with mobility difficulties for example), then developing scenarios for the personas, which go into more detail on the variety of requirements that a persona might have, for example manual wheelchair user/walking aid user.

Utilising this approach can help to consider a comprehensive, relevant, and wide range of people's needs. It can be used by designers and other manual readers to help understand and test design assumptions, and to help assess the accessibility of designs (alongside undertaking appropriate engagement and consultation and seeking specialist advice).

The following list was created for undertaking access audits of UK rail stations and is an example of how this approach has recently been used within a rail context. It utilises the Maslin-Clinton Envelope of Need and includes the five persona headings of Mobility, Auditory, Visual, Neurological, Metabolic needs and communicates the five main areas of need that all people have.

The examples under each heading are some specific Scenario examples of people's requirements that sit within with the five areas of need:

Mobility

→ Manual wheelchair user who does not walk.

→ Person with mobility difficulty who uses a walking aid but not a rollator.

Visual

→ Blind, non-sighted guide dog user who has no light perception.

→ Partially sighted cane user who can see text but with difficulty.

Auditory

→ Deaf British Sign Language (BSL) user who is profoundly deaf with no hearing.

→ Person with partial hearing, for whom hearing aids are sometimes, but not always, useful.

Neurological

→ Person on the autistic spectrum who is independent, and hyper-sensitive to sensory and social aspects of environments.

→ Person living with dementia who has difficulties with memory and confusion (neurological, not physical need) and who may also have learning difficulties.

Metabolic

→ Person with dietary requirements such as diabetes, who has needs ready access to hydration and food.

→ A person with toiletry requirements who has continence difficulties and uses continence aids.

The above list was created to score station assets against specific needs and therefore makes very specific distinctions.

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1.3   Testing design assumptions

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1.3.2   The Persona Narrative Approach

In practice, and for the purpose of rail professionals utilising the Persona Narratives and Scenarios approach that underpins this example list, it should be understood that people's specific needs can vary greatly. It is also important to appreciate that:

→ people can have multiple needs and preferences which often interact and overlap

→ some people's needs are also accentuated, for example, a Changing Places facility user who has complex/multiple physical impairments, may also use a powered chair.

As well as looking at how design supports equitable use for the five main areas of need, people's requirements and preferences that relate to their other characteristics should be considered, as is covered by Equality Act legislation. These can be considered by thinking about all of the following:

→ age
→ disability
→ gender reassignment
→ marriage and civil partnership
→ pregnancy and maternity
→ race
→ religion and belief
→ sex
→ sexual orientation

The Persona Narratives and Scenarios approach draws on service design thinking to help consider an inclusive user experience. In a rail context, this could mean thinking about end-to-end and multi-modal journeys, varied types of use and activity within and around stations, and varied roles or groupings of people, for example:

→ different needs of staff, and passengers/customers

→ the needs of disabled people who use/ want to use active travel modes

→ commuter and leisure use (thinking about the speed of people's movement, familiarity with environments, if people are moving in a social group or individually)

→ business visitors and other people who: may have limited capacity to navigate environments and systems where English is the main language; and/ or are not familiar with UK rail station systems and procedures such as how to buy tickets

→ large groups of people (school groups, sports groups, guided tours, social care groups, large families etc.)

→ parents and families

→ carers of adults (family, friend, personal assistant, social care etc.)

→ couples and pairs of people, in particular older couples, where both people might have a range of accessibility needs.

Image 1.1 Sunflower lanyards and ticket holders - symbols used to raise awareness of hidden disabilities

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1.3   Testing design assumptions

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1.3.3   Example Persona Narratives

Image 1.2 Example persona 1

Image 1.3 Example persona 2

Image 1.4 Example persona 3

Siti Amzah

Siti is a student commuting from the suburbs to her school in central London every morning. She often buys her breakfast and uses some of the amenities at the station before taking her train. Siti then takes the underground to go to her school. She does the same journey in the afternoon to get back home.

Sally Jones

Sally regularly needs to visit her local hospital. Sally lives in a village in Devon and takes a bus from her house to the Station. Sally then likes to walk from the Station to hospital. Sally is partially sighted and travels with a guide dog.

Ahmit Kumar

Ahmit lives in the countryside but visits Crewe regularly for work. Ahmit would like to plan all aspects of his trip in advance, including a taxi from his home to the station, a member of staff to help him from his taxi in to the Station, a place to wait for his train and some assistance when getting to his train from the waiting place.

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Image 1.5 Example persona 4

Image 1.6 Example persona 5

Image 1.7 Example persona 6

Lucia Lubreras

Lucia lives in London but travels regularly to see her family in Aberdeen. Lucia can only eat certain types of food and needs to use the toilet at short notice. Lucia likes to travel at quieter times and pre-plans her journeys carefully.

Ali Nasir

Ali lives in Manchester and works for Network Rail as part of the Passenger Assistance Team at Manchester Piccadilly Station. Ali works shifts typically lasting 9 hours per day. Ali works 5 days in a row and then has 2 days off - sometimes Ali works at weekends and during Bank Holidays.

Daniel Tranberg

Daniel lives on the outskirts of Glasgow and visits Edinburgh around once a month to see friends. Daniel has from a mild form of dementia and travels with his Mum who is his carer.

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Image 1.8 Example persona 7

Image 1.9 Example persona 8

Image 1.10 Example persona 9

Alice Roy

Alice is autistic and travels alone from her apartment, in Cardiff, to Bristol where she joins her weekly therapeutic session. Alice likes to allow plenty of time for her journey and often spends this reading or working in the station lounge.

Hiroshi Sato

Hiroshi lives in Tring and commutes to London 3 times a week to work in Bloomsbury. Hiroshi travels at peak times so that he can get to work for 9am and catches a train home between 6pm and 7pm.

Joe Smith

Joe lives in a local suburb and has a flight to catch from Birmingham Airport. Joe has a long foreign holiday planned and has lots of luggage to take with him. Joe plans to take a large taxi from his home in to the Station.

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1.3 Testing design assumptions

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1.3.4 Station environments and the five areas of need

Throughout this manual, personas, narratives and scenarios are used to help discuss key aspirations for inclusive design. These personas consider the five main areas of need, as well as people's protected characteristics, their journey types/activities, and overall user experience. Some further example considerations that relate to the five areas of need, and that relate to context of rail buildings and environments are:

1.3.5 Access requirements in greater depth

People of all ages might have one, or a range of access need(s). People's disability and any related needs might be visible to others, might be hidden, and people might have both visible and hidden disabilities. Someone with accessibility needs might be a carer for another person/people.

Mobility requirements

People with mobility difficulties might be wheelchair users (powered or manual, accompanied or unaccompanied), have ambulant mobility (using a walking aid or not), be temporarily injured, or might be pregnant. People travelling with buggies, luggage, and small children will also have particular needs.

Some disabled people might use a standard or adapted cycle as a mobility aid, then be able to walk a distance unaided, or with a walking aid or other assistance, such as carrying luggage.

Visual requirements

Some people are blind and have no sight, whilst some people are partially sighted with some levels of sight; the underlying condition and level of sight that partially sighted people have can vary. Blind or partially sighted people might use a navigation aid, might use no aid, might be accompanied by a companion/personal assistant or use an assistance dog. It is important to consider that people's capacity to navigate whilst blind or partially sighted varies greatly, for example due to the length of time someone has had a visual difficulty or due to the time of day and lighting conditions.

Auditory requirements

Some people are deaf and have no hearing, whilst some people have partial hearing, or sensory processing difficulties which affect hearing. As with any sensory difficulty or condition, the principle of designing for 'at least two senses' is important, for example visual information is important for people with hearing difficulties, in addition to good acoustic design.

Metabolic and toiletry needs

People's metabolic needs can vary greatly, depending on the persona and scenario. It is important to appreciate that when someone plans or sets out on a journey that they can be confident that they and their companions can access suitable toilets, on accessible routes, that are clean, well-maintained and easy to find.

Neurological requirements

Please refer to the subsection below which goes into further explanation of this hitherto much-overlooked area.

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1.3 Testing design assumptions

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1.3.6   Neurological considerations

It is important to factor in people who may have a diverse range of neurological needs, including people with neurodiverse conditions, such as people on the autism spectrum, or living with dementia or similar conditions and/or who are impacted by certain aspects of sensory environments. Neurodiversity can be understood as an umbrella term, that includes many more conditions, however, a main factor to appreciate is that people's experience of built environments, services, and systems will vary greatly. Different aspects of environments, systems and services can impact different people in different ways, and what can pose as a barrier to an accessible and inclusive journey experience can vary widely.

The recently published design standards *PAS 6463:2022 Design for the mind – Neurodiversity and the built environment – Guide* gives guidance on how to design the built environment to include the needs of people who experience sensory/neurological processing differences. It is relevant to all rail professionals who have responsibilities related to inclusive design and can be referred to when utilising the Persona Narratives and Scenarios approach discussed above.

There are some typical ways in which rail environments and journeys are likely to interact with people's neurological and sensory processing needs or experiences, such as:

→   people's potential need for assistance on arrival (with wayfinding in larger environments, buying tickets, dealing with live/changing timetabling information for example)

→   the need for people to keep track of time and have confidence getting to train departures in time, whilst bearing in mind how exposure to daylight can help people navigate their way through time and how lack of exposure to daylight can be disorienting in this regard

→   the need for clear and legible wayfinding, including legible routes and layouts

→   acoustics, and potential impact on people's communication, comfort, and ability to use information systems and services

→   potential impact of visual stimulus from screens, advertising, signage, artwork, and décor/patterns on walls, floors and other surfaces.

→   the impact of noise, smell and lighting including the stimulus that retail, food and beverage outlets produce

→   quiet spaces and rest points (indoors and outdoors) for people who can become overwhelmed by sensory stimulus (which may include trains, stations, plazas, or ongoing modes of transport).

→   thermal comfort for people of all ages

→   understanding/use/experience of both permanent and temporary features or activities (art installations, markets or similar)

→   positive sensory opportunities that are not pervasive but that people can elect to engage with either by accessing a location where a stimulus exists and can thereby experience stimuli out of choice or can be accessed by one or more the more elective senses, such as touch and taste.

Aspirations and design considerations for people with neurological needs are further discussed throughout this manual, in conjunction with other needs and requirements.

Inclusive Design
1.4 The benefits of inclusive design

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1.4.1 An inclusive estate

Inclusive design should be the ultimate goal of every designer, the client team and facility manager. It has relevance to our whole estate and includes: stations, station staff facilities and associated crossings, footbridges and outdoor areas such as plazas. Whilst not directly covered in this document, it also has relevance to other facilities accessed only by staff, such as depots, and will enable staff to do their jobs more effectively and safely whilst benefiting both ageing staff and staff who can meet the core requirements of their roles despite impairments that they might have. In adopting inclusive design principles, we want our estate to be as easy to use and enjoyable for as many people as possible, reducing barriers that prevent people from accessing our facilities. We believe we can deliver inspiring, creative and beautiful buildings at the cutting-edge of inclusive design.

1.4.2 Six key benefits

In developing our principles for inclusive design we have therefore identified six key benefits, which are:

→ safety
→ passenger satisfaction
→ future proofing
→ financial gains
→ revenue
→ assurance

More details of these principles are outlined in sub-sections 1.4.3 to 1.4.8 as follows:

1.4.3 Safety

Inclusive spaces and places are safer because they are designed with people's needs and behaviours in mind. You can see specific examples below.

Lifts that are easy to find are more likely to be used by people with luggage and buggies, as well as people using wheelchairs, reducing accidents on escalators.

Good lighting and passenger information boards reduce the risk of people gathering in unsafe locations whilst searching for routes or information.

Platforms that are easier to find reduce the likelihood of our passengers running for trains, thereby reducing the risks of slips, trips and falls.

Induction loops and reliable real-time information assure hearing-aid users receive safety announcements, updates on delays and platform alterations.

Accessible, well-signed and well-lit footbridges encourage people to cross the track where it is safe to do so and help to reduce the occurrence and fear of crime.

Safely placed seating encourages people to use our stations more independently, reducing the requirement for people to stop, sit or lean where it is unsafe.

Evenly distributed lighting helps blind people and partially sighted people to get around more easily whilst also reducing slips, trips and falls for everyone.

Accessible kitchens in our workplaces reduces the risks of burns and spills for all our employees.

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1.4   The benefits of inclusive design

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1.4.4   Passenger satisfaction

As we deliver inclusive infrastructure across the network, we believe this will benefit all our passengers. This is because measures that support disabled people, older people, and other people with a range of characteristics and/or needs will help improve overall user experience. For example, clear signage, inclusively designed lighting, accessible and frequent seating provision and unobstructed pedestrian routes help everyone.

Technologies such as Augmented Reality (AR) and smartphone technology may assist people with neurological and sensory needs to navigate our stations, whilst becoming useful to a wider range of people.

1.4.5   Future proofing

The UK's demographic is changing, becoming culturally more diverse and older. With age comes an increased incidence of disability.

Understanding the requirements of this changing demographic will help us plan for the future and deliver more relevant, comfortable and accessible services and facilities, giving older and disabled people, and any accompanying family, carers and companions the confidence to travel by train.

1.4.6   Financial gains

Cost is often used as a reason for not delivering inclusive design but many elements like clear signage and good lighting are no more expensive. In our experience, not considering them costs more in dealing with complaints, legal challenges and issues that can emerge later in a project's life-cycle, causing delays which can damage our reputation and passenger loyalty.

Similarly, incorporating inclusive design later in the design process may mean that more cost is incurred as projects evolve. These costs can be minimised by understanding end user requirements from the start of the design process. Assessing and testing user needs and assumptions can be done by utilising the Persona Narratives and Scenarios approach, as described in Section 1.3 Testing design assumptions of this manual.

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1.4   The benefits of inclusive design

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1.4.7   Revenue

According to Disability Rights UK, 83% of disabled people have been 'turned away' from buying products or services through a lack of access or unhelpful staff. We aim to address both of these issues by providing access through good design and changing our behaviour to support an inclusive passenger experience.

It also makes good economic sense to provide station environments which are easy to access for a range of people including disabled passengers, families and other groups, and people with cycles, luggage or prams so that everyone can enjoy our facilities, shops and restaurants as part of their train journey.

The value of the 'purple pound' that is disabled people and their families is worth an estimated £212 billion to the UK economy and older people's spending is estimated to be a further £100 billion.

1.4.8   Assurance

Inclusive design is an important part of our assurance process through which we demonstrate many of our legal obligations including but not limited to:

→ The Equality Act 2010
→ National Planning Policy Framework
→ Persons of Reduced Mobility National Technical Specification Notice
→ Design Standards for Accessible Railway Stations: A Code of Practice
→ Building Regulations
→ Rail Vehicle Accessibility Regulations.

Most notably we have a Public Sector Equality Duty under the Equality Act 2010 to show due regard to eliminate unlawful discrimination, foster good relations and advance equality of opportunity. Also included in the Equality Act is the duty to anticipate the needs and requirements of those seeking to access goods, services and facilities offered via our premises.

Standards Reference

Department For Transport
Inclusive Mobility Guidance

Design For The Mind - Neurodiversity and the Built Environment - Guide
PAS 6463:2022

Transport for All
Are we there yet?

Inclusive Design
1.5   Socio-economic benefits and opportunities

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1.5.1   Our approach

Our approach to designing and managing the built environment is one of care and consideration that reflects the requirements of a diverse range of people and provides a 'wraparound' inclusive environment.

Through inclusive design we can help to deliver social inclusion and economic benefits for local communities, users, Network Rail and its key stakeholders.

In 2019 the Design Council undertook an outline Network study titled Railway for Everyone which explored the opportunities and challenges associated with making rail travel open and available to as many people as possible.

Strategic design issues were addressed including those related to inclusive design and key socio-economic benefits facilitated through transport infrastructure connectivity:

→ **benefits to people** – how access and use of the rail network improves people's lives

→ **benefits to places** – how the rail network benefits places and spaces

→ **benefits to processes** – what efficiencies are provided through the rail network.

This study served as a strategic counterpart to the work being undertaken by Network Rail in this area of research and the development of this document.
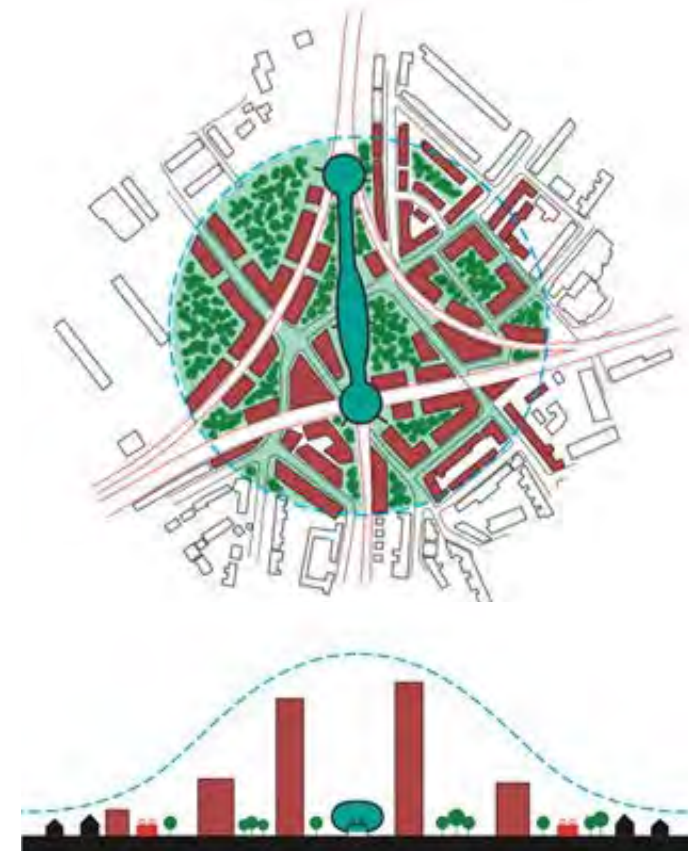

Image 1.11 Transport orientated development (TOD) concept

NR Guidance Suite Reference

Masterplanning at Stations Design Manual
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Inclusive Design
1.5 Socio-economic benefits and opportunities

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1.5.2 People

Investment in transport infrastructure and improved connectivity can deliver many wider social and economic benefits. Rail is one of the safest and most environmentally sustainable forms of transport and can deliver these benefits locally, regionally and nationally. Access to the rail network can improve people's lives in many ways including:

→ enabling people to live and work in locations otherwise difficult to access

→ providing access to employment, training, education, volunteering, and leisure

→ providing access to wider public services and schools

→ connecting families and communities

→ supporting improved social mobility for those without a car, who cannot drive (such as some disabled people) or are not permitted to drive (such as children or people with particular health conditions)

→ helping to support and drive the economy

→ enabling economic activities directly or indirectly.

1.5.3 Places

Good public transportation can underpin regional development and the building of new places, creating homes and jobs. It is therefore important to develop coordinated strategic transportation and urban planning that might release socio-economic value and create high quality liveable communities that are environmentally sustainable.

Strategies such as transport orientated development (TOD) can help to deliver improved quality of life. This includes building new stations combined with high-density mixed-use business/neighbourhood centres on brownfield sites. Development clustered around stations helps create walkable and wheelable developments, with good access to rail services leading to increased rail travellers combined potentially with high quality public spaces. The principle benefits of TOD include:

→ more people able to travel by public transport

→ public spaces where cycles and pedestrians are given priority

→ more open space and green infrastructure

→ public spaces for local community activities

→ increased social and economic activity

→ direct income to communities and local businesses.

1.5.4 Processes

To deliver projects that are meaningfully inclusive, people should be placed at the heart of the design processes to create spaces and places for everyone.

Inclusive design should not be an add on, but rather an integral part of the design and development process that is embedded throughout a project.

We are committed to training our staff in the value of an inclusive approach to design and operational management to create more accessible and inclusive places, processes and products.

Design assurance processes should be utilised to monitor and measure the delivery of inclusive design standards within projects.

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1.5   Socio-economic benefits and opportunities

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1.5.5   Targeted investment

As the national rail service provider, we understand the benefits of targeted investment in transport infrastructure in terms of improved connectivity and opportunities for transformative development, social inclusion and economic improvements to an area.

Station developments should form part of a broader vision and masterplan for transport connectivity and local development. Station masterplans for the immediate surrounding area should be able to accommodate a wide range of potential development scenarios that may encourage inward investment.

Fully integrated transport oriented development (TOD) close to stations might also produce an appreciable increase in the numbers of those travelling by rail and might be a fundamental part of achieving a viable business case that may attract inward investment, regional growth and prosperity.

Partnership working can also bring about additional resources and collaboration to improve what is on offer at stations and at the interchange with other transportation modes, through the provision of mobility hubs,

rail infrastructure investment creates significant land value uplift within catchment areas that increases the closer the development is to a station. Land that is within a walkable distance (1.5km) may be at a premium.

Policies that support land value capture should be implemented so that community leaders can recover and reinvest land value increases for the wider economic benefits of such communities. These policies should include:

→ economic and strategic planning to optimise benefits of investment

→ robust business case based on ridership numbers supported by regional growth

→ the formation of development corporations (where appropriate), with planning and delivery tools to implement a clear vision inspired by inclusive design thinking and social economic thinking

→ mechanisms to harness contributions to the cost of infrastructure from key beneficiaries in private and public sectors, including local authorities, transport operators and land developers.

Image 1.12 TOD concept

NR Guidance Suite Reference

Masterplanning at Stations Design Manual
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1.5 Socio-economic benefits and opportunities

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1.5.6 Place making

Inclusive design linked to placemaking can help to deliver the socio-economic benefits of the rail network and investment in transport infrastructure to the communities that they serve, especially if the concepts of Partnership Working and Mobility Hubs are employed as part of a placemaking approach.

Station development should be a contextual response to the site that acknowledges the local heritage and cultural diversity of an area to create a unique place, that local communities can relate to which is vibrant, a catalyst for growth and environmentally sustainable.

The development of buildings and environments, with distinct and recognised heritage value, can pose typical and unique challenges in relation to accessibility and inclusivity. It is nevertheless important that accessibility and inclusivity needs and opportunities are considered when alterations are made to buildings, and that a clear approach and process is set out for how to address accessibility and inclusivity within the context of heritage. We encourage a sympathetic approach to heritage but one that does not shirk from making changes where necessary and to grasp the opportunity to make meaningful change within the ongoing heritage narrative of a living place that serves the people that use it. History, after all, is a continuum and does not stop at some arbitrary date in the past and for heritage to have true value it should not cease to serve the function for which it is being used.

The station should be at the heart of communities and a place that welcomes and serves local people and station users. It should embrace the needs of the community and address the local context through attractive and meaningful connections, including unpaid public routes through the station.

The station plaza has potential to become a 'town square' that can support local businesses such as cafés, shops, health clinics, gyms, and crèches. There might also be opportunity to offer green and quiet spaces and playful design features and opportunities. Public spaces should be flexible, adaptable and able to support a programme of activities such as markets, temporary pavilions, performance, meeting places, and art installations. To support use for a wide range of persona needs and scenarios, public spaces and temporary activities needs to be designed, laid out, and managed so that temporary activities:

→ are accessible for a range of personas and scenarios

→ do not interfere with people's use of permanent features that support accessible use, such as circulation routes and wayfinding features.
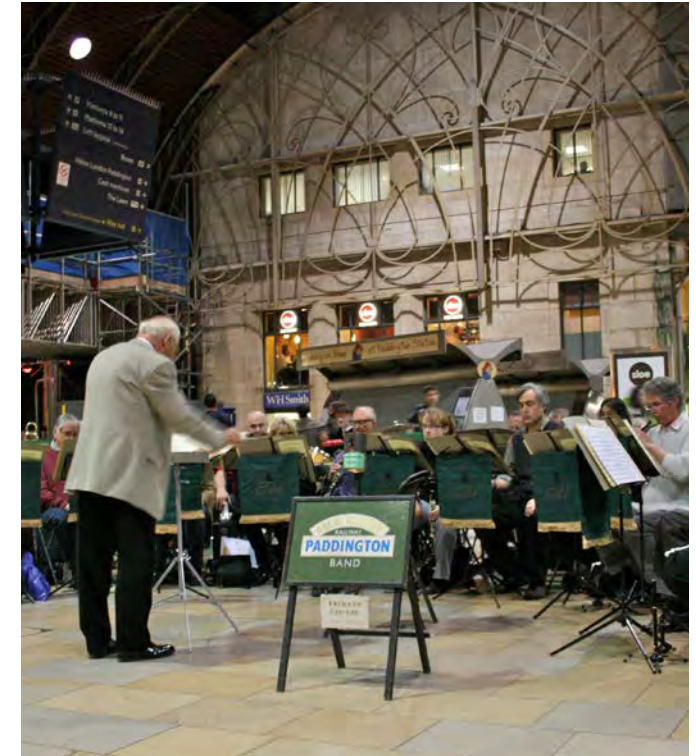

Image 1.13 Paddington station band

Inclusive Design
1.6   Partnership working, mobility hubs and stations as places

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1.6.1   The problem

On occasions, especially at small unstaffed stations, it will be difficult for sponsors of station works to find the funding to deliver on the provision of some key enabling facilities — such as ticket assistance, personal safety/security and toilet provision — or even the human resource to manage and maintain such facilities. This is due to limits on capital expenditure and/or operational expenditure. However, unless sponsors explore means of addressing such gaps in provision, some people will be deterred from traveling by rail if such facilities don't exist at a particular station. This owing to the reasons noted below.

→   Some people experiencing digital exclusion, and assumptions that can all too easily be made with regards to the suitability of online or ticket vending machine purchases. Whilst it is increasingly common practice for people to make online purchases via computer or mobile phone or to use ticket vending machines, some people can still find digital devices difficult to access, whether because of sight, learning, language, confidence or age.

→   Some people feeling and/or being particularly vulnerable to crime. It is known for example that women and girls in particular can feel particularly vulnerable in particular situations, and experience disproportionate incidents of risk to their personal safety in public spaces. Moreover, people with other distinguishing characteristics might experience hate crime, especially where there is a lack of other people. Furthermore, some people may find it difficult to detect or easily respond to potential threats owing to their age, mobility, sight, hearing or neurological capabilities.

→   A significant number of people experiencing urgency when it comes to seeking use of a toilet. Mobility, continence, pregnancy, age related conditions or travelling with young children can all play a part in people's experience of urgency when seeking a toilet. Moreover, the infrequency of some train services and concerns with regards to the reliability of operational toilets on trains tends to put a further strain on whether someone will be sufficiently confident to travel by train without incident. This can be further compounded by the desire of some people, with particular access requirements, to arrive in good time for onward travel and thereby having to wait longer for their train to arrive (with or without functioning toilets).

Consequently, whilst some people will plan longer journeys via larger stations with ticket offices and/or toilet provision, a lack of ticketing assistance and toilets at smaller local stations, would act as a potential barrier to some people especially if they want to travel regularly to nearby locations.

Image 1.14 Solihull mobility hub

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1.6   Partnership working, mobility hubs and stations as places

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1.6.2   Recommended approach

Owing to the potential gaps in provision, sponsors are encouraged to explore how such key enabling facilities could be either provided or signposted to, through liaison and consultation with local authorities, local transport providers, local communities and businesses.

For example, if enabled via an agency agreement, facilities such as local post offices could be identified where tickets might be purchased, or locations might be identified where toilets might be accessed within the community.

Alternatively, a mobility hub consisting of a kiosk and an accessible toilet could be provided through community and business partnership. Such a mobility hub could serve not only rail passengers but people using local transport and active travel. This could be enabled by inviting a food and beverage provider (through appropriate terms of agreement) to not only attract its own custom, but to provide sustenance to travellers, ticketing assistance, and maintenance and supervision of toilet facilities.

Moreover, mobility hubs could also accommodate things like post boxes, deposit boxes for online parcel orders, secure facilities for cyclists and display rail and local travel information. Staffing of kiosks could also provide a greater level of presence in or near the stations and thereby provide greater reassurance to people entering the station environment.

Appropriate terms of agreement with kiosk operators could also provide access to CCTV feeds for theirs and others safety too.

The lack of a sense of personal safety/security and of such facilities as toilets does not only impact rail journeys, but local transport and active travel decisions and will be one of the reasons why people prefer to use their cars. Therefore, it makes sense for there to be a collaborative and inter-modal effort between all who are keen to see more people using public transport and active travel for their journeys.

The benefit of local partnership should not be seen as only about provision of key enabling facilities, but one of placemaking - as a means of enhancing social and economic value and creating a "sense of place." Indeed, some initiatives already exist or have been explored, such as the East Midlands Stations Alliance's Stations as Places initiative.

Image 1.15 Bolton cycle hub

Inclusive Design
1.7   Personal safety

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Image 1.16 Crewe station Virgin staff leading child to help

1.7.1   Personal safety and security

Personal safety and security, or people feeling and being safe within rail environments, should be considered and addressed within design. This is because a lack of perceived and/or actual personal safety can present barriers to people embarking on rail journeys. This can affect all users, however some people are more likely to experience threats to their personal safety than others.

Women, girls and gender diverse people experience disproportionate levels of threats to their personal safety in public spaces. When combined with mobility, sight, hearing, comprehension, communication and/or health difficulties, this can increase a person's perceived or actual vulnerability. Other people with particular characteristics also experience hate crime, and the ways in which people's characteristics intersect can affect the extent to which their safety is affected when undertaking journeys.

For example, an older woman might have different experiences to a younger woman or teenage girl. Designing to improve and enhance safety for women and girls supports improved personal security for all people.

The issue of safety of women and girls is the responsibility of a wide range of bodies and stakeholders. Improving personal safety for all people, women and girls, and other targeted groups of people using rail buildings and associated public space will need to be part of strategic (and possibly existing) partnership work, and sometimes may be part of place-focused programmes.

However, there are ways in which the presence and nature of various design elements and features can help support people to feel safe and comfortable when using rail buildings and associated spaces.

Standards Reference

AtkinsRealis
Getting Home Safe

NR Guidance Suite Reference

Security at Stations
NR/GN/CIV/300/02

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1.7   Personal safety

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1.7.2   Potential answers

Aspirations and design considerations are discussed throughout this manual, however some overarching themes that are understood to contribute to improved feelings and experience of personal safety are as follows:

Lighting

Lighting that is even, good quality, consistent, and does not cause accessibility issues can help make spaces more attractive, legible, and usable.

Assistance

Ease of finding assistance from rail station staff on arrival to a station, if needed.

Help points

The importance and role of any help or assistance points, or systems that enable people to seek help in real-time, and their locations, availability, and accessibility. Public understanding of such points is important, as well as the operators' understanding as to what help may be needed, and the capability of staff responding to calls to put the right help into action.

Visibility and surveillance

It is important to provide good visibility and surveillance, especially for platforms, bridges, walkways and lifts, and on routes to facilities that may be away from main circulation routes. Planting and public realm features should enable sight lines to be maintained.

CCTV

The presence of CCTV with good coverage is important, however there are questions relating to CCTV being useful in real-time unless it is constantly monitored. There also needs to be capacity for monitoring staff to communicate through PA systems, and for there to be timely in-person help from appropriate staff/services.

Wayfinding and route options

Good wayfinding, and appropriate and legible route options are important, as is carefully placed accessible signage and other information for permanent and temporary routes. Specific needs of disabled people should be considered when new or adjusted routes are provided as, even with cane-detectable information, some blind, partially sighted and other people will be at a particular disadvantage if they are not informed about ongoing and accessible routes.

Phone charging and connectivity

Phone charging facilities, good mobile coverage, and free Wi-Fi can be beneficial for a range of personal security and travel needs.

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1.7 Personal safety

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Activity

The design and placement of any activities near stations, in connection with transport interchange points and/or places where people will wait are important, including mobility hubs, cycle parking, car parking, public transport interchanges, and other spaces such as in public realm.

Events and offers

The programming and management of various spaces for the purposes of events and offers has potential to enliven spaces and places at times that may otherwise have low footfall/passive surveillance at certain times, for example through retail activity, attractive public realm and plaza programming.

Placemaking

The layout and design of spaces that people will sit, circulate, and socialise in, to support increased use and footfall, support a range of appropriate place-related uses, and offer spaces that people feel safe to use.

Maintenance

Well-maintained and clean spaces help to communicate that a place is well-cared for and signal that antisocial behaviours and criminal activity are not welcomed or tolerated by how the station environment presents itself.

Temporary works

There are potential impacts that can arise as a result of temporary works/sites, and changes to related route and wayfinding information. As such sites can result in a lack of passive surveillance, and altered or changing routes that may be overly quiet.

Refer also to Sections on Lighting Bridges, Underpasses, Walkways, Circulation and Public Realm

Inclusive Design
1.8   Suicide prevention

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1.8.1   Working with others

This section gives an overview of the work that Network Rail is currently doing to support suicide prevention and to help provide opportunities for intervention, where this is appropriate.

Network Rail works to support suicide prevention and reduce other impacts that result from incidents of suicide, including working in partnership with local authorities, the wider rail industry, Samaritans, British Transport Police and other prevention agencies, experts, and charities to support the national suicide prevention agenda.

More information is available at:

https://www.networkrail.co.uk/communities/safety-in-the-community/suicide-prevention-on-the-railway/.

This work happens through various programmes, initiatives and measures. Some are more rail-specific and locally focused and some are part of wider suicide prevention programmes. As part of this partnership work, Network Rail's work in this area includes initiatives such as:

→ training railway employees to offer support and intervention
→ running communication and prevention campaigns
→ deploying potential new mitigation measures
→ contributing knowledge to support development of national strategies and guidance
→ development and research relating to innovation in this area.

A core concept that Network Rail works with is that suicide is everybody's business. It is recognised that opportunities for personal interactions and interventions are an important part of tackling loneliness; this is relevant to more immediate risks relating to potential incidents of suicide. Suicide prevention strategies and measures are in place to support communities with people within them who have higher risk factors for suicide, and to support prevention work that takes place within a wider community-based context.

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1.8 Suicide prevention

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Image 1.17 Small Talk Saves Lives Samaritans campaign

1.8.2   Increasing opportunities for intervention

Suicide prevention is relevant to inclusive design as it is part of considering people's needs at any given time, and because the design of built environments can support the activities that staff, and sometimes the public, do that play a role in preventing, or responding to, risks of or incidents of suicide.

Many aspects of design that are relevant to general personal safety are also relevant when thinking about how design can work to support Network Rail suicide prevention programmes and efforts. The more people that are about, and the less opportunities there are for people to hide near high-risk locations, and to prepare for attempting suicide, contributes to an environment where suicide attempts are potentially less likely.

Whilst the objective is to reduce suicide attempts, the imperative is to foster opportunities for intervention whereby help can then be offered. This can, to a large degree, be about increasing the window of opportunity for intervention, which often relates to the time between the person who could intervene being alerted and the point at which someone might attempt death by suicide. This can therefore have a bearing on how stations are designed and the point(s) and ways in which opportunities are opened up, whereby someone could intervene.

Inclusive Design
1.9 Emergency evacuation

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It is important for designers to think about accessibility and equitable evacuation in the event of an emergency holistically. Although emergency evacuation will be covered in Section 5 of this document, it is important to stress the significance of emergency evacuation at the outset of this document. Consequently, considerable effort should be put to considering what means would be employed to get everybody to safety in the event of a fire (or other threat to life such as a bomb/terrorism) and how people will be alerted of such threats.

It is important to understand the issues that diverse people face when seeking safety, and the related operational and communication implications. It will therefore be important to consider these issues within the Diversity Impact Assessment and the Hazard identification processes.

Things to consider early on in a project, include:

→ means by which people with different needs can be alerted to a threat

→ means by which people can, where possible, evacuate independently

→ an understanding that not everybody can be easily transferred across to some evacuation devices and that where evacuation lifts are provided, they require a trained person to operate them

→ the role staff may have in facilitating emergency egress

→ the likely response times to an incident at staffed and unstaffed stations

→ refuges (from where staff responding to an incident need to retrieve people) should be regarded as a last resort and should be avoided wherever possible

→ shelter from inclement weather (whilst people wait to be retrieved), should be considered at refuge/muster point if there is no feasible alternative to a refuge/muster point being provided

→ people who are most vulnerable to inclement weather could be most vulnerable at smaller, more remote and unstaffed stations

→ significant coordination is often needed between architects, fire engineers, lift engineers, pedestrian flow specialists, access consultants, station facilities operators to determine suitable evacuation strategies, within busy, large or below-ground stations evacuation can be somewhat more complicated

Image 1.18 Refuge point alarm

Refer also to Sections on Operational Considerations and Emergency Communications, Staffing and Training, Means of Escape, Shelter, and Lifts.

Inclusive Design
1.10 Our approach and objectives

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1.10.1 A proactive approach

As the public body responsible for managing and maintaining Britain's rail network infrastructure, Network Rail is committed to a proactive approach to improving standards of inclusive design within the industry. Indeed, a proactive and anticipatory approach forms part of our formal duties under the Public Sector Equality Duty and as providers of Goods Services and Facilities under the Equality Act 2010.

Legislation requires employers, service providers or other organisation to take positive action to enable existing or potential employees or customers, so that any disadvantages that may relate to a protected characteristic(s) can be minimised.

This guidance document describes Network Rail's approach and objectives together with key standards and procedures that we expect project teams to follow in delivering inclusive design consistently.

Underpinning our approach and objectives are six key principle. These are detailed in sections 1.10.2 to 1.10.7.

1.10.2 Consultation

Through active engagement with end users and line-side communities we aim to deliver a higher quality of services. Information sessions are not consultation. Close engagement is necessary to encourage participation by removing perceived barriers and enable us to gather information, understand people's needs and improve safety.

Engagement forums are structured inclusively and in such a way as to gather people's views and provide timely feedback to participants and thereby create positive relationships.

The requirement to consult with people with protected characteristics is mandated through the Diversity Impact Assessment (DIA) Standard (NR/L2/OHS/00135). The Built Environment Access Panel (BEAP) supports meeting the requirement to consult with disabled people.

1.10.3 Collaboration

NR aims to improve collaboration across the entire transport network and deliver more inclusive journeys. This means proactively considering end users' needs from project inception and thinking about the end-to-end journey experience.

Network Rail is applying many 'lessons learned' from other major rail infrastructure programmes including Crossrail and High Speed rail projects, and other recent research. We are working with public bodies, train operating companies (TOCs) and other transport modes that interchange with our infrastructure to deliver a more inclusive passenger experience.

Network Rail continues to share good practice and develop our requirements for inclusive design competence into relevant parts of our procurement processes so that our supply chain can work with us to deliver our objectives.

NR Guidance Suite Reference

Diversity Impact Assessment Guidance
NR/GN/CIV/300/07

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1.10   Our approach and objectives

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1.10.4   Education

Inclusive design is relevant to everyone who works in the built environment including commissioners, planners, access consultants, designers, architects, engineers, surveyors, accountants and property leaseholders.

In 2016 we launched our inclusive design strategy and implemented new standards which have been rolled out across our estate including within stations, depots, offices and training centres.

Our strategy is to raise awareness and develop competencies through targeted training and guidance for people with specific responsibilities. Training and support is being provided for staff responsible for customer assistance, workplace and facility management. Operational management will be key to removing attitudinal barriers.

We support the Hidden Disabilities Sunflower lanyard scheme, which enables our staff to recognise customers with hidden disabilities who may need assistance.

1.10.5   Innovation

We aim to use new technology and innovation to provide better, more inclusive railway infrastructure and to deliver cost effective projects. We actively encourage suppliers and stakeholders to challenge our standards and to apply innovation and creativity to deliver added value.

Applying the principles of inclusive design may often provide new insights into how we interact with the environment, to create new ways of thinking and problem-solving.

One area of particular focus is the design of communication systems to help people with disabilities and improve passenger experience. For example, the application of digital technology and innovation through smartphone applications that provide direction instructions such as augmented reality and beacon technology. We are also developing ways of providing more personalised passenger information to make the rail industry more user-friendly.

The provision of mobility hubs, especially at or near small and unstaffed stations, in conjunction with local authorities, local transport providers, local communities and businesses is something we would also encourage, especially where provision can help address digital exclusion and the barriers experienced by individuals and families with regards to the urgency in needing to find a toilet.

1.10.6   Integration

Incorporating inclusive design principles within our 'business as usual' systems will be key to achieving full integration of this strategy. To this end we are employing various processes and guidance documents and engaging with relevant governance structures.

Through the Diversity Impact Assessment (DIA) process we demonstrate that we have given due care and attention to our decision making and how our works might affect different people and communities and we build the trust of our passengers and stakeholders.

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1.10 Our approach and objectives

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Image 1.19 Network Rail customer support

1.10.7 End-to-end integration

Initial Industry Plans (IIPs) define key objectives for each control period in terms of delivering efficiencies, better value and sustainable economic growth.

IIPs include inputs from cross-industry groups responsible for coordinating industry plans in relation to inclusive design strategies, safety, performance, sustainability, capacity, asset management, technology and innovation. Through IIPs, inclusive design can be integrated into our planned programme of enhancements and renewals.

DIAs are also aligned with our planned programme, project and policy development methodologies including the PACE process. An important element of embedding inclusive design into our work will be regular, timely reviewing and reporting of each project's intent to meet inclusive design principles and updated design guidance.

Inclusive Design
1.11   Accountabilities and responsibilities

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1.11.1   "Compliance" versus responsibilities

It is most important that readers of this manual understand that there is no such thing as an "Equality Act compliant design" as the Equality Act is not a design standard (nor was there such a thing as a "DDA compliant" design, with the DDA also being superseded in Great Britain by the Equality Act).

Moreover, equality legislation primarily pertains to the responsibility of those who commission the station and those who will operate it. Whilst a design could be technically compliant with a regulation, code or standard, it does not necessarily mean that it has addressed all the accessibility issues, which will remain the responsibility of those who will operate it. It is therefore important for designers to test design assumptions and to converse with those who will operate the station.

This will also help operators to collate the necessary information in order to deliver on their anticipatory duties in connection with the provision of goods, services and facilities and their proactive duties under the Public Sector Equality Duty.

It is important therefore to understand that the legal responsibilities for delivering equalities and associated safety considerations (referred to within the industry as "Service Provider Liabilities" and the "Railway Safety Case") will rest with the Station Facilities Operator (SFO), whether Network Rail or a Train Operating Company (TOC), under license as a Service Provider Liability through the oversight of the Office of Rail and Road (ORR).

Meanwhile, the SFO will also have responsibilities to address their Accessible Travel Policy duties set out in the ORR's Accessible Travel Policy Guidance for Train and Station Operators July 2020.

Image 1.20 A Built Environment Access Panel review meeting

Refer also to Section on Testing Design Assumptions.

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1.11 Accountabilities and responsibilities

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1.11.2   Engaging operational stakeholders

Consequently, it is most important that designers engage with the Station Facilities Operator (SFO), who will be operating the station after station works are complete, to assure that the SFO will be able to operate the station equitably and safely once complete.

Examples of where this can be of particular significance are where operators need to manage:

→ communications prior to arrival, on arrival, during travel and in perturbed/emergency scenarios

→ ticketing arrangements and addressing the risks associated with digital exclusion

→ the boarding and alighting of passengers and implications that this has for the platform to train interface, platform widths, location of facilities on the platform and resulting train stopping positions

→ evacuation scenarios in a timely fashion (especially where there appears to be no other alternatives to refuges) or where someone has to reach an evacuation lift to operate the override controls after the lift has come to a halt (following the triggering of an alarm call point or detection device)

→ the equipping and training of staff to offer customer assistance in response to different individual requirements and in response to different operational scenarios, events and failures in systems or equipment

→ maintaining the safe operation of stations in terms of risks to people's personal safety and security – especially in relation to higher risk points such as bridges, subways and lifts.

Diversity Impact Assessments (DIAs) should therefore capture design considerations and construction phase considerations, and also operational and communication considerations that arise in association with the proposed design and work.

Image 1.21 A Built Environment Access Panel review meeting

Refer also to Section on Personal Safety and Design Management Procedures and Diversity Impact Assessments..

Inclusive Design

1.12   Design management and Diversity Impact Assessments

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Image 1.22 Senior members of the public in a station

1.12.1   Our Principles of Good Design

Network Rail has established a process for reviewing design submissions via the Design Advice Panel (DAP) at key points in the design development, with the aim of enabling the achievement of optimal and good design, as set out in the document Our Principles of Good Design (Network Rail, 2020). This review process is led by The Design Council.

The vision behind Our Principles of Good Design is to capture opportunities that may add value through good design and to provide guidance to architects and engineers with regards to understanding how to prepare for reports and standard form submissions.

One of the main principles in Our Principles of Good Design is Inclusive Design, since for design to be "good," inclusive design thinking needs to be integrated into both design and management processes.

1.12.2   Inclusive Design Experts

Project teams should engage with Network Rail experts and appoint access consultant, preferably members of the National Register of Access Consultants (NRAC), or those supervised by NRAC members, to improve the quality of projects in relation to inclusive design and to develop in-house competence to deliver this work.

1.12.3   Engage the wider community

Inclusive design is underpinned by legislation. In the UK the Equality Act 2010 places a requirement on service providers to avoid discriminating against people on the basis of any of nine 'protected characteristics'. Consultations should, therefore, be undertaken with passengers, employees, local authorities, local transport providers and local communities to understand the requirements of people with protected characteristics during the design development and delivery of projects.

This approach is more likely to deliver higher quality solutions that address the requirements of all. Furthermore, we encourage partnership working with entities within the local community, to address identified gaps in provision for the mutual benefit of people travelling by train and other travel modes.

All major building works including station designs and other amenities should consult Network Rail's Built Environment Access Panel (BEAP), who are an independent panel of experts formed to review and advise Network Rail in respect of inclusive design and accessible built environment. This does not preclude smaller projects where particular issues would benefit from being discussed with the BEAP.

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1.12   Design management and Diversity Impact Assessments

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1.12.4   Diversity Impact Assessments

A Diversity Impact Assessment (DIA) is a structured information gathering and decision-making process used to assess and record the likely and actual impact of a current or proposed project, policy or function on diversity and inclusion. DIAs should demonstrate due regard in response to Network Rail's — and any Station Facilities Operator's — Public Sector Equality Duty under the Equality Act 2010. In some instances, the commissioning organisation may be a local authority, in which case it will be important to liaise with the local authority and to draw them into Network Rail's DIA process.

A DIA should anticipate the likely effects of our work on people with the protected characteristics as defined by the Equality Act (age, disability, gender reassignment, pregnancy and maternity, race, religion or belief and sexual orientation, marriage and civil partnerships); in short, everyone.

Undertaking a DIA should deliver evidence-based decision making and involves a seven-step process as illustrated in the DIA Process Flow Chart, within Network Rail guidance NR/GN/CIV/300/07 Diversity Impact Assessments Project Guidance. Ideally, DIAs should be commenced at the project start to inform early decision-making.

Image 1.23 Member of station staff with passengers

NR Guidance Suite Reference

Diversity Impact Assessment Guidance
NR/GN/CIV/300/07

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1.12 Design management and Diversity Impact Assessments

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Evidence gathered should include the technical assessment of proposals by an access consultant and explain how the design team are addressing, or intend to address, any issues identified. Additional evidence may also consist of advice and/or assessments undertaken by other specialists, such as specialists in acoustics, lighting, security, pedestrian flow, wayfinding and vertical transportation.

Where proposals impact on the platform to train interfaces or other aspects of rail engineering, then evidence may be necessary from specialist engineers, Station Facility Operators (SFOs) and Train Operating Companies (TOCs). Where works involve forecourts and interaction with highways, then evidence may also include advice and/or assessments undertaken by active travel specialists, road safety specialists and other highways engineering specialists.

Where consultation takes place with the general public, stakeholders such as access groups (e.g. the Built Environment Accessibility Panel or other local groups) or other entities such as local authorities and/or businesses participating in local partnership initiatives, then this will further add to the evidence that should be captured in a DIA.

A DIA should be an integral part of programme management and be included in the project plan. It should be undertaken for projects, change programmes, strategies, policies (including design policy), major investment decisions, asset closures, renewals, operational considerations, and proposed communication strategies.

Potential impacts identified by a DIA should be used to create an action plan to address and/or mitigate likely or actual impact, and to demonstrate that those commissioning the project and the SFO have not only got the right design in place, but have considered the operational and communication strategies necessary to meet their duties under the Equality Act.

For further advice on Diversity Impact Assessments contact: diversityandinclusion@networkrail.co.uk

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1.12.5   Inclusive Design Statements

Project design teams should prepare a statement that describes how a scheme may address the issues identified in the DIA. The statement should evolve as designs are developed and provide project sponsors with a better understanding of how the designers are addressing accessibility and inclusion issues.

The statement can be standalone or form part of project reports being submitted at each project stage. Where planning and other consents are being sought, then such accessibility and inclusion thinking would also be expected to be the basis upon which design and access statements are written.

For significant projects an Accessibility Consultant should be appointed.

1.12.6   Cost and the application of PACE

Cost can often be used as a reason for not delivering inclusive design. However, many elements like clear signage, good lighting and other elements are not necessarily more expensive if considered from the outset. Even if there is potential for costly items identified at the beginning, then at the very least these are more likely to be budgeted for.

If not, then the cost of integrating inclusive design increases dramatically as a project matures and can either jeopardise the feasibility of a project or lead to undesirable compromises in terms of inclusive and accessible provision. Such costs can be minimised by establishing a thorough understanding of the end user requirements at the very start of the design process, and then correctly translating these requirements into detailed project specifications.

PACE stands for "Project Acceleration in a Controlled Environment" and replaces GRIP "Governance for Railway Investment Projects". It essentially has the equivalent purpose with regards to governance but aims to enable more time-efficient project development.
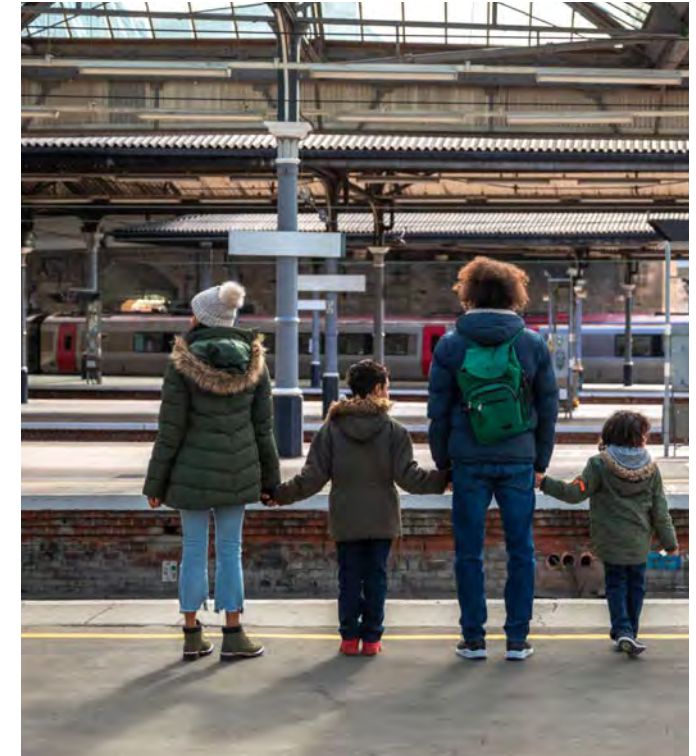

Image 1.24 Family stand waiting on a train station platform

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1.12   Design management and Diversity Impact Assessments

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1.12.7   Project stages

Network Rail's Governance for Railway Investment Projects (GRIP) delineates the procedures for managing and supervising projects aimed at enhancing or renewing the national rail network. This comprehensive process spans from project inception to post-implementation and aims to mitigate risks associated with implementing enhancements on an operational railway.
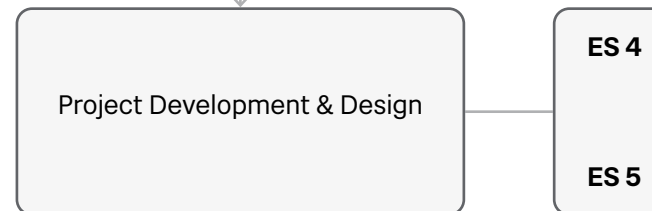
Replacing GRIP, the PACE Framework has been introduced to significantly reduce the time and costs associated with developing, designing, and executing Infrastructure Investment projects within the rail network. PACE offers a customisable project delivery framework tailored to the specific requirements of each project, aimed at streamlining the overall process and improving efficiency.
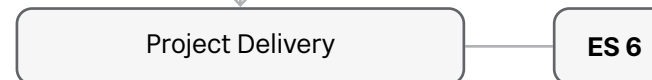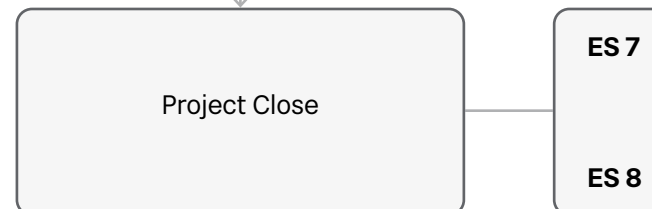
PACE Process

PHASE 1

Strategic Development & Project Selection

ES 1

ES 2

ES 3

PHASE 2

Project Development & Design

ES 4

ES 5

PHASE 3

Project Delivery

ES 6

PHASE 4

Project Close

ES 7

ES 8

GRIP Process

GRIP 1 Output Definition

GRIP 2 Feasibility

GRIP 3 Option Selection

GRIP 4 Single Option Development

GRIP 5 Detailed Design

GRIP 6 Construction Test, and Commissioning

GRIP 7 Scheme Handback

GRIP 8 Project Closeout
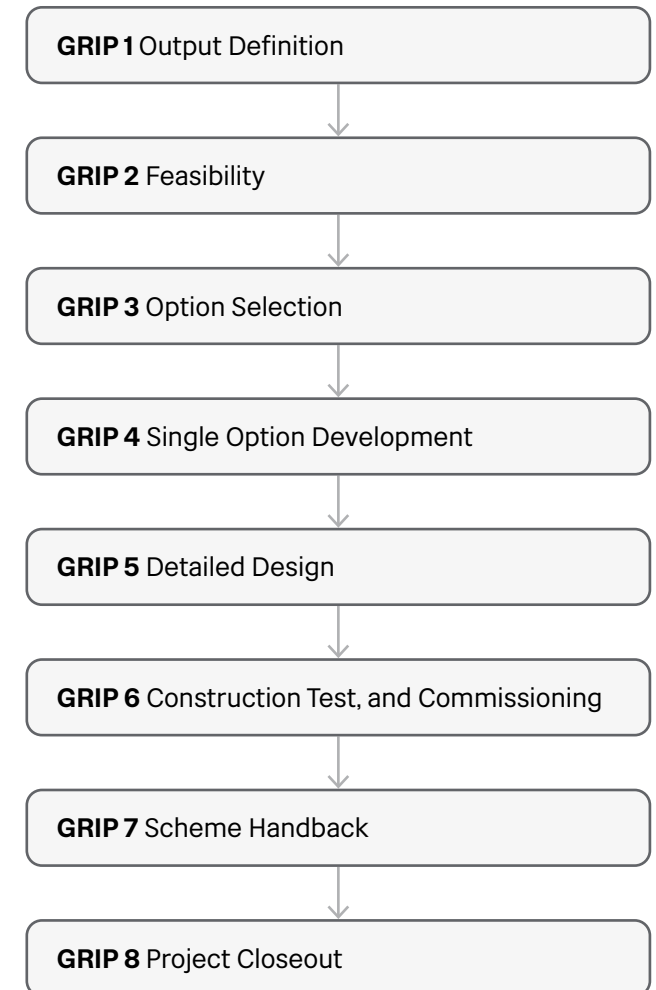
Image 1.25 PACE and GRIP processes: comparison of stages

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Table 1.1 PACE process: inclusive design actions.

PACE Phase 1	**ES1: Output definition**	Designate an inclusive design champion within the client team. Set out a process to embed and implement inclusive design principles.
		Identify potential barriers to access, and opportunities to include a wider group. Seek the input of an access consultant to obtain advice with regards to adequacy of scope.
	ES 2: Feasibility	Engage an access consultant to undertake a review of options being considered. Incorporate key inclusive design requirements into proposals. Produce a first draft of the Diversity Impact Assessment (DIA).
		Consult with potential users including disabled people. Consult those who are to operate the station with regards to how different options might impact on the inclusive management of operations and communications.
		Incorporate an accessibility and inclusion statement within the project stage reports.
	ES 3: Option selection	Consider user feedback. Demonstrate due consideration of inclusive design within the selection process through advice received from access consultant consultation with those who are to operate the station.
		Update the DIA. Incorporate and accessibility and inclusion statement with project stage reports.
PACE Phase 2	**ES 4: Single option development**	Instruct access consultant to undertake a review of options being considered. Address any barriers and demonstrate potential mitigation measures where required.
		Consult with those who are to operate the station with regards to how the selected single option is anticipated to interact with the inclusive management of operations and communications.
		Update the DIA. Incorporate an accessibility and inclusion statement within project stage reports.
	ES 5: Detailed design	Seek advice from access consultant with regards to detail proposals. Consult with potential users including disabled people.
		On medium to large projects, a standalone inclusive design statement or section within a design and access statement can be helpful to describe the detail of how barriers are being addressed. Update the DIA.
PACE Phase 3	**ES 6: Construction, testing, commissioning and completion**	Instruct the contractor on the agreed approach for inclusive design and set this out in the DIA.
		Monitor all aspects of the design to assure compliance with the agreed inclusive design standards.
		Continually assess the success of any temporary mitigation measures in place during construction.
	ES 7: Hand back	Identify post occupancy matters for inclusion in Facilities Management, Operations and Communication considerations.
		Prepare handbook and maintenance manuals with a clear setting out of how the station is to be operated inclusively.
	ES 8: Close out	Publish learning points for future projects. Address any defects. Close project.

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1.12 Design management and Diversity Impact Assessments

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1.12.9   Environmental and Social Appraisal

The design process should comply with NR/L2/ENV/015 Environment and Social Minimum Requirements for Projects – Design and Construction and incorporate requirements pertaining to the Environment and Social Appraisal (ESA).

The ESA is part of the Network Rail set of requirements and should be completed and updated by or on behalf of the Client's Sponsor from ES 2 to 4 to identify the environmental and social risks and opportunities associated with the project.

The completed appraisal should be provided by or on behalf of the Designer, to inform the Environment & Social Risk Assessment (ESRA), Environment & Social Management Plan (ESMP), and to update the Hazard Log and identify and record agreement with regards to ownership of subsequent activities and control measures identified (e.g. noise surveys, security assessments, Diversity Impact Assessments, ecology surveys, Environmental Impact Assessments, stakeholder engagement, operational and communication plans, and recommendations identified etc.).

The Designer and or their specialist ESA appraiser may be called upon to support the Client's Sponsor in reviewing and updating the ESA, when required, using knowledge gathered during the Hazard Identification process and various other activities undertaken.

The designer's project manager is responsible for the delivery of the client's design requirements including environmental and social activities and deliverables. Many of the themes in the ESA should engender positive impacts for people that are created by going beyond 'fit for purpose' and delivering social value that can be measured and reported.

Fostering partnerships with local authorities, local transport providers, communities and businesses shows that Network Rail is:

→   being a caring neighbour
→   connecting communities with the built environment
→   creating engaged employees and positive industry partnerships
→   inspiring tomorrow's workforce
→   keeping communities safe
→   making travel accessible and a great experience
→   respecting cultural history and rail heritage
→   supporting Britain's economic development.

Standards Reference

Project Acceleration in a Controlled Environment (PACE)
NR/L2/P3M/201

Image 1.26
Western Arcade
London Bridge station

2

Sensory Environs

Sensory Environs

2.1 Sensory environs generally

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Image 2.1 Glasgow Central station

Successful inclusive design considers all aspects of the sensory environment. The five senses: vision, hearing, touch, taste and smell translate to design considerations including acoustics, lighting, visual contrast, touch, slip resistance and odour control.

This section of the design guide provides high level guidance on key sensory environ considerations across different areas of the station.

Sensory Environs
2.2 Air quality

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Image 2.2 NR offices Baskerville House

2.2.1 Who and why

Breathing air that is polluted or carries airborne diseases is increasingly seen as a problem for both the general public and staff for both environmental and occupational health reasons. Poor air quality can be particularly problematic for people who have difficulty breathing due to age-related reasons, disability and/ or a long- or short-term health conditions. It can also limit or negatively influence people's journey options and choices if there are routes, facilities, or parts of journeys that they avoid, to try to not aggravate immediate or longer-term conditions, which might not only have an impact on breathing but also mobility.

Air quality is important within:

→   enclosed railway stations or other buildings where inadequate ventilation could have negative consequences, for example passengers and staff can be exposed to poor air quality from diesel train exhaust and airborne metal particles from brake linings and friction between wheels and rails, and

→   semi-open spaces such as some car parks or mobility hubs, and

→   outdoors spaces such as streets and plazas.

Sensory Environs

2.2 Air quality

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2.2.2 Achieving good air quality

To help achieve and maintain good air quality, it is important to:

→ control air quality for indoor environments by replenishing used oxygen and removing carbon dioxide

→ limit the quantity of indoor-sourced pollutants through the appropriate design and specification of materials and systems

→ limit outdoor sourced pollutants through ventilation and air filtration systems

→ consider and aim to mitigate for any potential air quality related health impacts that may be present within semi-open and adjacent outdoor areas.

2.2.3 Design considerations

All new construction and major refurbishment schemes should comply with relevant industry standards for a healthy internal environment through the specification and installation of appropriate ventilation, equipment and finishes.

Enclosed platform areas should have adequate ventilation through natural or mechanical means, including roof vents and cross ventilation.

Mechanical ventilation systems should provide high quality air through the filtration of pollutants.

Throughout all environments, carefully consider all material specifications to avoid volatile organic compounds, combustion by-products and airborne particulate matter which are known to trigger nausea, headaches, asthma, respiratory irritations and allergies.

Reduce indoor exposure to particulate matter from sources outside the building. Particulate filters can be an effective measure for reducing allergic respiratory and cardiovascular disease.

Natural ventilated buildings have fewer incidents of 'sick building syndrome' and support occupant health. However, careful attention also needs to be given to the consequences of natural ventilation on acoustics and thermal comfort, since a wholesale natural ventilation strategy may not be appropriate in all circumstances.

Moreover, adjacent external environments can themselves be a source of pollution rather than fresh unpolluted air. Nevertheless, where local acoustics, external air quality and weather permit then the use of natural ventilation strategies should be adopted.

Standards Reference
The Building Regulations 2010: Ventilation **Approved Document F**
WELL v2 Building Standard **International WELL Building Institute Standards**
Indoor environmental input parameters for design and assessment of energy performance of buildings, 2007 **BS EN15251**

Sensory Environs
2.3   Thermal comfort

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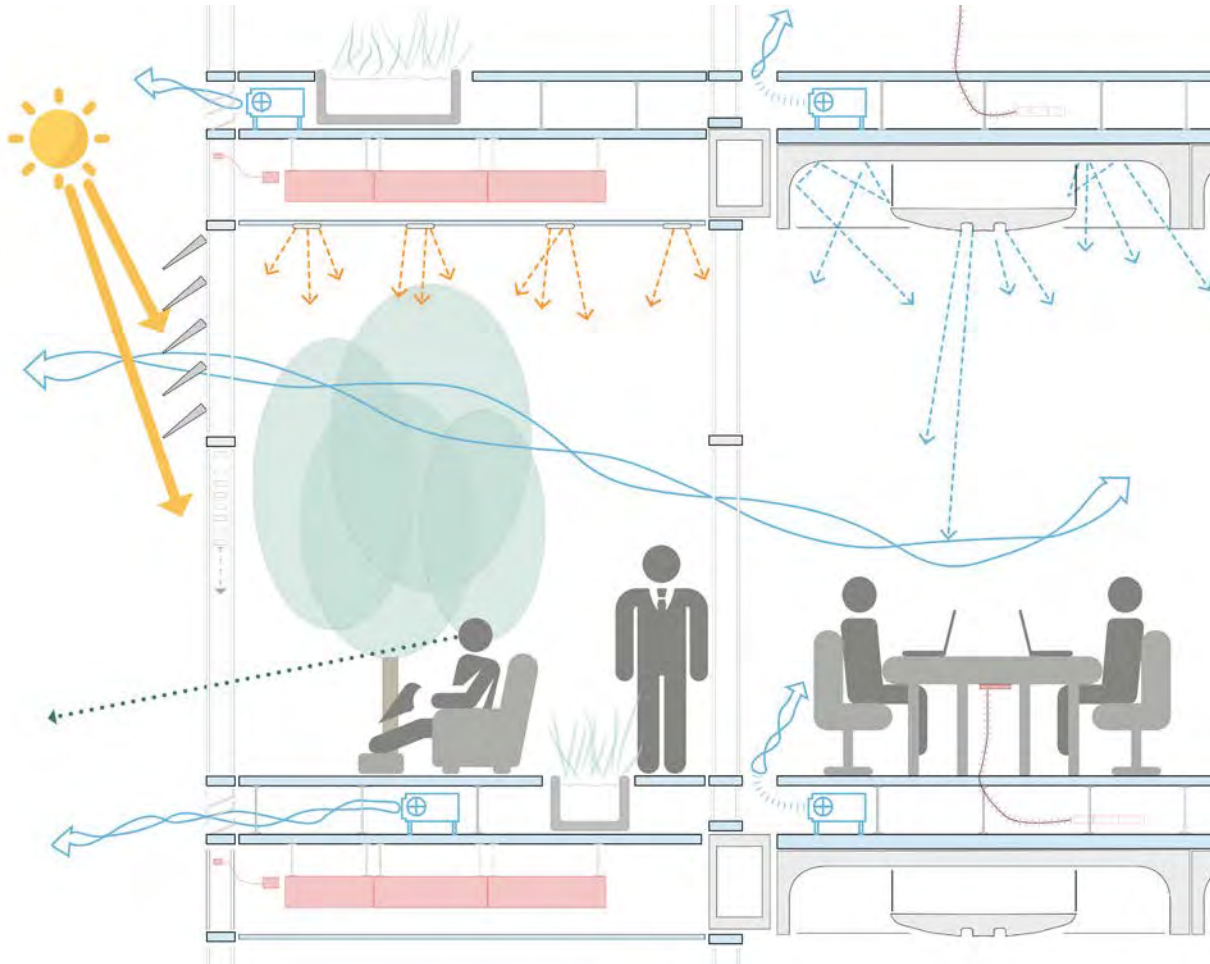NR/GN/CIV/300/04
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Image 2.3 Thermal comfort concept

2.3.1   Who and why

Within our estate we have a wide range of environments including station concourses, platforms, offices, control rooms and maintenance facilities and other places where people work and stand and wait. Many of these spaces are exposed to ambient air temperature and weather conditions.

It is important that both passengers and staff feel comfortable in our built environment.

Feeling too hot or too cold can be a problem for many people, particularly people with mobility difficulties, people who cannot easily adjust to temperature changes and/or those who cannot manage temperature extremes (which might be due to hormonal or other reasons). Dealing with difficulties related to thermal comfort can affect people both physically and mentally, for example feeling too hot can induce anxiety in some people, and some people will struggle if their extremities, such as their hands, get too cold; for example, when grasping a cold handrail.

It should also be noted that babies, some older people and some people with paralysis can have difficulty regulating their own temperature and can quite rapidly get into severe difficulty if exposed to extreme temperatures for too long.

Thermal comfort within our workplace environments also have a significant impact on the staff work experience and can affect productivity and staff health and overall well-being.

Sensory Environs
2.3   Thermal comfort

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2.3.2   Design considerations

Thermal comfort is dependent on more than just air temperature, the following criteria should be carefully considered in the design:

→   air speed
→   thermal radiation
→   relative humidity
→   predominant weather conditions
→   local geography and altitude.

Consideration should be given to the activities and clothing that are likely to be worn in each environment. For example, in more public areas of a station passengers may be dressed for the ambient air temperature so there should be no requirement to heat these spaces, but waiting areas should be provided for the passengers who require them and these should have heating and cooling systems.

Nevertheless, where heating or cooling is not provided, shelter and shade is important. Comfortable waiting rooms/shelters should therefore be provided in otherwise exposed locations within the station environment. Most particularly this applies to platforms, but considering the significance of intermodal aspects of travel, provision of shelter should also be provided for locations serving as bus stops, taxi pickup points, and other points of interchange where one might expect people to be waiting.

Single thermal conditions may not suit everyone. This is due to: potential variations in people's metabolism; other capacity to cope with certain thermal conditions; clothing worn including uniforms; the nature and rhythms of people's work patterns and activities; and temperature preferences. It is therefore preferable to enable individual control over people's thermal environment through a variety of options in publicly accessed areas. Within back-of-house staff areas localised thermal controls are also important.

Whilst taking into consideration the above observations, designers should adjust the design to achieve appropriate thermal comfort levels, according to current Chartered Institution of Building Services Engineers (CIBSE) technical guidance.

Standards Reference

Chartered Institution of Building Services Engineers
AM 11 Building Energy and Environmental Modelling

Chartered Institution of Building Services Engineers
CIBSE: Guide A

Indoor environmental input parameters for design and assessment of energy performance of buildings, 2007
BS EN 15251

The Building Regulations 2010: Conservation of fuel and power
Approved Document Part F

WELL v2 Building Standard
International WELL Building Institute Standards

NR Guidance Suite Reference

Workplace DNA
NR/GN/CIV/400/05

Sensory Environs
2.4 Acoustics

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2.4.1 Who and why

Poor acoustics can be problematic for everyone but particularly for people who are hard of hearing or have neurodiverse conditions. Poor acoustics can pose a particular challenge when disseminating travel announcements or conversing with those from whom one might be seeking help. For some people, poor acoustics might also be overwhelming and potentially disorientating when the impact of unimpeded noise disrupts people's thought processes. Busy and peak travel times can also be particularly challenging for some people within stations themselves and in adjoining external spaces such as noisy plazas or streets.

Acoustic environments play an essential role in enabling customers/passengers to:

→ access audio information including announcements for example for departures or timetabling changes, and for emergency evacuation purposes

→ have conversations in varied types of locations, and for a range of purposes, including whilst seeking assistance or purchasing tickets

→ move around buildings easily and safely, including during emergency evacuation

→ enjoy experiences such as live performances within station environs.

Similar issues also apply to the needs of staff who might find it difficult to communicate with passengers, concentrate or do other activities both in public and back-of-house areas.

Typically, the spaces that can give rise to some of the greatest challenges are large station concourses and platforms with large oversailing roofs, where little attention might have previously been given to sound attenuation and where greater attention is now needed in new station projects or upgrades.

As well as the impact on people's communication and access to information being affected, potential adverse impacts include confusion and/or sensory overload in environments that are too reverberant or noisy, or where echoes, background noise/multiple sources of noise are present. This can be especially problematic for some people on the autistic spectrum, living with dementia or with other conditions that have an impact on processing sensory signals.

It is important to appreciate that people might need to rest from:

→ sensory experiences such as noise derived from crowds, public transport announcements

→ navigating, which can be challenging for some people

→ undertaking physical activity such as walking or wheeling.

Acoustics are therefore especially important within spaces that are expected to be used for rest and/or assistance purposes, such as assistance lounges or quiet spaces that might be sought after for faith and neurodiversity purposes.

Toilet areas should not be excluded from thinking about acoustics either. Quite often the combination of hard surfaces and intense noise caused by some hand driers can pose particular problems for some people.

Acoustic design that supports ease of use of facilities and a positive overall user experience should be incorporated and addressed within both design and management processes.
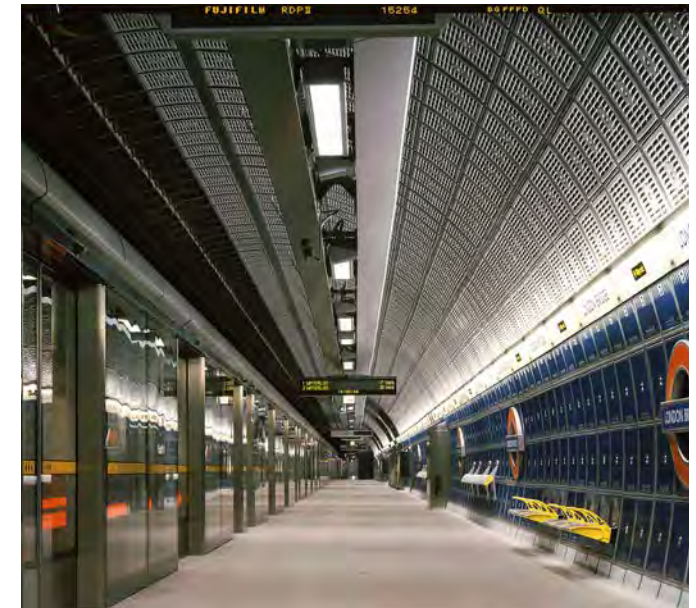

Image 2.4 Acoustic ceiling, London Bridge station

Sensory Environs
2.4 Acoustics

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2.4.2 Design considerations

Some fundamental activities for designers that will help achieve good acoustic design include:

→ developing an integrated design proposal in the early stages of design

→ appreciating the overall customer experience and the role that acoustics can have when it comes to people's comfort, well-being and seeking out information or assistance

→ talking to Network Rail Station Facilities Operators (SFOs) to understand staff activities and how acoustics impact staff

→ understanding the acoustic characteristics of each space/space type and developing the appropriate acoustic characteristics for each space, including the impact this will have on the specification of materials and finishes

→ identifying noise sources in terms of particular spaces, activities or equipment (such as hand dryers or other machinery)

→ developing strategies for the provision of assistive listening systems in appropriate places and locations.

It should also be noted at this point that many strategies that designers have employed for attenuating sound can give rise to visual noise, in that the patterns used to create a balance between sound attenuation and reflection, such as perforated or striated patterns, can give rise to problems for some people with sight of visual processing difficulties. Consequently, great care should be taken to avoid creating an additional set of problems.

Particular sounds generated by trains can also pose an issue, such as when trains seek to negotiate tight bends and points whilst entering and departing the station. This can also adversely impact those living or working near to a station. Consequently, it is beneficial to converse with track engineers to discuss what can be done to minimise this kind of noise occurring.

Areas where spoken communication happens should ideally be acoustically isolated from other areas or building functions that generate large amounts of noise, by using partitioning, sound absorbent surfaces or buffer zones to exclude/contain high levels of noise. A combination of absorbent surfaces (whether horizontal or vertical) may be needed in order to achieve better acoustics overall.

Good acoustics are also important within any spaces that are expected to be used for rest and/or assistance purposes, such as some seating (for example seating set back from main circulation routes), quiet spaces used for faith and neurodiversity purposes, assistance lounges, and all toilets (including in particular accessible and family toilets).

Excessive reverberation times should be designed out and eliminated. The spatial qualities of noisy areas, such as restaurants or areas where crowds are likely to gather, should minimise the build up and generation of noise. If the acoustics of such spaces are poor, then noise can escalate in intensity as people raise their voices in an effort to be heard. It is therefore important to incorporate adequate sound absorption into finishes where noise might be generated and sound insulation into elements that segregate noise generating spaces from spaces that need to be quieter. Avoid specifying too many hard surfaces in areas where audio communication is important.

Due regard should also be given to noise that may arise from outside the station and how key sound-sensitive functions, such as where customers might seek assistance, are located in relating to entry points.

Sensory Environs
2.4 Acoustics

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2.4.3   Visual sense

Since people who are deaf or hard of hearing tend to rely on their visual sense much more, it is important that careful attention is given to sight lines and how people might keep an eye on visual information, but also maintain situational awareness in relation to their personal safety/security.

For example, sight lines in and out of waiting rooms are important. So too are locations where there could be hidden corners. Consequently, stairs and circulation that have a direct line of sight from one end to other are better than configurations that inhibit a direct line of sight.

Areas with distinctive acoustic qualities can be more easily interpreted and may assist partially sighted and blind people to navigate if they are able to memorise the sounds and acoustic qualities that relate to building layouts.

A strategic and consistent use of different wall or ceiling finishes can create subtle but helpful sound contrasts and can help indicate, for example, circulation routes, seating areas and different functional areas. Assistive listening such as localised amplification at ticket office screens and induction loop systems should be installed at counters, including reception counters in staff workplace buildings. Similarly, attention should also be given to hearing assistance in spaces where staff meetings take place.

Careful attention should also be given to the location of public address systems in relation to where people will need to converse, such as ticket and assistance counters.

Furthermore, particular attention should also be given to the intelligibility of station announcements and the combined effect of public address systems and the acoustic environment in which they are located. Locations should also be identified where localised induction loops are to be sighted, whereby people with hearing aids can also listen into announcements.

Standards Reference

Acoustics — Measurement of room acoustic parameters — Part 1: Performance spaces, 2009
ISO 3382-1

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 & 2

Sound systems equipment Part 16: Objective rating of speech intelligibility by speech transmission index
BS EN 60268-16

WELL v2 Building Standard
International WELL Building Institute Standards

Sensory Environs
2.5   Lighting

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Image 2.5 King's Cross railway station

2.5.1   Who and why

All passengers and staff need adequate light levels to use buildings, outdoors spaces and transition spaces easily and safely, however some people are more adversely affected by inadequate lighting, including people who are partially sighted and some people with neurodiverse conditions.

People who lip-read need adequate, even, and well-placed lighting (and sometimes shade) to read lip movements and facial expressions, so designs should enable/support people to lip-read in areas where people will communicate, such as staffed ticketing/information points and at ticket barriers which is a location where people commonly seek information. Other areas include retail, refreshment and waiting areas where people are likely to have conversations.

Daylight is usually the most favourable form of light. Sunlight is beneficial but in certain situations can cause issues. Artificial lighting nevertheless is required where daylight cannot be accessed and when the station and associated outdoor spaces are accessed after dark.

Lighting will interact with many other design elements such as architectural, interior and landscape design features, finishes, colours and tones. An overarching inclusive design aspiration for lighting is that it helps enable or support environments that are legible and clear for users and that feel and are safe.

Sensory Environs

2.5 Lighting

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Image 2.6 Birkenhead North Railway Station

2.5.2 Design considerations

Daylight illumination strategies and artificial lighting systems should be designed to maintain a level of illumination that is comfortable and provides a safe environment that is suitable for all people. Particular care also needs to be taken with regards to the impact of sunlight too. Particular attention should be paid to lighting in:

→ entrance/exit points

→ main circulation routes

→ places where people might/will interact with others

→ locations with written information

→ locations where personal safety is a potential or known concern.

The design, application and management of lighting provision should:

→ be in appropriate locations and be well-placed

→ provide an even spread of lighting and avoid pooling of light and creation of shadows

→ provide appropriate lighting levels and quality in the right locations

→ be glare-free

→ help surfaces to be glare-free and avoid reflection

→ avoid a situation where lighting casts a shadow where people need to navigate, especially on stairs

→ give rise to sufficient illuminance for the task in hand and the awareness of hazards, such as the location of platform edges.

Sensory Environs
2.5 Lighting

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Where needed, transitional lighting should be provided for areas such as entrance lobbies where there are changes in illumination levels between inside and outside spaces.

Artificial lighting for main circulation routes including platforms should be designed to achieve an illuminance at floor level of at least 100 lux measured horizontally at floor level, although due care should be given to the visibility of signals for train drivers within relevant locations/on and around platforms. Illumination should increase to 150 to 200 lux at steps and stairs.

Uplighting set within the ground or floors, mounted on bollards or on walls or set within spotlights should be avoided.

Appropriate lighting is also required to aid people's walking and wheeling on the horizontal plane to illuminate routes, steps, ramps and other key features on or near walking routes.

Glare, reflective surfaces, pools of light and dark, very high light levels, and floor lighting/uplighting can cause issues such as reduced visibility or other visual disturbance, which can affect people's ability to navigate, and safely walk or wheel. Reflective surfaces can also create glare and/or give the illusion of steps or other features which can be disorientating for partially sighted and other people.

Methods of controlling glare should be provided on south facing external glazing, particularly on staircases and circulation routes. Ticket counters and staffed information points should not back onto or face onto lighting features or large areas of external glazing, since people might experience glare and lip-readers might find it harder to read the faces of staff, or conversely customers/passengers if they are staff.

Other consideration in relation to sunlight include how sunlight interacts with people emerging at the top of stairs and escalators facing in the direction of low-level unshaded sun and how sunlight can interact with repetitive visual elements such as palisade fencing. Adverse effects can occur when people move past such fencing when sunlight casts through it. Similarly, shadows cast by such repetitive elements can also create visual noise on surfaces such as platforms and other horizontal and vertical surfaces.

The illuminance on interior surfaces, the quality of the lighting, good colour rendering and the avoidance of glare are key factors to be considered. Low-pressure sodium and coloured light should be avoided as this gives rise to poor colour rendering and consequential visibility.

LEDs should be specified so as to avoid adverse blue light output, and owing to their intense and point source output, be so positioned so as to avoid easily being seen within a person's field of view.

Activities that involve reading or operating equipment might require higher illuminance levels or dedicated task lighting, especially in areas used by staff.

NR Guidance Suite Reference

Lighting in Stations
NR/GN/CIV/200/08

Refer also to Section on Personal Safety, Suicide Prevention, Visual and Tonal Contrast, Surfaces, and Wayfinding.

Sensory Environs
2.6   Colour and tonal contrast

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2.6.1   Who and why

It is important to appreciate that the lack of tonal contrast or poor use of colour can be as equally disabling to partially sighted people as a flight of steps is to a wheelchair user. Similarly, the lack of cane detectable and tactile features can be disabling to blind people who have no or very limited sight.

To make an environment inclusive to a wide range of people it is important to consider how colour, visual and tonal contrast can help make layouts and physical features legible and clear, and aid ease of navigation, circulation and use. Meanwhile, consideration should be also given to how people understand an environment without use of colour or tonal contrast, which will be further expanded upon under the Wayfinding section of this manual.

The choice of colour and tone of adjacent materials and the associated impact that lighting has on colour and tone affects how people interact with spaces and how confident, safe and secure they feel when moving through an environment. Appropriate use of colour, visual and tonal contrast greatly assists people who are partially sighted or who have sight conditions such as colour blindness.

Nevertheless, of the two components, tone is the most important as this is the distinguishing feature when colour may be difficult for some people to perceive or distinguish.

Colour choices when used can however be important for some people with neurological needs or neurodiverse conditions who benefit from clarity about what is where and the purpose of different features. Even so, it is worth considering what can be distinguished without use of colour first, before resorting to colour.

Sight also has an important relationship with balance and people's body positioning and can therefore have an important relationship with mobility. Not only that, one's processing of what one sees can also be impacted by temporary circumstances affecting mobility, such as illness, injury or pregnancy.

The difference in light reflectance between colours, i.e., the difference in light and dark, or tonal contrast, is more recognisable to and useful for partially sighted people than necessarily the difference between the colours themselves. For example, yellow and black are not necessarily a more distinguishable combination than white and dark blue or the difference between a light and a dark tone.

When spaces and places are designed with adequate visual and tonal contrast it can increase the sense of well-being of partially sighted people and others, maximise people's ability to move around a space independently and reduce the effort required to use a space, service or feature.

Colour scheme selection is important for providing contrast between critical surfaces such as floor and walls, doors and walls, and other surfaces throughout station and workplace environments.

Maintaining adequate tonal contrast between adjacent surfaces is important when redecorating or rebranding a station. For example, when a Train Operating Company changes livery colours.
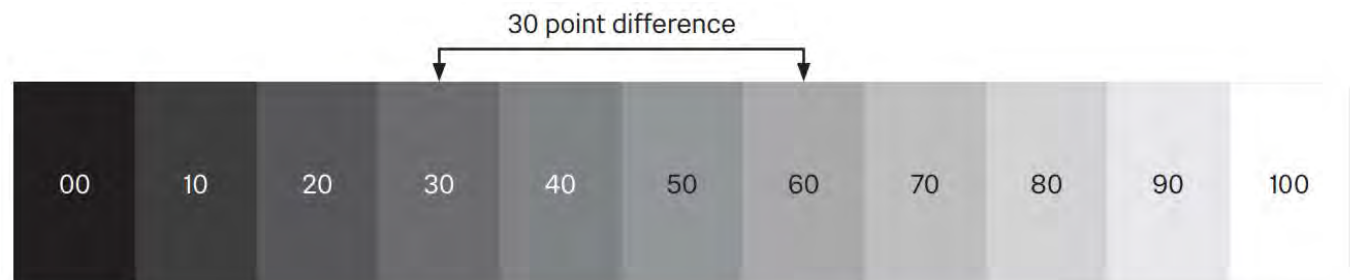

Image 2.7 Visual bar chart of tonal contrast percentage

Sensory Environs
2.6 Colour and tonal contrast

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2.6.2 Design considerations

Use light reflectance values (LRV) to determine the correct levels of contrast. Black has a value near but never quite 0. White has a value near but never quite 100.

To establish the appropriate colour palette of materials for a space, the Light Reflectance Value (LRV) of a material colour should be sought from the manufacture within the quoted colour notation, such as an RAL or BS number. Although there can be exceptions, generally the aim should be to achieve 30 points difference between distinct elements.

Colour schemes should be chosen that provide a luminance contrast between critical surfaces and their background/adjacent surfaces, and attention should be paid to the contrast between any features that help people to understand what is where and/or that have essential use functions, such as door handles.

Some examples of where contrast should be provided are between:

→ floors and walls
→ doors and walls
→ doors and surrounding fenestration
→ ironmongery and doors
→ sanitaryware and walls
→ stair nosings and stair treads and risers
→ handrails and adjacent walls.

→ switch and control plates should contrast with switches/controls, and with the wall that the plate is set on
→ signage and their backgrounds
→ text and their background
→ anything else one needs to be able to distinguish from its background/adjacency.

Particular note should be taken of entrances and doors within fenestration where more often than not designers do not create a visual contrast or even clearly identifiable entrance within a glazed configuration of an elevation.

Care should be taken to maintain adequate tonal contrast between adjacent surfaces when redecorating or rebranding a station. For example, when a TOC changes livery colours. Surfaces should have a matt finish or low sheen to avoid reflective glare, and floors and other surfaces should not be reflective, as when light reflects from surfaces they can be perceived as being slippery or can cause glare.

The use of busy, high contrasting geometric patterns should not be used as this can create aggravating effects for some people with neurological needs or neurodiverse conditions, people with mobility difficulties and/or aids who should need to focus on their balance and placing their feet, as well as people who are partially sighted.

Image 2.8 Bank station extension

Standards Reference
Design For The Mind - Neurodiversity and the Built Environment - Guide
PAS 6463:2022
Design of An Accessible and Inclusive Built Environment
BS 8300-1 & 2

Sensory Environs
2.6 Colour and tonal contrast

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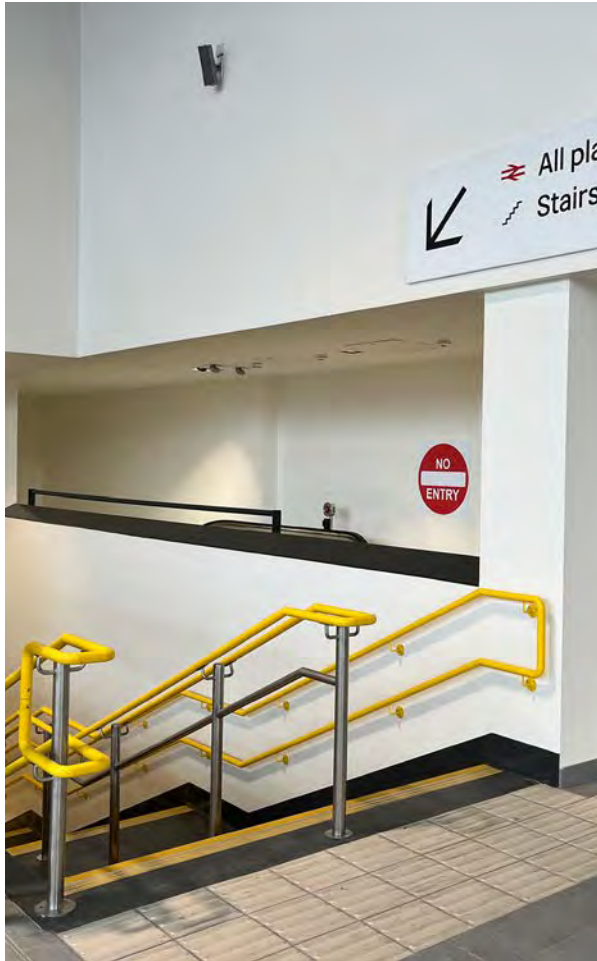300 Series
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Image 2.9 Stairs down to platform level at Sunderland station

For example, the use of contrasting bands and of areas of dark against light can be perceived as steps or a change in level if used on a floor. Sometimes people can have difficulty in perceiving depth where there is significant contrast on a floor surface and can perceive there to be hole where there is a dark surface on a light surface.

Regular perforated, dotted or striated patterns on floor, wall or ceiling patterns can also give rise to migraine, photosensory epilepsy and other adverse reactions to sensory overload. They have been known to affect people's balance and also cause people's sight to cut out altogether when their brain cannot cope with the visual signal it is trying to process.

Arguably, of the surfaces that are most critical, floors and walls where people are moving will likely have the greatest impact. Nevertheless, when one also takes into consideration that people often have to look up at signage, ceilings patterns can also have an adverse impact if it gives rise to visual noise.

Large areas of uninterrupted glazing should have manifestation (permanent marking) at two heights and in two tonally contrasting colours, contrasting with the background on either side of the glass. Refer to BS8300-2 for detailed requirements. Large mirrored floor to ceiling walls, as typically found in some toilet areas, should be avoided as these too can give rise to visual confusion.

Appropriate use of colour, visual and tonal contrast should not significantly add to the cost of a new build or refurbishment project if carefully considered from the outset.

Refer also to Section on Glazed Screens and Balustrades, Handrails, Toilets, and Surfaces.

Sensory Environs
2.6 Colour and tonal contrast

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2.6.3 Worked example

Approach 1: Contrast between floor and skirting

Requires either floor or wall to be relatively dark, which may be difficult to achieve consistently across the station where wall finishes may be required to change

Contrast between wall and skirting
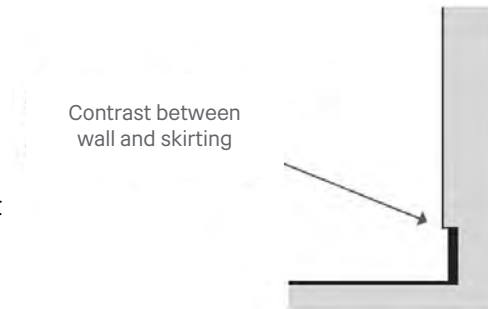
2.6.4 Worked example

Approach 2: Contrast between wall and skirting

Enables greater flexibility in the selection of wall and floor finish

Contrast between floor and skirting

Same LRV
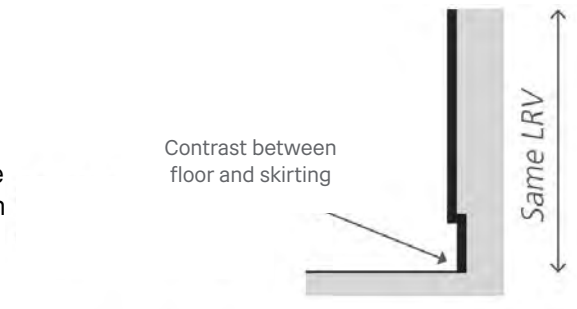
Image 2.10 Elizabeth Line, Canary Wharf station

Image 2.11 Jubilee Line Extension, Southwark station

Sensory Environs
2.7   Floor and surface finishes

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Image 2.12 London Bridge concourse

2.7.1   Who and why

Stations are one of the most demanding environments for surface finishes such as floors due to high passenger footfall; with large numbers of people moving through our stations it is important to assure everyone can do so safely. Floor design and specification should achieve robust, durable and slip-free surfaces that enable people to move through the station safely and easily.

Although floor surfaces are important for everyone, potential difficulties with use/negative impacts of poorly designed floor surfaces can be more significant for some people, such as: blind and partially sighted people; people with mobility difficulties and/or using walking aids; wheelchair users; older people; and people with temporary conditions such as illness, injury or pregnancy. Injuries to passengers resulting from slips, trips and falls are a serious issue with the potential to generate both claims and reputational damage to Network Rail and train operating companies (TOCs).

Changes in level should be easy for disabled people to negotiate, particularly people with mobility difficulties, and blind or partially sighted people. Even a single step can be a barrier to access or present a trip hazard for people with mobility or vision impairments, or who have buggies or luggage.

Floor finishes should provide adequate slip resistance and incorporate tactile and visually contrasting surfaces to indicate the presence of steps, ramps and level changes.

The visual nature of floor and other surfaces has the potential to cause visual disturbance and confusion for partially sighted people, those with neurodiverse conditions and also people with mobility impairments. Busy patterning and particular types of surface patterns such as banding can cause confusion about which surfaces/features are where and can have adverse impacts on some people. All floor and other surfaces should be evenly lit, glare-free, non-reflective and not shiny or glossy.

Floor surfaces with any type of artwork or patterns on can cause various issues, including visual disturbance and confusion. Floor surfaces with contrasting strips of colour can be mistaken for steps. Large sections of very light and dark floor surface can cause problems with depth perception, and therefore with people's foot/weight placement and balance.

NR Guidance Suite Reference

Lighting in Stations
NR/GN/CIV/200/08

Sensory Environs

2.7 Floor and surface finishes

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Image 2.13 Main concourse at Sunderland station

2.7.2   Design considerations

In the early stages of station planning, care should be taken to establish finished floor levels that provide step-free access between any station arrival areas and the platform, including arrival areas for Blue Badge users and community transport by taxi, public transport, walking and cycle parking.

Hard floor finishes in public areas should be robust, durable and designed for a minimum life of 20 years, without replacement or maintenance needed. Specification should confirm that a minimum slip resistance value (SRV) of 40 SRV is achieved.

On floor surfaces, the right balance should be achieved between slip resistance and ease of cleaning. Generally, the higher the slip resistance value, the more difficult the product is to clean as the surface is inevitably rougher, which has a detrimental effect on the floor's operational life. Materials like terrazzo or natural stone are typically able to provide suitable characteristics. However, the efficacy of slip resistance is significantly dependant on moisture and the extent to which moisture is removed from the underside of footwear. Consequently, barrier matting is very important.

Refer also to Section 3 Journey, Facilities and Platform.

Sensory Environs
2.7 Floor and surface finishes

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2.7.3 Matting and other floor finishes and fixtures

Barrier matting of adequate extent should be provided at entrance points so that floors remain dry and slip resistant. Typically, barrier matting is often insufficient for the context in which it is expected to work. It is most important that barrier matting is designed and specified to do the job that it needs to do.

Mat wells should be designed so matting is firm, securely fixed and flush with surrounding levels to avoid creating a trip hazard. Matting and carpets should have a shallow, dense, non-directional pile.

The design should also not incorporate a high contrast between brush and holders, as is often typical of some barrier matting designs, as this can generate visual noise and be especially problematic when some people endeavour to walk over such matting.

Attention should be given to flooring details at changes in level so that they incorporate tactile and visually contrasting surfaces to indicate the presence of steps, ramps and level changes.

Tactile paving surface on floors can assist blind or partially sighted people to avoid hazards and navigate large open spaces. Nevertheless, it is important that tactile surfaces are primarily used for warning and that for navigational purposes it is not overused as this can give rise to confusion, discomfort for those traversing over it, and — if used on or near platforms — can diminish the clarity of the warning surface.

For floors and other surfaces, designers should confirm that designs comply with current guidance and standards and provide adequate visual contrast in terms of light reflectance value (LRV). The visual aspect of indoor and outdoor floor or other surfaces should be carefully designed, using the guidance of an access consultant.

On floor and other surfaces:

→ high gloss finishes should not be specified as they can appear wet and therefore 'slippery.' They can also cause reflective glare

→ strong patterns should be avoided, and any patterns that are used should be carefully selected, located, and placed.

Surfaces should be glare-free, non-reflective and not shiny or glossy.

Refer also to Section on Colour and Tonal Contrast, Doors, Wayfinding, Entrances, and Lighting.

NR Guidance Suite Reference

Wayfinding Design Manual
NR/GN/CIV/300/01

Tactile Paving and Wayfinding
NR/GN/CIV/300/06

Standards Reference

Design For The Mind - Neurodiversity and the Built Environment - Guide
PAS 6463:2022

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 & 2

Sensory Environs
2.8 Public art

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Image 2.14 Great Western Railway unveils 6ft statue of Morph in Paddington

2.8.1 Who and why

Art can be permanent or temporary, and placed in or outside stations.

This section discusses 2D and 3D art that is fixed, whether temporary or permanent. It does not focus on art that has a live or performative element. However, temporary or live art will be substantially more the concern of Station Facilities Operators in terms of assuring that such provision is accessible, inclusive and addresses any potential hazards and risks that may arise. Designers, however, are encouraged to consider where temporary or live art might take place and most easily accommodated.

Public or civic art, and any associated interpretation should be able to be identified, enjoyed, and understood by as many people as possible, including blind and partially sighted people.

It is important to appreciate that medium or larger sized artworks can end up serving as local landmarks for orientation purposes and can be used as aids to identify meeting points, in which case, nearby/incorporated seating and other facilities such as maps could be considered, where appropriate. Paddington Bear and Isambard Brunel statues have become iconic and easily identifiable features of Paddington Station.

Moving artwork within a station can cause problems if people are reliant on such artwork to identify where they might meet others.

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2.8   Public art

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2.8.2   Design considerations:

As well as being accessible, artworks should not cause navigation, safety, or other issues for disabled or other people, including people who cannot see artworks.

To help make art accessible, the principle of designing for at least two senses could be followed. Multi-sensory design opportunities could be considered, such as visual, tactile, auditory and olfactory i.e., smell (whilst avoiding overwhelming people who can experience adverse impact from sensory stimulus).

As well as being accessible, art should avoid causing interference with people's visual and sensory processing, for example video screens and some types of patterning can cause visual noise issues for some people, and subsequent issues with functions such as people's vision and balance, and therefore with navigation and safe movement.

Art should not obstruct circulation routes and consideration should also be given to crowds that may form to view artworks that have become particular noteworthy.

Sculptures and their plinths, or other similar forms should:

→   Not present a trip hazard.

→   Should be cane-detectable at lower levels.

→   Should be guarded at upper heights where needed and there could be a risk of collision and people injuring themselves.

→   Consider the height of standing people, and children/wheelchair users/people of short stature, people who are blind or partially sighted, who have neurological needs.

Careful design and placement of art should avoid issues that can arise from glare, reflections, and some types of patterning. Further guidance on this is available in BS 8300-1, and in PAS 6463.

Interpretation should be available in accessible formats and should be available for appreciation of artwork. Attention will need to be given to safeguarding considerations that may be present within digital interpretation solutions, for example the risk of QR codes being misused.

Artwork in the form or floor markings should not be placed on any pedestrian, or other types of routes (cycle or vehicular), including at pedestrian crossing points, as this can cause navigation and mobility issues, and can cause confusion for people about the purpose of these surfaces and spaces.

Provision around or near artworks that enables or supports inclusive use, such as circulation routes, access to seating, and sight lines to key features such as signage and display screens, should be maintained at all times (or alternatives should be provided)

Image 2.15
Information desk

3

Journey, Facilities and Platform

Journey, Facilities and Platform
3.1 Blue Badge parking

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3.1.1 Who & why

It should be understood first and foremost that private vehicles used by Blue Badge holders are mobility aids. Not taking into account Blue Badge holders will be a barrier to some people as not catering for Blue Badge holders would be equivalent to asking individuals to leave their other more readily recognised mobility aids at home.

It might be assumed that people should use public transport or taxis, but the public transport and taxis are not always accessible/suitable to people's needs and this is one of the reasons why people become Blue Badge holders. The other assumption could also be that someone asks a family member to drop them off at a station but this assumption is equivalent to asking what enables a person to be independent, to become dependent on others and thus perpetuating what for some people is disabling.

The provision of Blue Badge or disabled parking bays is particularly important at stations with limited local public transport connections and should be provided close to the station's entrance. It is also important at stations that do have public transport, as not all public transport will not be accessible for many disabled or older people.

It should be borne in mind that not everyone who uses their vehicle as a mobility aid are Blue Badge holders. Similarly, people with young children often have a need for more spacious parking that is close to station destinations. It is therefore recommended that further thought is given to the location of parking for young families and those who have a need for more space and the associated additional transfer space often needed.

3.1.2 Design considerations

How parking spaces interface with pedestrian areas and their relative location to vehicle movements are also important and these factors will have a significant bearing on safety. For example, some people use rear access ramps and ideally need to lower these ramps directly onto a pedestrian area rather than be expected to lower the ramps down into path of other vehicles in the car park. This can become especially hazardous where there are bus movements and where vehicles are likely to overtake parked buses.

It can often be challenging to get in and out of vehicles in rainy weather without getting oneself and the wheelchair wet. It is therefore significantly beneficial if Blue Badge bays can be located under cover.

It is increasingly likely that Blue Badge holders will be driving electric vehicles and will need to charge their vehicle using trickle chargers whilst they are using the train. As such, Blue Badge bays will need to account for the additional space needed in order to achieve an acceptable level of accessibility whilst using charging equipment.

Accessible routes for Blue Badge users should be provided into and out of the station and are also important for enabling Blue Badge users to access nearby facilities before or after using a station, for example shops, a dog spending area or a plaza.

Car parks can potentially be places where people might become particularly vulnerable in terms of their personal safety/security. As such many of the considerations outlined in Section 1.3 will be relevant.

The Code of Practice Design Standards for Accessible Railway Stations includes detailed requirements for accessible parking and should be the first reference point for the design of Blue Badge parking bays.

Standards Reference
Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 & 2

Journey, Facilities and Platform
3.1 Blue Badge Parking

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Where general parking is provided, Blue Badge parking bays should be provided for disabled passengers. It is often advantageous if Blue Badge parking is available on either side of the station as this can significantly shorten and simplify some parts of a journey for some users when they may otherwise find that they are experiencing higher levels of fatigue, such as towards the end of the day on a return journey.

Blue Badge parking spaces should normally make up a minimum of 5% of the total car park capacity with a minimum of 1 space. If all designated Blue Badge spaces are occupied for more than 10% of the car park's operating hours, the operator should consider increasing their number. Future proofing of the design and operational plans should allow for the increasing Blue Badge Parking provision by a further 5%.

If there is no general parking, efforts should be put into providing some Blue Badge parking at least. It is also wise to undertake demand analysis to determine the anticipated quantity of provision that would be necessary.

Where extensive general parking is provided, such as at Parkway and Park and Ride stations, then there might be cases where the resulting extent of blue badge parking might exceed demand. Whilst future proofing amounting to quantity of provision based on percentages should be always factored in, it might, in some circumstances, be reasonable to defer marking some bays as Blue Badge parking and to determine a projected demand based on demand analysis.

The benefit of this could be to reduce distance travelled by others seeking to get close to the station entrance who have accessibility needs but are not Blue Badge holders.

In very exceptional circumstances, such as in tight inner-urban areas it might be very difficult to accommodate Blue Badge provision. However strenuous effort should be put into identifying where local accessible public parking might be found and the ease of movement to and from public parking.

Where no on-site Blue Badge parking provision is practically achievable, then in addition to identifying local accessible public parking, it is recommended that dynamic demand-responsive transport is considered that serves a geographic area and could be used to shuttle people to and from other local arrival points or connect them to essential facilities such as places of interest, schools, universities, hospitals and other key locations.

Blue Badge parking should be part of an end-to-end experience that is safe, accessible and comfortable for users with a wide range of disabilities. Blue Badge parking needs to be well-located and well-designed.

Blue Badge parking should be close to and substantially level with the principal station entrance. Access routes should ideally be short and on level ground should have resting places not more than 50m apart for people with limited mobility.

Image 3.1 Blue badge parking sign

Image 3.2 Blue Badge parking spaces at Hassocks station

Journey, Facilities and Platform
3.1 Blue Badge parking

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Where this is not possible, it is important that appropriately designed vertical circulation is designed and that resting places are provided en route. Ideally, at least some Blue Badge parking should enable those using rear access ramps to reverse up to a pedestrian area and deploy their ramp onto the pedestrian area, rather than the domain of vehicles.

In many cases, undertaking user engagement and consultation will be necessary/useful in order for designers and operators to appreciate the practicalities of getting in and out of vehicles and transitioning to trains.

The location of Blue Badge bays should be signposted from the station entrance(s) to the car park, or bay location(s) if they are not within a car park. Designers should also assess the need for signage and accessible pedestrian routes to other nearby places and facilities that Blue Badge users may need to use, such as the plaza, a dog spending area and shops.

Means of transferring onto pedestrian areas should be carefully thought through and careful consideration should be given to the different means or methods people use to transfer in and out of their vehicles, either with or without mobility aids such as wheelchairs and walking aids.

3.1.3 Preferred dimensions

Blue Badge parking spaces should be at least 2400mm x 4800mm with a hatched zone 1200mm to both sides and to the rear of the bay.

Ideally at least one larger parking space should be provided, 4800mm wide x 8000mm long, to accommodate adapted vehicles with side or rear access using hoists or ramps. However, means of deploying rear access ramps directly onto pedestrian realms are preferable. Larger bays also offer greater scope for the use of accessible minibuses.

Designers and station facility operators should explore opportunities for providing at least some Blue Badge parking under cover or under canopies and ideally providing a weather protected route to and from such bays.

Blue Badge parking areas should have a help point, particularly in large stations, where people can notify station staff that they have arrived so they can receive staff assistance if needed. Car parking layouts and detailing should be visually clear in terms of tonal and colour contrast and be well lit not only to enable ease of navigation but also to provide for better personal safety and security. CCTV should also be present.

Designated on-street disabled parking spaces, parallel to the kerb, should be 6600mm long × 3600mm wide, this helps to provide safe access off the carriageway and to the rear of the vehicle.

All blue badge spaces should be provided with Electric Vehicle (EV) charging points, in locations where EV charging is available. Consideration will need to be given to the appropriate, location, layout, charging type, and ergonomics.
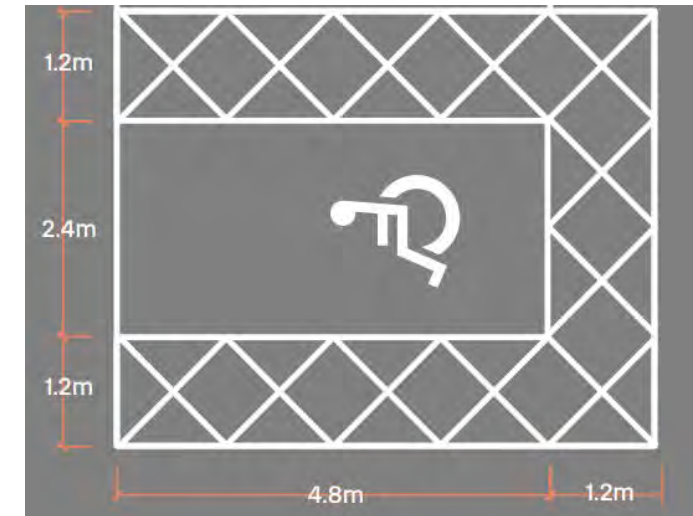

Image 3.3 Standard blue badge parking space

Standards Reference

Electric Vehicle Charging Points and Associated Infrastructure
NR/L2/CIV/902

Electric Vehicles Accessible Charging
PAS 1899:2022

NR Guidance Suite Reference

Parking & Mobility at Stations Design Manual
NR/GN/CIV/200/11

Electric Vehicle Charging Points & Associated Infrastructure
NR/GN/CIV/200/13

Journey, Facilities and Platform

3.2 Cycle and vehicle arrival / departure points

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3.2.1   Who & why

People might arrive at and depart from stations by walking, wheeling, cycling (personal or hired cycle), buses, tram, ferry, taxis, private car, coach, or community transport. The design considerations for walking and pedestrian routes are discussed within various other sections of this manual, and Blue Badge (disabled) car parking is discussed in Section 3.1.

Some cyclists are disabled, and can often use their cycle as a mobility aid. Accessible cycle parking is therefore needed at convenient locations and close to station entrances, or within stations.

Some disabled and older people rely on taxis and private cars for their journeys to and from stations, as bus stops are often too far from home or other destination points to be a viable transport option. It is often the connection from the station forecourt or plaza area that is the most problematic part of their journey.

Travel distances between set-down/pick-up points and station entrances and other key routes/ facilities should be as short and direct as possible, on step-free routes, and have seating and/or rest points in appropriate locations and at least every 50m. It is also important to apply these principles to accessible cycle parking locations.

All arrival and departure points should work well from a personal safety/security perspective. They should be designed and managed to help people be and feel as safe and comfortable as possible when arriving and leaving stations and when waiting at arrival locations, for example when waiting for station staff passenger assistance, a taxi/bus etc., or waiting for companions to arrive.

It is important to appreciate that some people arriving and departing may not qualify for a Blue Badge, but may nevertheless have other accessibility needs, such as old people and parents with small children/prams or luggage. These can present a risk to blind and partially sighted people and other people who might trip and fall over them.
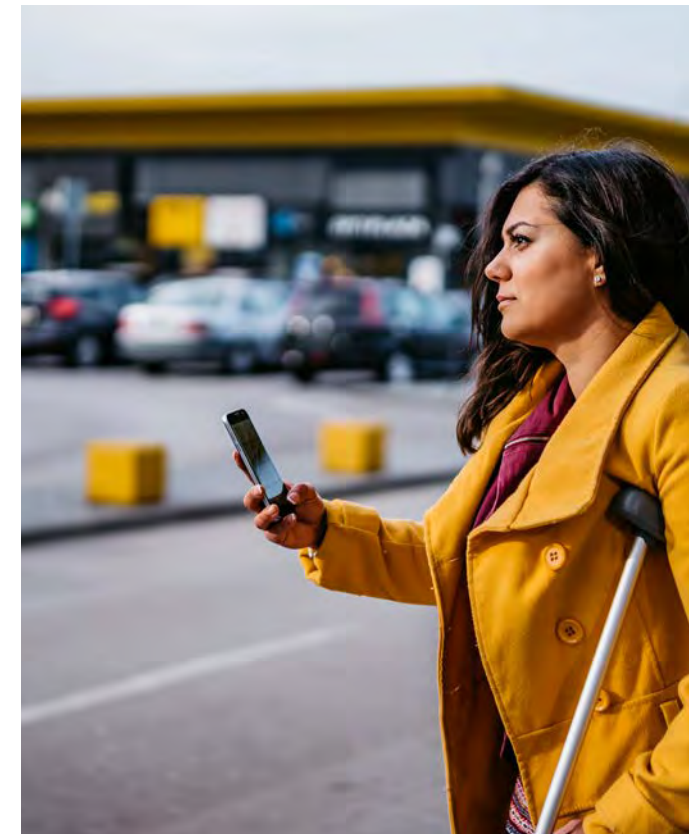

Image 3.4 Woman with crutches calling Crowdsourced taxi

NR Guidance Suite Reference

Parking and Mobility at Stations
NR/GN/CIV/200/11

Journey, Facilities and Platform
3.2 Cycle and vehicle arrival / departure points

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Image 3.5 Cycle Hub for Greater Manchester

3.2.2 Design considerations

The location of any cycle hire docking stations intended to serve station users should be in accessible locations and have convenient and direct connections to level access/step-free routes into and around stations.

A minimum of 5% of the cycle parking spaces that are provided should be accessible.

Signage/information should communicate the presence and location of accessible cycle racks, so that use can be prioritised for disabled or older people, or people with adapted cycles.

The capacity of the set-down/pick-up point(s) should be appropriate for the expected demand.

The location of the set-down/pick-up point should be as close as practical (ideally a maximum of 50m) to the principal station entrance(s). It should be on firm and level ground, and be clearly indicated on the approach to the station.

Consideration should also be given to accessible routes and connections to other nearby amenities that people may use as part of their journey, such as station plaza and associated facilities such as shops.

Journey, Facilities and Platform
3.2 Cycle and Vehicle Arrival / Departure Points

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It is often advantageous if arrival and departure points are available on either side of the station as this can significantly shorten and simplify some parts of a journey.

Ideally a short-term waiting area should be provided for drivers waiting for disabled or older passengers. This should be near, but not in the set-down/pick-up point. Set-down/pick-up points should be in locations that are not blocked by parked vehicles. A passenger shelter or waiting area should be included in view of the pick-up point with seating. It is significantly beneficial if arrival and departure points are located under or near to cover.

Set-down/pick-up points should be in locations that are not occupied by parked vehicles. Ideally a short-term waiting area should be provided for drivers waiting for disabled or older passengers near, but not in the set-down/pick-up point. A passenger waiting shelter with seating should be included in view of the pick-up point. It is significantly beneficial if arrival and departure points can be located under or near to overhead cover.

Dropped kerbs or flush kerbs should be provided in strategic locations to allow wheelchair users to move off the carriageway. However great care should be given to the siting of dropped and flush kerbs as blind and partially sighted people could easily walk out into the roadway without knowing that they are doing so and blister tactile paving is often not appropriate and can misdirect people into thinking there is a crossing.

Corduroy tactile paving in such locations might also be confusing and problematic for people with mobility difficulties. It is therefore preferable that, whilst being close to entrances, dropped kerbs and flush kerbs are not opposite entrances and the direction of pedestrian movement is in parallel.

Help points should be provided in strategic locations and at an accessible height to allow disabled, or other people to call for passenger assistance at stations where this service is available. Designers with involvement of station facilities operators need to make clear to passengers how to use help points, and which help point function to use to notify the station staff of their arrival/if they need other assistance.

Arrival and departure areas and their detailing should be visually clear in terms of tonal and colour contrast and be well lit to not only enable ease of navigation but also to provide for better personal safety and security. CCTV should also be present.

Relevant local and national guidance should be sought in relation to best practices around the designs of bus stops, ferry ports and tram halt designs, whilst also recognising that all types of arrival and departure points should be considered in inclusive design terms.

This is especially significant when considering the importance of enabling the accessibility and ease of intermodal transportation.

Refer also to Section on Help Points, Section 1 Assumptions Testing, Blue Badge Parking.

Standards Reference

Cycle Infrastructure Design
LTN 1/20

Journey, Facilities and Platform

3.3 Station approaches and plazas

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Image 3.6 King's Cross station, London

3.3.1 Who & why

Some stations will have little in the way of space for an external realm managed and operated as part of a station. Some stations will front onto a road, street and urban realms managed and operated by others. Some stations will present opportunities for placemaking, enhanced approaches and even plazas, whether operated as part of the station or by others.

In the early stages of design, it is important to apply a holistic approach to how people arrive and then approach a station. Initial planning will need to carefully consider the needs of people with a range of requirements to assure the site layout and design is functional and accessible for all.

Long distances, level changes and obstructions can make it difficult or impossible for some people to reach and enter stations. One of the eligibility criteria for having a Blue Badge pertains to whether someone can walk 50m without pain. Some people can manage no more than 50m without stopping for a rest. Mobility also varies between individuals and weather, topography, fluctuating pain levels and obstacles can also affect mobility ranges. Changes in level can cause problems for many people, particularly for those with mobility or vision impairments.

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3.3 Station approaches and plazas

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3.3.2 Design considerations

Approaches and plaza will need to accommodate diverse patterns of use, and local need may change over time, especially as redeveloped or new station approaches and plazas are embedded into and influence local place use.

The lack of delineation between vehicle, cycle and pedestrian routes can be confusing and hazardous for children, blind and partially sighted people, and/or have neurological conditions and mobility difficulties. This adds to confusion on the station approach, and presenting risk of people straying into, or getting stranded into areas where vehicles and cycles can be.

It is also important to consider that cyclists are pedestrians once they dismount their cycle, and that some cyclists have accessibility needs when both on and off their cycle. Some people use cycles as mobility aids and can't dismount cycle easily — routes in for cycles also need to work well in this respect. The information, guidance and methodology within the 'Testing Design Assumptions' section of this manual can be utilised for such assessment and urban design purposes.

For some people, the idea of a plaza can, in their mind, present a barrier across which to move and navigate. The reason is that plazas can present difficulties for people who find long distances difficult or need a means of navigating across or around such spaces.

Single, double, and tapered steps are often difficult for people to identify and present both trip and fall hazards.

Terraced and amphitheatre seating can present a serious risk of people falling. This is because people perceive this type of seating to be steps. No such terracing should feature within an urban realm unless there are means of preventing people from walking out over them from above.

There is often a temptation for urban designers to come up with designs that incorporate strong patterning in the form of bands of alternating colour tones of paving or dappled/variegated paving set/block/slab mixes. These patterns can create visual confusion and/or visual noise.

For, example it is not uncommon for alternating bands of colour tones to appear as though they are steps or for visual noise of paving patterns to interfere with people's balance, movement, navigation and/or welling.

Some people with neurological conditions may prefer quieter seating away from crowds, and some people might prefer seating in busier areas for personal safety reasons. Outdoors spaces will be used to some people to smoke and people will have a range of needs in relation to this, such as needing to sit to smoke, or needing to sit away from smoke for health reasons.


Image 3.7 Urban design in front of the station

The identification of potential hazards is important and should be assessed in relation to a range of persona narratives and scenarios. Hazards might include steps or ramps, loading/unloading activities, retail deliveries and trolleys etc, features placed in or near external routes such as security features. This is particularly important for blind or partially sighted people.

People who are blind or partially sighted vision often rely on a change in level (most often a kerb), other edges and tonal contrast between carriageway and footway to understand where it is safe to walk or wait, and where it is not.

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3.3 Station approaches and plazas
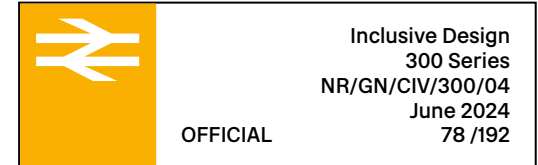
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The lack of delineation between vehicle, cycle and pedestrian routes can be confusing and hazardous for children, blind , partially sighted people, and people with neurological conditions and mobility difficulties. It is therefore important to avoid confusion on the station approach, and to consider the risk of pedestrians straying into areas where vehicles and cycles circulate.

In all situations, project sponsors and designers are encouraged to consider how all approaches, especially pedestrian approaches, be enhanced in order to create a sense of place. This may involve local partnerships and working collaboratively with others, whether public or private sector.

In some cases, external realms will simply consist of approaches, accommodating access routes to and from points of arrival and departure. In other situations, the external urban realm will consist of a forecourt area in which you might find car parking, cycle parking, taxi, community transport and private vehicle pick-up and setting-down facilities, bus stops, coach stops, tram stops and even ferry stops. In some situations, there will be an opportunity to create one or more plazas.

Careful consideration will be needed to shorten access routes from modes of arrival and, where possible, avoid placing any plazas between key points of arrival and entrances. Where extensive plazas are provided, designers are always encouraged to consider alternative points of arrival in order to reduce distances where plazas might otherwise extend access routes.

Routes from all arrival mode points should be as short and direct as possible and ideally a maximum of 50m. Where longer routes are unavoidable, accessible seating should be provided at regular intervals, at least every 50m. Designers should also incorporate routes that connect to adjacent facilities and areas.

The station should be connected to the surrounding urban context through local transport networks, cycle routes and pedestrian corridors. The urban realm should form part of the station design and be a contextual response to the unique qualities of the site.

Station approaches should provide direct access to travel interchange facilities and active travel routes and interfaces.

Active frontages, other activity, lighting, management, and assistance are factors that should be considered when commissioning and designing approaches and plazas.

Plazas should accommodate a variety of functions and features, including accessible cycle parking, as well as accessible and inclusive ways for people to orientate themselves. Meeting points are useful, and landmarks can serve this function. Accessible public seating is essential, and ideally near any help points that are provided. At some stations, sheltered seating may be important for ease of arrival and to offer people a choice of rest spots.

Whenever possible, trees should be planted in plazas to provide shade and improve environmental quality of the space. Immediately outside the principal entrances generous pedestrian plazas provide opportunities for activities including mobility hubs, kiosks, cafés, shops, pop-up retail, group gathering spots, performances, and play or child-friendly features. These amenities should support placemaking and help make the station a destination for the local community.

Bus, tram, ferry, taxi, private vehicle/community transport set-down/pick-up points, and accessible vehicle and cycle parking should be close to a clearly identifiable station entrance so that interchange travel distances are minimised.

Designers should separate vehicle and cycle access from pedestrian routes and areas, so the are safe for a range of people to use, especially blind and partially sighted people. Shared pedestrian/cycle and pedestrian/vehicle surfaces should not enter into the realm of a station owing to there being too great a risk of collision.

Design of landmarks and meeting points, and their surrounding public realm should enable them to be found and identified by blind or partially sighted people. They should be in convenient locations, have good passive surveillance and ideally have seating close by.

Journey, Facilities and Platform
3.3 Station approaches and plazas

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3.3.3 Sight lines and furniture

There should be clear views of entrance(s) when approaching the station. The principal entrances should be clearly expressed by the architecture to aide intuitive wayfinding, with other public realm wayfinding solutions for blind and partially sighted people and those who would benefit from cane detectable, tactile and digitally-enabled audible wayfinding information.

The design and selection of materials and finishes in the urban realm should follow the principles and requirements set out in the Sensory Environs section of this manual, whilst meeting operational demands. Particular care should be taken to avoid causing visual confusion and/or visual noise.

Routes should be clear, clutter-free and clearly defined within the landscape, with features such as street furniture, cycle stands, and café seating being placed out of circulation routes. Areas with café seating or similar will need a cane-detectable edge to avoid presenting a hazard to people who are blind or partially sighted, and designers need to consider spatial needs for this at an early stage.

Street furniture and landscape features should not form a barrier to free movement of pedestrians and should be located off routes and grouped together wherever possible. In general, street furniture should be designed so that people do not trip and fall over.

Typically, hazardous features include low level narrow seats with no back rests, low level walls with no soft landscaping/planting retained behind or low level folders in circulation routes. Free-standing items of furniture, such as bollards and bins should be 1000mm minimum in height.

All street furniture and features should tonally contrast with their background and columns should have bands of a contrasting tone at 1000mm and 1500mm centres as appropriate.

As well as good design, the management of external routes will be needed so that routes remain clear; designers and station managers should consider the permanent and temporary features and activities that may affect clear routes, such as seating, and operational and retail activities.

Steps should be avoided except as an alternative to ramps, lifts and escalators. Where they are considered necessary, single, double and tapered steps should be not be utilised. All steps should feature corduroy tactile warnings.

The design and configuration of horizontal and vertical circulation should follow the guidance in the Horizontal circulation and Vertical circulation sections of this manual.

Public seating should meet inclusive design good practice guidance, and seating for people to sit opposite each other is beneficial for people who need to use sign language and/or lip-read.

Materials and finishes should be robust, hard wearing, even, slip resistant and provide visual and tonal contrast between distinct elements that need to be navigated past and/or around.

Any fountains or water features need to be identifiable for blind and partially sighted people, and people with neurological conditions. Water features should not present trip, slip or drenching hazards. How fountains behave in the wind should also be considered.

Image 3.8 Water feature in the plaza

NR Guidance Suite Reference

Public Realm Design Guidance For Stations
NR/GN/CIV/200/10

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3.3 Station approaches and plazas

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Image 3.9 New forecourt at slough station

3.3.4 Lighting, routing, greenery and security

External lighting and wayfinding should be provided to help all people, including people with auditory, visual and neurological conditions, find their way into the station. Help points should also be available. Lighting should not give rise to glare or visual noise and the placing of light sources should not be visible in people's principal field of view and thereby interfere with people's ability to see where they are going.

Any external routes that lead to facilities such as dog spending and cycle parking need to be accessible. It should be borne in mind that people with assistance dogs may be arriving by walking, public transport or at parking/drop-off points.

Security requirements to combat terrorist attacks can present some tensions with inclusive design in the urban realm, such as placement of bollards in less than desirable locations in or near pedestrian routes. Designers should have an awareness of these issues and seek guidance from an access consultant whilst developing security measures.

Refer also to Section on Various sensory environs, External Ramps, External Steps, Arrival Wayfinding, Seating, Help Points, Lighting.

NR Guidance Suite Reference

Security at Stations
NR/GN/CIV/300/02

Journey, Facilities and Platform
3.4 Station entrance

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Image 3.10 Euston station entrance

3.4.1 Who and why

Railway stations can be large, complex buildings. The location and presence of entrances needs to be clear, particularly for blind or partially sighted people, people with neurodiverse conditions and people who are unfamiliar with UK rail stations such as some tourists.

Disabled people and other people who need journey assistance might arrive at a station by walking, cycling, public transport, or in a private vehicle or taxi. Under current railway undertakings station managers, ticket vendors and tour operators are required to provide assistance to those who have a need for assistance and this might need to be prior to someone entering the station.

UK station types include smaller 'platform-only' stations, historic buildings, and modern stations such as Birmingham New Street station. People's concept and understanding of what a station is and looks like might affect their understanding of where entrances will be.

Journey, Facilities and Platform
3.4 Station entrance

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Image 3.11 Kings Cross station, London

3.4.2 Design considerations

Station managers or any other authorised person should designate points, within and outside stations, at which people requiring assistance can announce their arrival and, if required, request assistance. The locations at which people can announce their arrival to station staff need to account for this and enable people to announce their arrival/seek assistance either in person or at a help point.

Areas around station entrances should be kept clear of clutter such as street furniture, advertising boards and bicycle racks which can create obstacles for people with blind and partially sighted people. Designers should assess spatial needs and layouts for any such features at an early stage so they are placed out of entrances and circulation routes.

Wayfinding from all types of arrival and modal interchange points should help people understand where station entrances are, and branding and clear signage and information are important for this.

Many stations will have multiple entrances and sometimes other facilities such as retail near entrances. These need to be distinguishable from entrances and ideally less prominent than entrances so as not to cause confusion about where entrances are.

Entrance area sightliness should be clear and should enable people's intuitive understanding of any station concourse area, locations of facilities and passenger movements.

Journey, Facilities and Platform
3.4 Station entrance

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3.4.3 Entrance considerations

Station entrances should have strong visual connections with the surrounding urban realm to aid intuitive wayfinding. This can be achieved through glazed façades that provide sight lines into the station building. However, doors and openings themselves should not be lost within such façades. The architecture, articulation, visuals and lighting of openings should enable them to be easily identified.

Entrance thresholds are an important interface between the internal and external built environment. At these points it is important that levels and materials are carefully considered to provide an accessible route. Care should be taken to provide adequate weather protection with a canopy, and sufficiently sized barrier mats to prevent floor finishes becoming slippery.

Transitional lighting is important at station entrances for people whose vision cannot easily adjust to changes in light.

Entrance matting is important for maintaining slip-free and safe environments in stations, however visually noisy patterning in the form of highly contrasting brushes and holders should be avoided.

Principal entrance(s) should be clearly expressed by the architecture to aide intuitive wayfinding, with other wayfinding solutions found for blind and partially sighted people who would benefit from audible and tactile wayfinding information.

Volumetric design should provide good sight lines between the station entrances, concourse and platform areas to provide an intuitive understanding of station layout, facilities and passenger movement.

The primary entrance should be accessed from any station plaza and be clearly defined with the station name and the National Rail double arrow, which is widely recognised and should be clearly visible ahead of, and at all station entrances.

Secondary entrances should provide convenient access from any car parks, Blue Badge parking, drop-off and pick-up points, public transport connections/stops, cycle parking/cycle hire and mobility hubs to reduce travel distances for older and disabled people.

Doors should be generous enough to allow groups of people to pass through, and entrances should have adequate waiting/circulation space on both sides, as is needed for each location. Space is needed for groups including families, school or tourist groups, peak flow movement, wheelchair users, and people with children, prams, luggage, mobility aids and cycles.

Entrance doors should open automatically to assist wheelchair users, people with mobility difficulties, blind and partially sighted people and passengers with prams, luggage or bicycles.

Revolving doors with pass doors do not usually work well and should be avoided. The positioning and set up of doors should prevent any detection of movement to trigger being caused by people passing and not entering the station.

Deliveries should ideally be kept separate from passenger entrances at peak use times/in all hours.

Refer also to Section on Floor and other surfaces, Doors and Ironmongery, Lighting, Wayfinding, and Circulation.

Standards Reference

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 and 2

NR Guidance Suite Reference

Rail Symbol 2
NR/GN/CIV/300/05

Journey, Facilities and Platform
3.5 Horizontal circulation

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Image 3.12 Couple finding a taxi after leaving the train station

3.5.1 Who and why

Horizontal circulation along with vertical circulation are the means by which people enter, move about and leave a station environment. Factors like width, gradient, evenness, slip resistance, visual clarity all have an impact on how people move, pass one another, the energy they use, their balance and their navigation.

Typically, disabled and older people wish to travel independently but can find some station environments overly complex, busy, noisy and stressful and difficult to negotiate. Some people with sight, hearing and/or neurological conditions in particular can find navigation difficult.

For example, identifying signage and customer information system (CIS) screens amongst visual clutter such as retail advertising. The simpler the station configuration the better. Ticket control barriers present additional complexity, dividing horizontal circulation, such as concourses, into paid and unpaid areas.

A lack of a coherent strategic wayfinding strategy and poorly organised and designed signage can further hinder people's progress through a station.

Blind and partially sighted people can find it difficult to avoid columns and free-standing objects such as seating and when objects lack tonal contrast with their background, they are harder for partially sighted and other people to identify.

Journey, Facilities and Platform
3.5   Horizontal circulation

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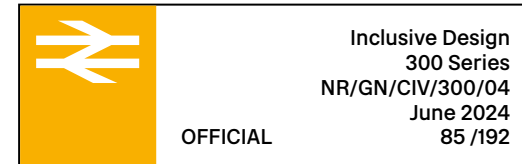
Pedestrian flow analysis is often necessary in order to anticipate the capacity of horizontal circulation and associated vertical circulation. Crowds can have an impact on the ease of movement of people, the time it takes for people to clear an area, the level of anxiety that passengers may have and ultimately the safety of both passengers and staff. Overcrowding can occur in circulation that is not alongside platform edges but can be made even more hazardous in such situations. Pinch points can further add to the risk of crushing and falls. Additional complexity and lack of clarity further adds to the risk of people slowing down or moving in unexpected directions and thereby potentially leading to collisions and falls.

People with mobility difficulties, including some wheelchair users, often struggle with long travel distances between station arrival points, other station facilities and boarding their train. Platform interchange travel distances can also be challenging for older people, and people with mobility difficulties. Clutter-free circulation routes, seating at regular intervals and an effective assistance service help people to reach station facilities and platforms more easily.

Strategically located overbridges, underpasses, lifts, steps, ramps and good wayfinding provision is key for helping people to understand and take routes that are direct, short, and/or the most accessible for them, for example with a lift rather than stairs.

3.5.2   Visual noise

The noise levels within stations, although generally unavoidable, can block out important audible information such as public address (PA) information that some people are relying on when they cannot see where they are going, and add to people's stress levels. As well as passenger movement, rail and retail staff move through stations using horizontal circulation and associated vertical circulation, sometimes with retail deliveries, cleaning trolleys and resources and passenger assistance buggies for passengers with disabilities or mobility needs.

While the use of floor-based tactile wayfinding systems may assist blind or partially sighted people to orientate themselves and navigate large open spaces such as station concourses, these may have drawbacks and their application should be carefully considered, as they have the potential to cause confusion if not applied appropriately and may be unfamiliar for many UK-based passengers.

An example of something that can give rise to significant visual noise is palisade fencing, especially when combined with sunlight or walls/cladding consisting of strong alternating colours/tones. Such patterns are known to give rise to migraines, photo-sensory epilepsy and to cause people to experience other forms of sensory overload which can lead to some people having greater difficulty maintaining balance, walking, or even to people's sight closing down to avoid a person's brain being bombarded by the impact of the pattern.

3.5.3   Design considerations

Step-free options should always be available and be the shortest and most direct routes. Stepped alternatives should also be available where there are level changes greater than 300mm and gradients are steeper than 1 in 20.

Intermodal connectivity should be as seamless as possible for mixed mode commuting from national rail to metro, underground systems and other modes of onward travel including walking, cycle, bus, coach and taxi.

Passenger routes should be as short, simple and direct as possible. Consideration should be given to how continuity of routes can aid circulation, where appropriate. An effective passenger assistance service can assist people greatly with reaching platforms and other station facilities.

Resting points should be provided at regular 50m intervals on main circulation routes so that passengers do not have to travel far to find a seat. In some scenarios where routes may be considered especially strenuous or where expected numbers of passengers may be greater, then more regular seating is advised.

The obstacle-free route requirement, as set out in PRM NTSN, is 1600mm. Although this is the minimum, in practice designers should utilise a minimum with of 2000mm on horizontal sections of routes.

Journey, Facilities and Platform
3.5 Horizontal circulation

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Image 3.13 Commuters shopping

Where there are constrictions, designers should also take into account the need for people to pass one another and also, where relevant, obtain specialist pedestrian flow analysis in order to determine any increase in widths of horizontal circulation necessary.

The concourse should be a generous volume. It should be a flexible, inclusive environment that can hold and host social and amenity facilities for passengers and local communities. Volumetric design should provide good sight-lines between the station entrances, concourse and platform areas to help provide an intuitive understanding of the station's facilities and passenger movement. Inclusive design principles should be applied during concept design to create simple internal volumes and direct passenger routes with step-free access.

An exercise should be undertaken to help assess accessibility issues that passengers face on their end-to-end journeys, and in and around stations. To consider a relevant range of user needs, refer to the range of persona narratives and scenarios, and other considerations that are discussed within the testing design assumptions section within this manual.

Passenger routes should be overlaid with passenger facilities and operational requirements to gain a full understanding of access issues.

Journey, Facilities and Platform
3.5   Horizontal circulation

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In addition to and as part of undertaking the above exercises, attention should be paid to the following key design considerations:

→   wayfinding and signage should be clear

→   telephones, vending machines and seating should be grouped together off the circulation space

→   customer information systems (CIS) and wayfinding decision points should be located to avoid obstructing circulation routes

→   wide span roof structures should be considered to reduce the number of columns located within the station concourse and columns should be positioned to facilitate passenger routes and avoid obstructions

→   necessary free-standing items such as columns should have adequate tonal contrast with the floor colour and the background they are seen against. They should also incorporate a 150mm wide tonally contrasting band with the bottom edge at 1500mm above the floor

→   bollards should only be used where absolutely necessary. These should be a minimum of 1000 mm high and designed to be easily identified from their background

→   where low level rails are required to protect the building fabric their impact on the effective clear width of routes, lifts and other areas should be considered. For example, rails located in lift lobbies below lift controls can block access to the controls, and rails within lifts can reduce the effective size of the lift. In some situations if they protrude too much they could cause people to topple sideways if they catch their heals on them.

In some circumstances travelators may be necessary in order to enable people to travel longer distances.

However, alternative walking routes combined with passenger assistance vehicles are likely to be necessary as travelators are not suited to everybody's needs. It may even be that some form of road- or track-based shuttle is necessary should the overall length of routes be such where they are more appropriate than travelators, which usually need to be enclosed and not outdoors.

Possibilities for complementary digital solutions should also be evaluated, such as smartphone/audio-based wayfinding systems, however digital solutions should always be one of a number of solutions, rather than being regarded as a single solution for any potential accessibility issue. Preference should always be given to identifying means by which the design enables and features cane-detectable route edges.

Image 3.14 New passenger assistance buggy on platform at London Euston

Standards Reference

Persons of Reduced Mobility NTSN
PRM NTSN

NR Guidance Suite Reference

Vertical Circulation Design Manual
NR/GN/CIV/200/05

Tactile Paving and Wayfinding
NR/GN/CIV/300/06

Journey, Facilities and Platform
3.6 Vertical circulation, bridges and underpasses

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3.6.1   Strategic context

A common factor and intent of vertical circulation, bridges and underpasses is to address what would otherwise be a barrier to access and as such they form an essential part of enabling access and providing an inclusive station environment.

Apart from some termini stations and some very simple one-platform stations vertical circulation is an almost inescapable feature of most stations since one usually needs elements of vertical circulation when providing means of crossing from one platform to another. Even where a station is a termini station, it is not uncommon that vertical circulation features in considerations pertaining to secondary means of escape or alternative means of access/departure.

Not only that, but there are also topographical considerations to take into account, even if a station is sited on a relatively level site. For example, unless tracks are lowered to beneath the level site, an element of vertical circulation is often needed to enable people to reach the platform level. Moreover, some station locations are sited on hillsides, below ground, in cuttings or on embankments and means of vertical circulation are often needed in order to negotiate level changes between points of arrival/departure and platform level(s).

For the most part, vertical circulation has implications for people with mobility difficulties, who might be using walking aids or wheelchairs and who might have underlying conditions affecting their heart or breathing.

However, vertical circulation can also pose challenges for people with luggage and people accompanied by children or blind or partially sighted people who may not find particular features and aspects of the vertical circulation easy to negotiate. Essentially the two main factors in vertical circulation are potential complexity, in terms of navigation and wayfinding, and the level of effort necessary to negotiate changes in level. Considerations pertaining to vertical circulation cannot be separated from the overall journey sequences of arrival, departure and interchange and the length of interconnecting horizontal circulation and the provision of resting places and seating, as these factors also have an impact on complexity and effort.

Vertical circulation should be located where it is convenient. Account should be taken of run-off zones at the top and bottom of ramps, stairs and escalators and horizontal circulation should designed so as to enable pedestrian flows to merge and not clash with these zones. Some, but not all people can make use of escalators.

Lifts are more usable for a wider range of people and needs and can help reduce travel distance for passengers with mobility difficulties including wheelchair users, people with cycles/luggage/prams/small children, blind and partially sighted people and other people who might benefit such as carers and their companions.

Lifts should be located where they are easy to find convenient, and placement should give greater or equal prominence to escalators to encourage passengers with accessibility requirements to use them. People waiting for lifts, and any objects or mobility aids they have with them should not obstruct circulation routes or general/crowd movement.

Vertical voids should be provided around vertical circulation to provide visual connections between levels, facilitating daylight penetration and assisting intuitive wayfinding. However, care should be given to reducing the potential impact on people experiencing vertigo, by not creating too much transparency to vertical elements of floor edge treatments.

Image 3.15 Hackney Wick walkway underpass

Journey, Facilities and Platform
3.6 Vertical circulation, bridges and underpasses

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3.6.2 Preferred and alternative means of negotiating level changes

From a user's perspective one usually starts with seeking to minimise effort. This usually means removing the need for vertical circulation wherever possible. If this cannot be achieved and for short vertical changes in level then gradual gradients gentler than 1:20 are preferable. If height and space don't allow then providing a height is not too great (usually less than 2m) then ramps are often preferred, but with alternative stepped access nearby. The reason for this is that some people find it easier negotiating steps than they do ramps. Where vertical changes of level are above 2m, the use of ramps is too demanding and lifts should be used to negotiate the vertical changes in level, on an accessible route.

3.6.3 Factors when considering lift use

From a maintenance and personal safety / security perspective lifts can potentially pose significant issues. The reason for this is that for some they can become places of antisocial behaviour (urination, drug use etc.), entrapment and/or crime. Consequently, it is most important to pay attention to means of addressing these issues.

This essentially means that lifts should be subject to high levels of maintenance, rapid repair response times and full time CCTV surveillance combined with public announcement access for those monitoring their use.

Where lifts are provided, alternative steps should always be provided and where possible it is always beneficial to consider what step-free routes are available to a lift in circumstances where a lift is out of order. This offers alternative options for people who have personal safety concerns or who could otherwise get stuck on a platform.

Those waiting for lifts or exiting lifts can be especially vulnerable to the movement of other people and lifts should therefore always have landings that are clear of nearby circulation routes. Lift landings will also need shelter from inclement weather and means of sitting/perching whilst people wait.

Visibility into and out of lifts through the use of glazing is beneficial to personal safety and how they orientate themselves. However, if glazing is provided, careful consideration should be given to addressing the risk of people experiencing vertigo. This may be mitigated by designing glazing which doesn't go down to lift car floor levels and stops at above handrail height.

Configuration and capacity of lifts are important and whilst there are minimum technical requirements for the sizing of lifts it is important that account is taken of demand, capacity, movement and use.

Through style lifts are preferred to lifts where entrance exit doors are not directly opposite one another. Where a lift isn't a through style lift, sufficient space is needed for people with wheeled mobility devices to manoeuvre and turn around, whilst also considering the presence of other people entering and leaving the lift.

Image 3.16 Crowborough access for all lift

Standards Reference

Standard Specification for New and Upgraded Lifts
NR/L2/CIV/193

Selection and Design of New and Upgraded Lifts
NR/L2/CIV/194

NR Guidance Suite Reference

Vertical Circulation Design Manual
NR/GN/CIV/200/05

Journey, Facilities and Platform

3.6 Vertical circulation, bridges and underpasses

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3.6.4 Escalators

Where there are high volumes of passenger movement onto and off platforms, or where level changes are so significant that stairs and lifts alone are insufficient, escalators are often necessary in order to move large volumes of people at a time. However, for some people with mobility difficulties, blind or partially sighted people or people who have some neurological conditions, escalators can be especially problematic. As such, there should always be stepped and lift alternatives.

3.6.5 Siting of vertical circulation

In terms of positioning lifts and on access routes it is always preferable to locate lifts before stairs and escalators. This shortens the distance travelled by those who have a need for lifts and encourages the use of lifts by people who could otherwise get into difficulty whilst attempting to negotiate stairs or escalators, whether with or without luggage. This might seem counterintuitive in terms of managing pedestrian flow volumes and therefore careful consideration also needs to be given to how people using other means of vertical circulation do so in the most straightforward manner possible.

As with lifts and the provision of lift landing spaces clear of circulation, the siting of steps and stairs needs to take account of people's movement and the space (both at the top and bottom) immediately in front of the vertical circulation. This is often referred to as run-off space and is important if one is to reduce the risk of people colliding with one another.

3.6.6 Means of crossing between platforms and associated safety

Careful consideration of both safety and prevention of attempts at death by suicide are necessary, however careful consideration is also needed of people's personal safety/security in terms of risks/threats presented by other people.

Within station environments, vertical circulation is often provided in conjunction with horizontal means of crossing from one platform to another. It is often seen as preferable to facilitate such crossings via the use of bridges as these are usually preferred to underpasses owing to perceived personal safety/security risks associated with subways. Even so, bridges, steps and ramps themselves also pose potential personal safety/security risks. The reason for this risk is that such crossing points are points of constriction.

Bridges can, if designed with visibility in mind, offer greater visibility onto and off the bridge deck. Care should nevertheless be given to means of mitigating against the risk of vertigo when considering how to optimise visibility and, wherever possible, limiting the extent of glazing below a typical waist/handrail height.

Following an investigation into the instances of falls at Bristol Parkway station, visibility from bridges and stairs down onto the platforms is thought to be an important factor when it comes to reducing the risk of people running and falling when they can hear train movement but can't see their train.

Incidents of trips and falls increase where there are short flights of steps and, as a consequence, very short one or two riser steps are not permitted.

Further improvements to personal safety/security on bridges and in underpasses can also be achieved by maintaining sight lines and avoiding changes in direction in the route that people have to take.

Nevertheless, CCTV (ideally with full time surveillance and public announcement access for those monitoring), is often necessary in order to offer greater reassurance to passengers and staff.

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3.6.7 Underpasses

Underpasses should feel safe and inclusive. Space in underpasses should be as wide and high as practicable, clear platform signage and headline destination information wayfinding should be provided, along with lifts directly from underpasses to platforms. Long corridors should be avoided and perch seating provided to aid those who may need to rest, whilst navigating the station.

3.6.8 Safeguarding passengers from weather

Means of shelter and protection from inclement weather poses an important consideration when considering means by which one crosses from one side of the tracks to another. Underpasses, provided that they are detailed adequately, usually offer inherent protection from weather but can also be at greater risk of flooding.

Weather protection above steps and bridge decks are also considered particularly desirable from a safety and inclusion perspective. Bridges and steps that are left exposed can potentially become wet and more susceptible to the build up of, water, snow and ice and thereby present a greater risk of slips, trips and falls.

It is also important to bear in mind that bridges, lifts and associated steps can potentially already form part of a significantly long route to and from platforms and people who are potentially slow-moving owing to mobility or sight difficulties can more easily get wet when it rains.

Not only that, people using wheelchairs have a much greater likelihood of not only getting wet when it rains but finding that they are sitting in wet wheelchairs for much longer periods of time owing to the exposure of legs and seats to precipitation.

Sometimes the argument may be put that canopies over bridge decks and steps encourages passengers to use steps and badges as shelter and hinder movement via them, or that the presence of shelter offered by such canopies can encourage the loitering of groups of people with no intent on travelling and thereby deterring others from using the station.

However, it is recommended that these issues are addressed through adequate siting and capacity of platform shelter provision. Loitering should be addressed through appropriate security provision and seeking to work with other agencies to address the underlying causes of loitering.

Regardless if footbridges are covered or not, any lift entrance should have a canopy or roof cover of at least 1.5 deep by 2.5m wide centred on the lift door which should be 1.1m wide. The slope of the floor should be away from the lift to prevent water seeping into the lift shaft.

Image 3.17 Ilford station lifts

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3.6.9   Vertical circulation within means of escape

Whenever considering vertical circulation and means of crossing from one platform to another it is also important to consider how vertical circulation features in means of escape, whilst not only utilising the primary means of access but alternative means of escape, such as from platform ends.

If at all possible it is preferable to utilise step-free means of escape that are not reliant on lifts. This is typically not possible where the vertical rise is above 2m which would exclude the use of ramps. In such cases the preferred approach is to specify the lifts with adequate controls that would allow its use for self-evacuation in case of fire.

Where there are two platforms it is often most ideal for the end of platforms on either side of the tracks to connect to the public realm and final means of escape via ramps, where level egress is not possible. Even so, some form of evacuation functionality may also be needed to enable those on a bridge to evacuate too.

In very exceptional circumstances and where all other options have been explored then means of crossing the tracks from where there are refuges/muster points, might include the use of level "barrow" crossings.

However, these should always be gated to prevent use during normal times of operation. When they are to be used during evacuation they should ideally be supervised by staff and be provided with both visual and audible means of communicating when it is safe to cross, which should be when all trains have been stopped as a result of an enfolding incident at the station.

Image 3.18 Waverly steps

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Image 3.19 London Bridge lift, steps and escalators

3.6.10 Strategy

Before anything else, the key question when considering station design would be to explore whether levels can be adjusted whereby at least some key points of arrival/departure (such as drop-off points, taxi and Blue Badge parking) can be placed at or near to the level of the principle/primary station platform.

Another key and strategic design consideration is positioning and sequencing of both vertical circulation and means of crossing from one platform to another. The simpler, more intuitive and straightforward the configuration of circulation the better.

Siting a location of vertical circulation (including lifts, bridges, and underpasses) should take into account pedestrian flow analysis, but always seek to place lifts prior to other means of vertical circulation. This is to shorten the distance travelled by those who have need of lifts but also to discourage those who might otherwise negotiate other means of vertical circulation and put themselves at risk whilst doing so.

Lifts and alternative means of vertical circulation should ideally be in close proximity from one another or at least clearly visible from the direction of approach, so that the alternative provision is clearly evident. At the very least wayfinding signage should direct passengers to alternative means of vertical circulation. In particular, signage should be located near to escalators directing people to lifts.

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3.6   Vertical circulation, bridges and underpasses

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3.6.11   Technical compliance

All vertical circulation and associated means of crossing from platform to platform should be designed and configured in accordance to not only the PRM NTSN requirements but also take into account the DfT COP 2015 and the British Standards codes of practice pertaining to access and inclusive design, such as BS8300-1 and BS8300-2. It should be noted that the two British Standards mentioned above were updated in 2018 and do not always align with the DfT COP. (However an deviation from the DfT COP has to be accompanied by a dispensation from the DfT).

Whilst there is a minimum PRM NTSN requirements for 1600mm on obstacle-free routes and via stairs and ramps, it is important to note that this dimension is measured between handrails and that further consideration with regards to width can often be necessary when it comes to enabling people to pass one another and when taking into account expected demand when pedestrian flow is undertaken.

Lifts should meet technical minimum requirements for lift sizes on the rail network (1600mm by 1600mm with 100mm minimum door widths) but also the overarching demand arising from pedestrian flow analysis. They should be through-lifts and if not should be sized to enable people to manoeuvre and turn around within the lift whilst others are also entering and leaving the lift.

Handrails should be provided to all stairs and ramps and inside lift cars. On ramps and stairs lower-level handrails should be provided for children and people of short stature.

3.6.12   Safety

A particular feature of bridge design within a rail environment includes means by which people are prevented from gaining access to live above-track power cables (often referred to as OLE) serving electrically powered trains and/or throwing things down onto trains and tracks and also means by which people are prevented from attempting death by suicide. This has often generated the design of high parapets, which in turn reduces visibility on and off the bridge deck and thereby negatively impacts people's sense of personal safety/security. Handrails can also give rise to means of climbing over the sides of stairs, ramps and bridges.

Designers are encouraged to consider means by which all safety concerns, including people's personal safety/security, are addressed by the edge treatment of bridges. In practice this usually means a form of full enclosure but with means of maintaining visibility to and from bridges, whilst mitigating against the risk of people experiencing vertigo.

Lift landing spaces should be clear of circulation and stairs and escalators require adequate run-off space as advised by technical guidance for their use.

Lift doors should face away from platform edges. Vertical circulation should ideally join the platforms in a parallel direction and where this is not possible barriers should be placed to avoid discharge into the platform at 90 degrees.

The number and dimensioning of stair risers and treads/goings should be in accordance with British Standards codes of practice, such as set out in BS8300-2 and the overall tread/going depth should be optimised for safety purposes as advised in the advisory note found within BS8300-2 pertaining to risers and tread/going dimensions. Steps consisting of only one or two risers are not permitted.

Escalators should not be overly long or high in overall rise so as to avoid the increased risks arising from falls. Whilst taking account of the consequential effect on pedestrians, consideration should be given to the provision of intermediate landings in order to break falls down escalator flights. Headroom above both stairs and escalators should be no less than 2300mm.

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3.6.13 Standard Footbridge Designs

Network Rail has commissioned standard footbridge designs, and these should be the first options when considering a new footbridge. These standard designs aim to be legible, accessible, innovative, inviting to use, complement local character and easy to maintain. The standard footbridge designs should be used for the majority of new footbridge installations.

3.6.14 Sensory environment

As with other aspects of station design the sensory environment is important. Consequently, good tonal contrast, lighting acoustics and tactile features are important.

Stair tread nosings should provide tonal contrast. Owing to tonal contrast, slip-resistance and durability demands, when it comes to specification it is advisable that the tread and nosing provision forms one complete unit addressing all requirements in a fully coordinated manner.

It is important to note that in terms of vertical circulation corduroy tactile warning is only necessary at the top and bottom of steps and stairs and should not be located at the top and bottom of ramps. However, designers are encouraged to use marginal tonal differentiation between landings and sloped surfaces to give greater indication of a change in level occurring. Tactile and braille information however become especially important when it comes to the design and detailing of lift controls.

Lighting to stairs and escalators should be no less than 150 lux but preferably 200 lux. Ramps should have similar levels of lighting provision.

Image 3.20 Hackney Wick stairs and lifts

NR Guidance Suite Reference

Station Footbridges & Subways
NR/GN/CIV/200/07

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3.7   Platforms

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3.7.1   Demands on platforms and spatial configuration

Platforms essentially act as the interface between stations and places and the primary mode of transport for which the station exists, namely trains. As such they can be especially hazardous environments – made even more so when located on lines serving fast services that do not stop at a given platform. They can be particularly hazardous or alarming environments for blind and partially sighted people, people who might not hear trains coming, people with various neurological conditions, people with mobility aids and wheelchairs, children, and parents with prams and push chairs. Consequently, their design plays a significant part in mitigating against such hazards.

In addition to wheelchairs, prams and pushchairs present on a platform, passengers might also have walking aids, cycles, luggage or children with them, or be especially vulnerable to the movement and presence of others owing to pregnancy, size, mobility, sight, hearing or neurological responses. This, combined with the volume of passengers departing or arriving on a train, can lead to platforms being not only very busy and crowded places, but environments that come with additional hazards and challenges over and beyond the presence of trains.

The capacity of platforms can be further compounded by the number of people that might be present to meet passengers or see them off and the extent of circulation to and from other platforms being routed via the platform in question. Consequently, platforms should be of appropriate widths and provide sufficient space for their expected use as assessed and determined by pedestrian flow analysts. Not only this, unless a platform serves a level entry train service, platforms need to be of sufficient width in order to cater for the deployment of portable ramps and the movement of wheelchair users on and off such ramps, whilst also taking into account the intensity of use of the platform overall.

If optimum platform widths are not provided it is far harder to determine train stopping positions, or accommodate some types, configuration and lengths of train, since train doors needed by people requiring portable ramps would need to stop where platforms are wide enough for deployment of such ramps.

Image 3.21 Crossrail refuge point

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3.7.2 Other platform safety factors

An especially significant feature of platform when it comes to safety of use, is the platform edge. Not only do passengers need to be able to identify the location of the platform edge but people's transfer to and from trains is significantly impacted by the platform-to-train interface dimensions. This determines the stepping distances for passengers, whether portable ramps can be safely deployed and the relative risks of people falling between the train and the platform.

This can be made more complicated where platforms are on curved lengths of track and door positions in relation to platform edges can be made excessively wide as a result. Where vertical stepping distances are excessive, passengers with or without mobility difficulties run much higher risk of injury and the experience for blind and partially sighted people can become particularly alarming as they seek to find where to place their feet.

Other considerations when considering the relative safety of a platform's physical design, include cross falls end of platform details and how people enter a platform. Cross falls are usually needed to enable platforms to drain, not to hold water, reduce the risk of sheet ice forming and to prevent those with wheelchairs prams, pushchairs and other wheeled modes of mobility from rolling towards the platform edge.

The end of platforms need be clearly guarded and demarcated to prevent people walking off the end of platforms, taking into account that people may not see where a platform ends and may fall or walk out beyond a platform and onto the trackside or even tracks.

When it comes to how people enter onto a platform it is far preferable to avoid a perpendicular direction of approach towards a platform edge. This is because a perpendicular approach runs the risk of blind and partially people heading directly for the platform edge and not detecting tactile warnings that could otherwise be stepped over and missed.

It is far preferable if people's direction of approach is to be parallel with the platform edge, offering a much greater likelihood that people detect the platform edge. In turn, when there are large volumes of passenger movement people will disperse along the platform rather than being propelled towards the platform edge by those that are behind them.

Image 3.22 Passenger boarding a train using a mobile boarding ramp

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3.7.3 Platform configurations and their impact

Platform numbers and their relative position to one another can vary, depending on the number of train services that a station is expected to serve, the number of lines served and the relative position of each line to oner another. Usually, platforms and the lines they serve are at a relatively consistent level but is not unusual for lines to be at different levels and approaching from different directions. Moreover, it is not unusual to either find platforms and the lines they serve located within cuttings or atop embankments.

The implication of platform configurations for passengers is that some platform locations and configurations can be relatively simple or otherwise complex and difficult to find and access. Consequently, when combined with overall platform lengths, their arrangement and how both vertical and horizontal circulation connects them can be especially significant when it comes to the complexity and journey at a given station. In particular distances can be lengthy and the consequential effort and time necessary to get to a given train service can be significant. As a result, keeping routes as short as practically possible, wayfinding and places where people can rest on route to their platform, are especially important.

Another consideration when taking into platform configuration and widths is how one might enable secondary means of escape of the ends of platforms and accommodate the volume of pedestrian flow expected in circumstances, evacuation scenarios, and timeframes determined by a Fire Engineer.

3.7.4 Shelter

Other than the movement that takes place between platforms and trains and on platforms themselves, the other significant activity on platforms is one of waiting for one's train at the beginning of a journey or whilst waiting for a connecting service.

Those waiting can be passengers themselves and people meeting arriving passengers or accompanying passengers to their trains to seem them off. As a result, the provision of shelter is especially important. The extent and type of available shelter needs to take account of the volume of people likely to be waiting at any one time and the impact of exposure to the prevailing elements and weather could have on those waiting.

Shelter from precipitation would be the primary form of shelter and as such the volume of people waiting on the platform at any given time could determine whether a platform canopy is provided or whether a localised shelter at the back of the platform is sufficient.

Another determining factor with regards shelter from precipitation would be whether a platform forms part of a route to another platform and how long someone might be exposed to the elements on route.

It would be reasonable to expect people to be dressed according to the prevailing temperature on a given day, however shelter from wind will offer greater protection from people becoming hypothermia whilst they are stationary. Therefore, shelter becomes an important consideration.

It may be appropriate, depending on climatic conditions and expected waiting times for waiting rooms with climatic controls such as heating and cooling to also be provided. Shade too from the sun and the availability of means of people hydrating may also lessen the risks of people becoming overheated and/or dehydrated.
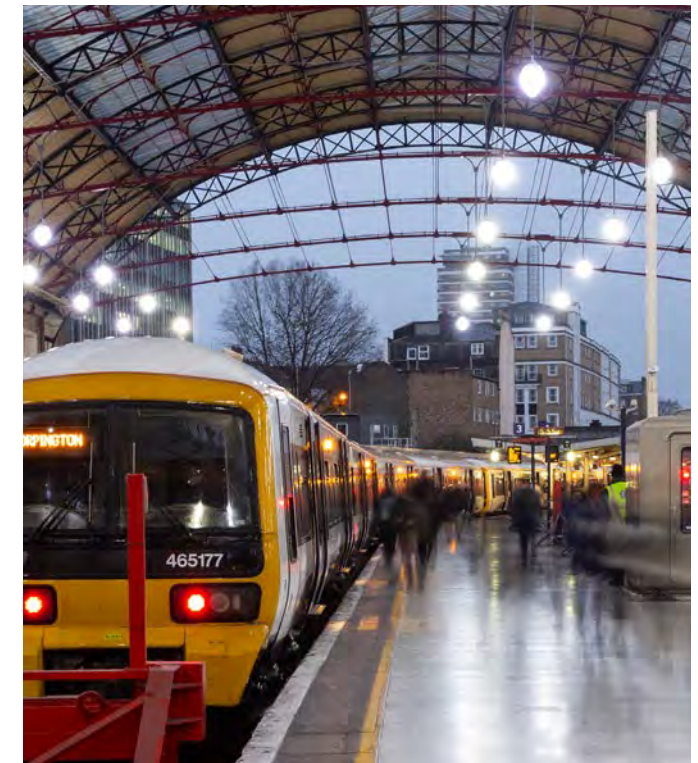
Image 3.23 London Victoria platforms 3 and 4

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3.7.5 Platform characteristics

Visual characteristics of a platform play an important role in a user's experience of the platform environment. It is therefore important that platforms are visually very clear and decipherable and that both natural and artificial lighting are carefully considered.

This has a significant part to play in safety of movement along a platform and people being able to identify the location of the platform edge. Moreover, visibility of passenger information in the form of Customer Information Systems (CIS) are important with their sizing, sighting and location having a significant part to play in offering information and therefore reassurance to passengers as to what is happening.

As not everybody will be able to see the platform edge, tactile platform edge warning surfaces play an important role and should be consistently provided. Recent design practice has also seen the emergence of tactile wayfinding surfaces. However, these should not be present on platforms where they can give rise to confusion with warning surfaces and unnecessary discomfort for people with mobility difficulties whilst traversing along and across platforms.

However, designers and operators are encouraged to utilise digital aids to navigation to provide clear and identifiable cane detectable back of platform edge.

Acoustics of platform environments will have a significant role to play in people's ability to hear announcements, such as train arrival information. It is important therefore that station platforms are carefully considered from an acoustic, Public Announcement and Voice Alarm (PA and VA) design perspective.

As with CIS this has a significant part to play in terms of people accessing information and therefore reassurance to passengers as to what is happening, especially if they are not able to see information that has been displayed visually.

Visually noisy elements of design can give rise to migraines, photo-sensory epilepsy and to cause people to experience other forms of sensory overload which can lead to some people having greater difficulty maintaining balance, walking or even to people's sight closing down to avoid a person's brain being bombarded by the impact of the pattern.

3.7.6 Access to facilities from platforms

The facilities that are available and in reach of a platform play an important role in the overall passenger experience.

In particular toilets that are in easy reach of platforms can greatly improve the experience of people who need to be easy reach of a toilet, whether due to metabolism, mobility, pregnancy, age or accompanying young children.

3.7.7 Platform configuration and mitigations

Designers should refer to Railway Group Standard GIRT7020. This document mandates requirements for the design and maintenance of station platforms for their safe interface with track and trains.

Clear sightliness should be provided along the platform to aide intuitive wayfinding.

Platform configurations, locations and the routes between them should be as short and as clear as possible, with careful consideration being given to wayfinding design and the siting of seating at where people might rest. Seating should be no further than 50m apart and meet current technical requirements.

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3.7.8 Platform edge and end conditions

The design of platform edges and ends, their visual clarity, the positioning and type of tactile warnings, the location of lines to demark hazardous platform edge conditions should follow current technical guidance with regards to platform edge design.

Platforms should have platform to train interfaces that comply with current standards and in order to achieve this it is usually necessary for platforms edges to be straight or that any curves in the platform edge alignment are such that they don't negatively impact achieving the target platform to train interface dimensions.

Level and independent boarding of trains is seen as a very positive aim. In practice this is usually exceptionally difficult to achieve where routes consist of old and diverse platform configurations with curved platforms, and where diverse train types and configurations are running. Achieving this is also made even more difficult if goods trains are also running on a line, as goods trains are usually wider at the point where a train passes a platform.

In order to achieve level and independent boarding one usually requires a new and dedicated line with consistent platform configurations, no or very minimal platform curves, no conventional goods trains running past the given platforms and trains designed and dedicated to the given route and platform configurations.

In some cases, greater flexibility in platform configuration may be possible where trains are equipped with train deck extenders that deploy and then bridge gaps between trains and platforms when train doors open.

As with independent level boarding, platform edge protection provision is seen as a positive if such provision can be achieved. This is usually in the form of barriers/screens located at the platform edge and doors/gates that automatically open on arrival and stopping of trains.

However, the feasibility of provision is usually dependent on criteria necessary for achieving independent level boarding. Moreover, they are usually much more dependent on very precise train stopping controls with the opening of doors/gates within the edge protection coordinating precisely we the opening of train doors.

The visual characteristics of platform environments in terms of tonal contrast should conform to technical requirements such as those stipulated in the PRM NTSN and national codes of practice.
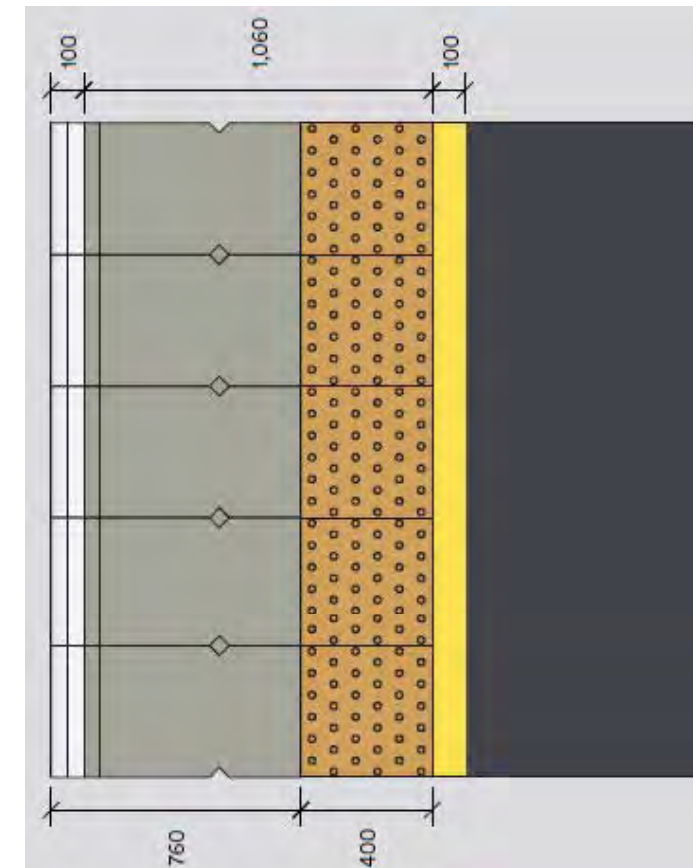
Image 3.24 Tactile Surface on Platform Edge

NR Guidance Suite Reference

Tactile Paving and Wayfinding
NR/GN/CIV/300/06

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Design elements that give rise to visual noise should be avoided. This can come as a result of vertical elements at the rear of platforms in the form of pronounced tiling patterns, cladding patterns and particularly palisade fencing. The impact of the latter can be made worse when sunlight casts through between the fencing pales and when it casts shadows onto platforms and thereby creates a pattern on the platform.

Lighting should meet the requirements of national codes of practice, should provide uniform illumination, and it is recommended that this is a minimum of 100 lux, and should particularly avoid causing glare and casting shadows in a manner that obscures a person's sight of where they are going whilst on a platform.

Due care should be taken with regards to the visibility of signals for train drivers,

The design of tactile warning features on platforms should meet current technical requirements. Due care and regard should be taken of confusion and resulting risks that can be caused if tactile wayfinding is introduced onto platforms.

Preference should be given to other means of enabling navigation through the use of clear cane detectable back of platform edges and the development of digitally enabled navigation aids.

Platform acoustics should be considered carefully in the context of national technical standards for acoustics and the deployment and use of Public Announcement and Voice Alarm (PA and VA) systems. Specialist advice should be sought.

3.7.9 Platform widths

The absolute minimum permissible platform width for platforms is 2500mm. However, platform widths as a minimum should have to not only accommodate a 1600mm minimum obstacle free route required within the PRM NTSN behind any platform edge hazard demarcation, but allow for:

→ People to pass one another which entails providing 2000m clear of any platform edge hazard demarcation or where there is minimal expected two-way passenger traffic, passing places and/ constrictions of short length.

→ The accumulative length of portable ramps (typically 1800mm, sometimes shorter but potentially also longer) and 1500mm space beyond in which turning space for wheelchairs and a resulting potential minimum width of 3300mm between platform edge and objects at the back of platforms such as lighting columns.

→ Space needed beyond the above in which lighting columns, structural columns, drainage, seating, shelter and other back of platform items are located.

→ Space for any expected number of stationary passengers waiting on a platform and any moving passengers expected to be present (including passengers passing along the platform in order to get to and from other platforms).

→ Space and minimum circulation widths needed when taking into account any fire egress considerations.

As a consequence, of the above considerations, 2500mm is often and inadequate width with which to start setting out an overall single platform width may typically be 3500mm or more. However, 2500mm may be considered workable towards the very end of platforms where they taper, especially if this is beyond the furthest point on the platform at which passenger doors on trains typically align themselves.

Since blind and partially sighted passengers may seek to utilise the rear of platforms as a cane detectable edge, significant benefit could be achieved where space allows, by placing seating set back from the rear of the platform edge. Similarly if lighting columns and other platform based objects can be placed behind a can detectable edge at the rear of a platform then this further facilitates navigation by use of a cane.

If the deployment of portable ramps is not possible at all points along a platform, designers will need to liaise with Station Facilities Operators with regards the type, configuration and length of trains stopping at the platform to determine train stopping position of trains and the resulting location of train doors likely top be used by wheelchair users.

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Despite the potential means of addressing tight constraints on platform widths, it should also be borne in mind that whilst a potable ramp is deployed and someone ins manoeuvring on or off it, the circulation of a platform may be obstructed and that staff deploying ramps may only be able to deploy them after most other passengers have boarded the train or vacated the platform.

Island platforms, with two platform faces may offer some greater opportunity for spatial efficiencies where space is tight. The deployment of portable ramps and wheelchair manoeuvring space may be able utilise some of the opposite side of the island. Alternatively, the movement of other passengers could switch to the other side of the island when a ramp is deployed.

3.7.10   Platform shelter and canopies

Shelter and waiting provision should take account of expected numbers waiting on a station, whether a station is an interchange and the level of exposure to climatic conditions present at a particular station. The first consideration should be shelter from precipitation and then shelter from wind, followed by climatically controlled waiting facilities where people could be waiting for extended periods of time and where prevailing climatic conditions could lead to people be particularly vulnerable.

3.7.11   Other Design considerations

Entry onto a platform should not be perpendicular to a platform edge but in parallel, to lessen the risk of people stepping over the platform edge.

Platforms should be configured so that there is a crossfall falling away from the platform edge.

Access from platforms to facilities such as toilets should be carefully considered and opportunities for providing toilets in easy reach of platforms should be carefully explored. At the very least explore how toilets might be made available through local partnership and whether this can be done through integrating toilet provision within a local mobility hub in or near the station.

3.7.12   Harrington humps

A Harrington Hump is a partial solution for improving step free access from station platforms on to trains. Typically, a Harrington Hump is a modular section of new platform installed on top of an existing platform, to align with the position of a train boarding point or multiple points. This creates a raised portion of platform with gradual ramps leading up. The thinking here is that this is better than a more significant step up from platform to train.

Although this might be of some benefit, this is not a perfect solution as these humps limit boarding opportunities for those who might require a reduced stepping distance. Further, the position of humps requires careful coordination with train operators, to enable alignment with train (rolling stock) specifications so that dimensions (vertical and horizontal) are accurate.

Image 3.25 Harrington Hump

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3.8 Waiting rooms

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Image 3.26 Folkestone West Waiting Room

3.8.1 Who and why

Waiting rooms and shelters on platforms are important facilities for a wide range of rail including parents with young children and many disabled and older people, including people for whom weather/temperature extremes or changes can pose significant problems.

It is important that people feel and are safe when using waiting rooms on shelters. Lighting, sight lines and visibility of other people/visibility for staff, and other features play a role in making waiting rooms and the people using them feel safe. Waiting rooms require sufficient space to accommodate wheelchair users and parents with double prams, and suitable seating for ambulant disabled people.

The provision of seating and other facilities should be located at sufficient distance from the platform edge to enable the smooth boarding of trains with boarding ramps. Section 4.1 of this manual provides further information on seating.

Passengers using the waiting rooms and shelters also require access to train information, including a clear view of customer information screens (CIS) and access to undistorted PA announcements; therefore, acoustics and induction loop provision are important.

NR Guidance Suite Reference

Station Facilities and Amenities
NR/GN/CIV/200/03

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3.8 Waiting rooms

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Image 3.27 Reading Assisted Travel Lounge

3.8.2 Design considerations

Waiting rooms or areas should be accessible to wheelchair users with a 1000mm wide entrance and generous manoeuvring spaces of at least 1500 x 1500mm. Waiting rooms or areas should provide a minimum of one space for a wheelchair user within the seating configuration. Suitable provision should also be made for prams and luggage. Accessible seating should be provided in waiting rooms. Seating should have tonal contrast against its background and be detectable at low level for long cane users.

Glazed screens and doors should feature visible manifestation and any swing glass doors should be visible from all angles when they are open. Waiting rooms should be designed to support ease of communication and use, easy access to journey and station information, and be comfortable for a range of people.

The Public Address (PA) system should provide undistorted coverage of the waiting room area and should be linked to an induction loop for the waiting room/area.

Lighting inside waiting rooms should be no less than 150 lux.

As well as some key design features outlined in this section, there is more essential reading within this manual that should be read alongside this section that should be used to inform the design of assistance lounges.

Journey, Facilities and Platform

3.9   Quiet spaces

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Image 3.28 Floral displays at St Annes on the Sea station

3.9.1   Who and why

Network Rail is taking steps towards creating a built environment that is more supportive of people with neurodiversity related needs and requirements and people of different beliefs.

Quiet spaces enable passengers and staff who are seeking a space in which to pray/contemplate, to do so in a safe and appropriate environment. Quiet spaces are also helpful for individuals who experience sensory overload and for families who may be travelling with someone who may otherwise become distressed or confused, to find a place of relative calm.

Space for prayer can be sought after by people of different beliefs and several times a day. Some beliefs also seek separate spaces in which to pray for men and for women.

People of some faith groups wash before prayer, so the provision of accessible ablution facilities is important also. Some people wish to remove shoes and others wish to keep their shoes on.

The image to the left demonstrates that an external space that is well kept and quiet can be a good substitute to a dedicated space for contemplation or rest.

Journey, Facilities and Platform
3.9 Quiet spaces

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3.9.2 Design considerations

Particular attention is drawn to HS2's recent Quiet Spaces Technical Specification (A new standard for health and well-being: HS2 quiet spaces technical specification), which is available online on HS2's Learning Legacy website, draws upon a study of the needs and requirements of diverse beliefs and people with differing neurological needs. The following text draws upon some of the key findings from that study. It is recognised that the HS2 recommendations apply most at very large stations. The principles however can be deployed at small and medium stations too.

It is advised that a minimum of two (preferably more) undesignated rooms be provided. This offers alternatives for people with different belief, gender, or neurological requirements to have access to a space at the same time. A large single room with a temporary division is not considered appropriate as the purpose of such a space is not for people to assemble, nor do temporary divisions offer adequate privacy.

Designers and operators should refrain from referring to such facilities as "multi-faith" as this can deter use by people with differing beliefs - including people who people who may be uncomfortable praying in a space identified with differing deities or do not adhere to any particular religion. Reference to facilities, such as ablution facilities, should not use terms used by one particular religion.

The room should have a suitable degree of privacy and sound insulation. The décor and lighting should be calm (substantially neutral yet not bland), and conducive to quiet contemplation. No particular feature or symbols should present that would be identified with one or other particular belief. As such, rather than provide indications of directions of prayer relevant to only one specific belief, any directional information should be in the four points of the compass.

Operators are encouraged to require those that use such spaces to remove and tidy away any item pertaining to their belief after use. Although due courtesy ought to be given to existing occupants of a room, it should not be obligatory for people to always remove their shoes – especially if they have prior use of a space. In other words, the practice of one belief should not take precedence over another. Where more than two quiet spaces are provided then operators are encouraged to offer the option of one space being bookable as this can offer greater predictability for people with neurological needs, or their companions, who may anticipate needing a break in their journey.

Quiet spaces in the form of rooms, should offer a reasonable level of privacy but also personal security through CCTV provision. Views out of such spaces are significantly beneficial, especially if looking out on a natural environment. Indoor, biophilic design features can also be beneficial as long as they don't generate visual noise.

Whilst quiet rooms are encouraged and offer privacy, designers and operators are also encouraged to identify public spaces, both indoors and outdoors, within or near stations, as places of relative calm where people might find peace and quiet, either as alternatives to quiet rooms or when quiet rooms are not available.

These spaces could include waiting rooms, quiet corners within concourses, local places of worship and/or locations within external landscapes or local parks. Ideally these should be in addition to quiet rooms but could also be identified when no quiet rooms are currently provided.

Careful consideration should be given to the design and siting of ablution and sanitary facilities so as to take account of accessibility, gender and cultural sensibilities around the relationship between each of these facilities and the activity of prayer. Any cubicles used for ablution should ideally be provided within full height compartments, rather than within cubicles with gaps at floor and ceiling level.

Journey, Facilities and Platform
3.10 Sanitary facilities – in general

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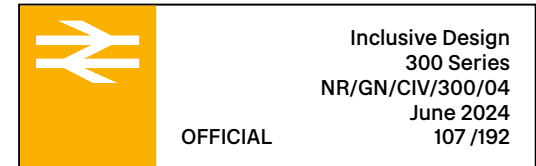
3.10.1 Who and why

This section explains toilet design, primarily for passengers. The Staff Facilities section covers what staff toilets, changing and showers should be in terms of provision but not design.

Many disabled and older people receive little warning of when they need to use the toilet and so having easy access to well designed, clean and accessible facilities is often a key factor in deciding whether or not to leave home.

In smaller unstaffed stations, sponsors of station projects and Station Facilities Operators (SFOs) are encouraged to explore utilising local partnerships, including the possibility of mobility hubs incorporating toilet(s), potentially in conjunction with a kiosk retail operator who can supervise and maintain the toilet(s)

As well as step-free and sufficiently wide routes to wheelchair accessible toilets being essential for wheelchair users, it is also essential that other people can reach toilets conveniently too. Easy and convenient access to toilets is required by people with mobility difficulties/aids, people who are blind or partially sighted, people who have toiletry needs, people with colostomy bags, older people, people who need to take medication, and people with luggage and/or small children. Moreover, pregnancy can increase the urgency of needing to find a toilet and parents/carers often need a step free access to a toilet when using push chairs and prams.

The location and placement of toilet provision is important. The following should therefore be taken into account:

→ People being prevented from using a toilet, if they do not have a Radar key and if the only toilet available has a Radar key.
→ People who cannot use stepped routes but might be able to otherwise use other toilets being prevented from using another toilet if the toilet on a step-free route is in use by another person/temporarily out of order.
→ People queuing on stairs which is uncomfortable, unsafe and causing obstruction, including to handrails by those who have need of them.
→ People placing themselves at risk as a result of feeling they have no other option other than to carry luggage, children, pushchairs, prams etc up and down stairs.

Situations where a wheelchair accessible toilet is the only provision that is step-free, and all other toilets being stepped access would not be a particularly equitable nor safe solution.

When considering toilet provision, it is important to consider the disparity in provision that can occur and lead to women often having to queue longer. Many people also prefer gender specific facilities, and where possible it is important to provide gender specific facilities, but also to provide gender neutral facilities for people who prefer to use them.

Extra width toilets for general and ambulant access purposes are preferred as these also cater for people with luggage.

Doors to gender specific toilet areas can present unnecessary obstruction, tightening of circulation and hygiene issues and so it is preferable to enable free flow of people whilst making it clear what the gender specificity of the toilets are.

Size, reach, dexterity and sight, can have a significantly impact on how adequate the fitting out of toilets are. For example: Some people with vision impairment may need to be able to use whatever residual sight they have, to identify where sanitary fittings and other key features are located, and tonal and colour contrast is important for this. Some people may also find it difficult to dry their hands using some hand dryers, especially 'blade' type dryers and all dryers should be selected with diverse dexterity and visual needs in mind.

Assistive technology in toilets can be considered when assessing incorporation of any new digital technology, such as the RoomMate audio assist system which can play an audio description of the compartment layout to assist people who are blind or partially sighted.

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3.10 Sanitary facilities – in general

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3.10.2 Design considerations

Step-free access to wheelchair accessible provision should be provided. In principle, step-free access to toilets, with sufficient width and manoeuvring space for a wheelchair user should also be provided for all other toilets and sanitary facilities as this increases options when a wheelchair accessible toilet is unavailable and where they could otherwise make do with general toilet provision

Unisex wheelchair-accessible toilets, baby changing facilities, gender-neutral toilets and Changing Places toilets should all be located within close proximity of each other and general gender specific facilities.

Where possible gender specific provision should always be available in addition to gender neutral/unisex facilities.

Wherever possible avoid installing doors to entrances to gender specific toilets containing several cubicles beyond.

Female facilities should be equitable in their provision and cater for demand and not place any more demand on queuing than for men. Nevertheless, the quantity of sanitary provision for all should seek to address the expected demand and minimise the likelihood of queues.

Wheelchair Accessible toilets should be gender neutral/unisex to cater for people who may require assistance from someone of the opposite sex. Routes to such provision should not pass through gender-specific sanitary areas for this reason.

Gender specific toilets facilities should have cubicles suitable for ambulant mobility access purposes, including drop down rails. Extra width cubicles should also be provided.

There should be an adequate even spread of light across all toilets facilities; leading to, within, and outside the cubicles.

Designers should assure all toilet doors are capable of being released or opened outwards. This provides means to retrieve someone who has collapsed behind the door. Wheelchair and ambulant access toilets are also need to open outwards at all times.

For all toilets, the door locks, handles, flush controls, taps and all switches and controls should be easy to operate from a dexterity and visual perspective and whilst using a closed fist.

Paper towels and hand driers should be located in close proximity to the wash hand basins.

There should be adequate visual and tonal contrast between floor/walls and sanitary ware and the background it is viewed against. It should also be possible to easily identify the cubicle doors in a row of cubicles.

Where urinals are provided, the front edge of urinals should be no higher than 500mm above the floor and at least one urinal should be 380mm high for people of short stature, children and if the facility is accessible to a wheelchair user.

Consideration should be given to providing for a convenient cleaners room as required in BS 6465-4- 2010 — Section 10.2

Refer also to Sections on Sensory environs, Circulation environs and Digital technology

NR Guidance Suite Reference

Public Toilets in Managed Stations
NR/GN/CIV/200/04

Standards Reference

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 and 2

Sanitary Installations
BS 6465

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3.10 Sanitary facilities – in general

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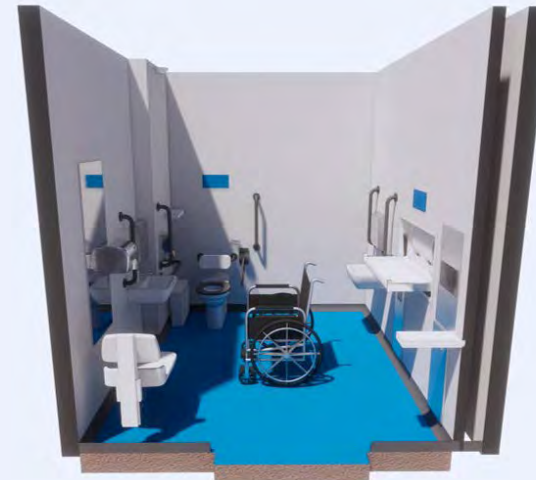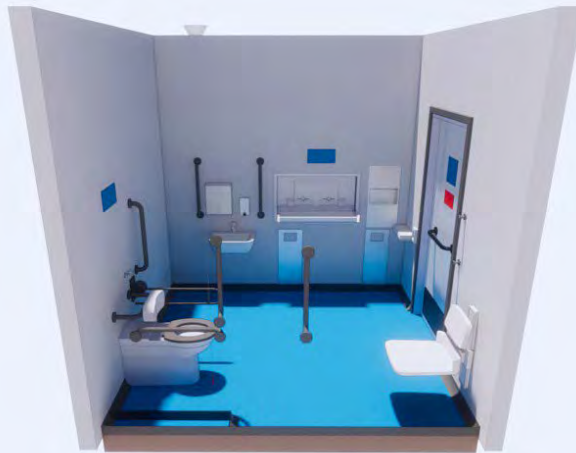
Image 3.29 Enhanced Accessible WC

* Sourced from "Rethinking inclusive public toilets for HS2" and referred to in Family toilets on Page 118

Journey, Facilities and Platform
3.11   Wheelchair accessible toilets

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Image 3.30 Coventry Station Accessible Toilets

3.11.1   Who and why

Toilet locations should support ease of use of the whole station and conveniently located near other facilities, as well as near other toilet provision to avoid any sense or experience of segregation.

Wheelchair accessible toilets should be designed for wheelchair users to use independently however they will also be used by wheelchair users who require the help of a carer, potentially of the opposite sex.

Wheelchair users have diverse transfer needs when it comes to transitioning from chair to toilet pan, including left and right transfer, which should, where possible, be taken into account when planning station layouts.

It is important that wheelchair-accessible toilet compartment layouts are designed to meet the relevant requirements of BS 8300-2, to maximise the effectiveness of the facility in meeting the needs of the widest range of disabled people. All elements of layouts and product selection need to follow the guidance. Design, maintenance and management regimes should be set up that will enable toilets remain clean, well-kept and accessible.

# Journey, Facilities and Platform
3.11 Wheelchair accessible toilets

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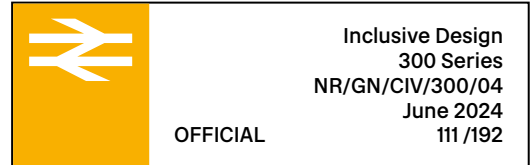
3.11.2 Design considerations

Wheelchair accessible toilets should be available during the hours when train services are provided and close to other sanitary provision, ticket offices, shops, station entrance etc.

It is important that wheelchair-accessible toilet room layouts are designed to BS 8300-2, to maximise the effectiveness of the facility in meeting the needs of the widest range of people for whom they will be of benefit. All elements of the layout, product selection, and construction process need to follow and pay close attention to all elements of, and details within the guidance. Using Modern Methods of Construction and robust certification processes in the design, construction and assembly of wheelchair accessible toilets are strongly encouraged in order to raise and maintain standards.

The toilet compartment should be no smaller than 1700mm wide x 2200 mm long with an outward opening door that provides a clear effective width of 900 mm. On platforms or other locations such as small stations where only one toilet is provided for passengers, a wheelchair accessible toilet needs to be provided that has both a small, and standard sized hand wash basin. It should provide minimum 2200mm x 2000mm space within the compartment and follow requirements set out in BS 8300-2.

If there is more than one wheelchair accessible toilet in a station building then one should provide for a left-hand transfer in addition to the usual right hand transfer layout.

Accessible WCs are generally unisex to cater for people who may require assistance from someone of the opposite sex. Routes to unisex sanitary provision should not pass through gender-specific sanitary areas for this reason.

A shelf surface should be provided, 950 mm above finished floor level, for colostomy bag changing. For colostomy bag changing it is also beneficial for there to be a mirror above the shelf. The provision of a shelf however, should be considered against security requirements on an individual station basis.

Designers need to select features, fixtures and fittings that will not compromise the layout, for example appropriately sized bins.

Other examples of important elements of the layout include:

→ Wheelchair accessible toilets should have an off-centre layout with a hand rinse basin which can be reached from the WC.
→ Where there is more than one accessible WC there should be a mix of left and right transfer layouts which should be clearly identified on signage and other information.
→ The location of hand drying facilities in relation to wash hand basins is important.
→ The toilet flush should be located on the transfer side of the toilet pan.
→ The tap on the finger rinse basin should be close to the toilet pan.
→ A mirror should be provided starting at 600mm above the floor.
→ An emergency pull cord should hang close to the hand rinse basin within reach of the toilet pan and from the floor. A reset button should be provided in reach from the WC pan.

Large sanitary and waste disposal bins ideally should be recessed into the wall. Sanitary disposal bins should be large enough to take adult sized pads.

Maintenance regimes should be set up that will enable toilets to remain clean, well-kept and accessible.

Journey, Facilities and Platform
3.12 Ambulant toilet cubicles

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3.12.1 Who and why

The majority of people with mobility difficulties do not require a wheelchair accessible toilet. Cubicles designed for ambulant disabled people are adequate and accessible for many people.

These are often located within single sex toilet facilities. Many older people do not see themselves as being disabled but struggle to use standard toilet cubicles and can benefit from toilets designed for ambulant access. Ambulant access toilet cubicles are a minimum of 800mm wide but benefit from being wider than standard toilet cubicles, have outward opening doors and some other accessibility features such as grab rails.

Guidance on ambulant toilets is available in BS 8300-2. Many people, such as parents with children, and people travelling with luggage also benefit from the extra space within cubicles designed for ambulant disabled people, or from enlarged cubicles. Enlarged cubicles do not have all the accessibility features that ambulant cubicles have but do have additional space for people who need it, such as people with luggage or with children.

(a) Elevation of cubicle layout
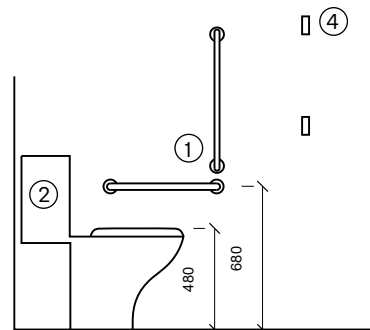
(b) Plans of cubicle layout
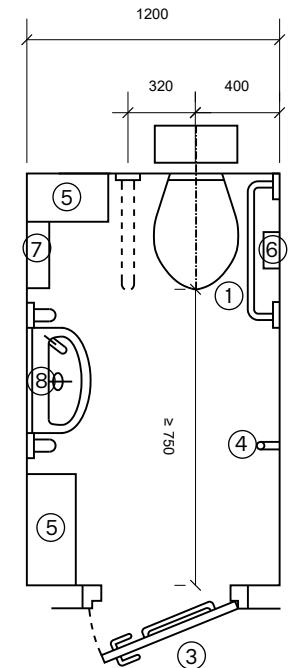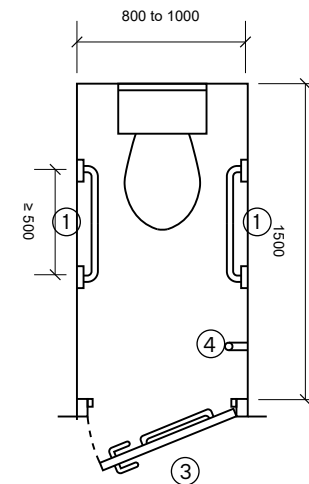
Image 3.31 Unisex toilet for use by people with ambulant mobility impairments

Key

1. Grab rail

2. Flat-topped close-coupled cistern providing a back rest and a colostomy bag changing surface for standing users

3. Outward-opening door with horizontal pull rail

4. Clothes hook

5. Shelf

6 Toilet paper dispenser

7. Paper towel dispenser

8. Mirror over basin

Journey, Facilities and Platform
3.12   Ambulant toilet cubicles

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3.12.2   Design considerations

Accessible toilet compartments for people with ambulant mobility disabilities, often referred to as 'ambulant cubicles', should make up 10% of cubicles (with a minimum of one). Where more than one ambulant cubicle is provided, both left and right handed doors should be provided.

Significant preference should be given to providing ambulant access toilets that are at least 1200mm wide, but in any case no narrower than 800mm wide

Ambulant access cubicle doors should open outwards and have a minimum clear width of 700mm. It should also be possible to unlock the cubicles from the outside in the event of an emergency.

The placement of ambulant cubicles should be well-considered as the outward opening door may affect circulation. For this reason, ambulant cubicles often need to be located at the end of a run of cubicles in a location where expected people movement is minimal. Nevertheless, proximity to the toilet area entrance/exit should also be considered in relation to people's travel distances.

Ambulant cubicles should be a minimum of 800 mm in width and have a minimum clearance of 750mm between the water closet (WC) pan and internal door face (activity space).

Grab rails should be spaced so that they are in easy reach of the pan. Toilet paper dispenser positioning should not obstruct grab rails.

Where space allows and toilet cisterns cannot be used as a shelf, a separate shelf surface should be provided, 950 mm above finished floor level, for colostomy bag changing. For colostomy bag changing it is also beneficial for there to be a mirror above the shelf The provision of a shelf should however, be considered against security requirements on an individual station basis.
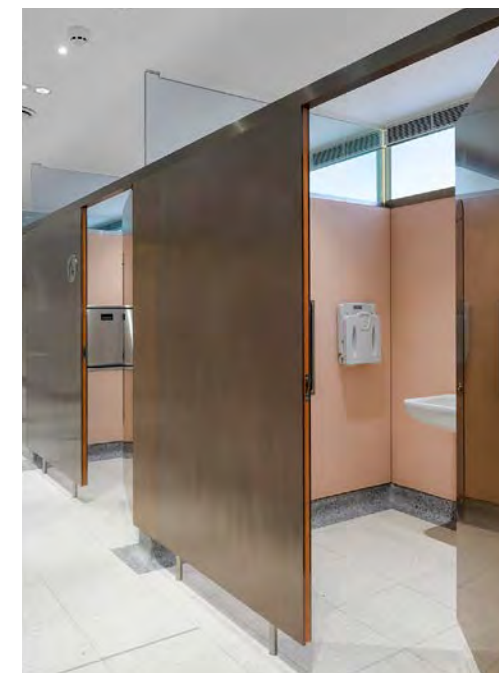
Image 3.32 Rear wall of cubicle in London Victoria Station

Standards Reference
Design of An Accessible and Inclusive Built Environment - Part 1 and 2 BS 8300-1 and 2
Sanitary Installations BS 6465

Journey, Facilities and Platform
3.13 Changing places

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Image 3.33 Waterloo Station Changing Places Facility

3.13.1 Who and why

A Changing Places (CP) toilet is specifically designed for people who require assistance to use a toilet and who potentially have need of a hoist and changing surface on which pads can be changed. The provision of these facilities is essential in empowering a whole group of people and their families to be able to undertake rail and other journeys and use public buildings and facilities.

A network of CP facilities is developing across the UK and they should at least be provided at all new Category A stations and as part of the refurbishments of major interchange stations. They may also need to be considered at other prominent stations.

A CP toilet is not a replacement for a unisex wheelchair accessible toilet, the layout of these facilities caters for assisted use and is not designed for independent use.

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3.13 Changing places

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3.13.2   Design considerations

CP facilities should be in obvious and convenient locations, with privacy, and close to a staffed area.

Ideally the CP should be close to the other sanitary facilities.

CP rooms should be a minimum of 3m x 4m with a ceiling height of 2.4m to accommodate a ceiling tracked hoist. The door should provide a minimum of 1000mm clear width.

Ceiling tracked hoist should provide access between wheelchair, toilet pan, and changing bench. The hoist should meet the requirements of BS EN ISO 10535 with a minimum safe working load of 200kg.

Provide a height adjustable wall mounted or movable adult changing bench with a safe working load of 200kg.

Large sanitary and waste disposal bins ideally should be recessed into the wall. Sanitary disposal bins should be large enough to take adult sized pads.

A height adjustable wash basin should be provided.

A Peninsular toilet layout should be provided to facilitate assisted use with hinged drop down support rails on both sides of the WC.

It is desirable to incorporate a shower within the facility.

A curtain or privacy screen should be included for privacy and dignity reasons.

Facilities should be heated with ventilation extraction fans that are as quiet as possible.

Lighting should provide a minimum of 300lux at changing bench level.

Alarm cords should be strategically located and placed at heights that are easily reachable for wheelchair users and from the floor.

Image 3.34 Changing Places Toilet Layout

Key

1. A height adjustable changing bench
2. A tracking hoist system and not a mobile hoist
3. There should be adequate space
4. A peninsula WC with room either side for carers
5. A screen or curtain
6. Wide tear off paper roll to cover the bench
7. A large waste bin for disposable pads
8. A non-slip floor

Journey, Facilities and Platform
3.14 Baby changing and breastfeeding

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Image 3.35 Coventry Station Baby Changing

3.14.1   Who and why

Maternity is one of the protected characteristics covered under the Equality Act. Children are also covered by the Equality Act owing to age being another characteristic and by virtue of their parents needs to provide for them parents need to be able to support their children's needs. Providing suitable facilities for baby change and breastfeeding is therefore important for parents travelling with young children.

These facilities should not normally be incorporated within standard, ambulant, or wheelchair accessible toilet facilities, unless they are in addition to other wheelchair access toilet provision since this can increase waiting times for disabled and other people to use toilets.

As a minimum, one accessible unisex baby-changing facility should be provided at all stations where sanitary facilities are provided.

Fold down changing tables can pose accessibility issues. Height and need for variability in height can also be another factor. These issues should factor in the selection of changing tables. Family Toilets are the preferred option for provide baby-changing within separate-sex facilities, however, the space requirement for a family toilet should be considered against capacity requirements.

Breastfeeding mothers require a separate clean, relatively warm area with a degree of privacy.

Journey, Facilities and Platform
3.14 Baby changing and Breastfeeding

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3.14.2 Design considerations

Where baby changing is provided in larger stations, it should be near but separate from toilet facilities.

Baby changing facilities should be located on accessible routes that are step-free, free from obstacles, well-lit and clearly signed.

A unisex accessible baby change facility should follow DfT Code of Practice guidance and have the following features:

→ Minimum 2m x 2m space

→ A minimum 1500mm x 1500mm space for a wheelchair user to turn

→ An accessible nappy vending machine and a sanitary disposal bin

→ A paper roll dispenser should be provided and should be easy to use with one hand

→ A washbasin, soap dispenser and automatic hand dryer

→ A Drop-down seat with harness should be provided for small children.

→ Shelf space for belongings and cleaning materials

→ All appliances should be capable of being used by someone with limited manual dexterity an/or with partial sight.

→ Adequate tonal and visual contrast between the main features, equipment and controls and their background, including door handle and lock, hand basin and taps, any toilet seat/ flush/push buttons/grab rails, and hand dryers and controls.

→ The use of colour and finishes should be considered to create a welcoming ambience.

→ The disposal bin and all surfaces should be easy to clean.

A changing table should be provided within a baby changing facility and should incorporate accessible features.

Changing tables should:

→ Be set against the wall

→ Be suitable for use from a standing or seated position, and either fixed at a 750mm height or be height-adjustable. A chair should be provided if a fixed changing table is installed.

→ Should accommodate older children who wear nappies

Refer to DfT CoP for more detailed design guidance.

Enlarged toilet cubicles in gender specific areas can also incorporate baby changing facilities so that they can be used by people who require more space and by people with luggage. However, these should be in addition to wheelchair accessible baby changing facilities.

Breast feeding rooms should be clean, wheelchair accessible, warm area and provide for privacy. The breastfeeding area should be close to the baby change facility but ideally not combined with the change facility. Ideally, the area should be restricted to parents and their children, but this may not be possible to achieve in small stations.

Journey, Facilities and Platform
3.15 Family toilets

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3.15.1   Who and why

Family toilets should be provided, where possible, to enable a parent or carer, young child and baby to all use the same facility. This is most likely most feasible in larger stations. It is also advantageous to provide baby changing facilities within separate-sex areas including family toilets and enlarged cubicles, which should be designed for the needs of a wide range of disabilities and passengers with prams and luggage.

Family toilets are the preferred option to provide baby-changing within separate-sex facilities, however, the space requirement for a family toilet should be carefully considered along with other demands for space.

Family toilets should contain the following facilities:

→   A screened toilet, washbasin, and baby-changing unit with adjacent toddler seat.

→   An additional, smaller, WC for children where space allows.

→   It is preferable to provide both a wall mounted toddler seat with restraints, and an additional, smaller, WC pan for children where space permits.

→   The facility should have sufficient internal space to accommodate a double pram or pushchair.

→   It should be accessible to people with mobility difficulties, fitted with grab rails, and an outward opening door.

Compact versions of these toilets could also be located on platforms serving large station where other toilet provision is also provided elsewhere in the station.

Image 3.36 Unisex family toilet

* Refer to "Rethinking inclusive public toilets for HS2" for room elevations and Page 109 for 3D image

Key

1. Vertical grab rail
2. Drop down support rail
3. Flat-topped close-coupled cistern
4. Sanitary disposal unit
5. Horizontal grab rail
6. Vertical grab rail
7. Toilet roll dispenser
8. Hand rinse basin
9. Vertical grab rail
10. Disposal bin
11. Shelf (800mm above FFL)
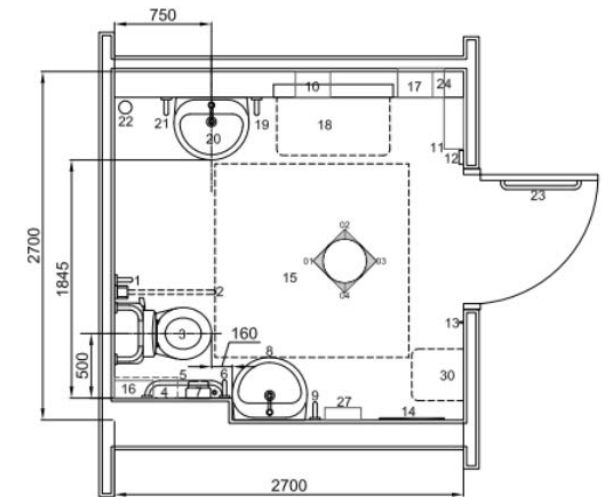
12. Sanitary disposal bag holder
13. Clothes hooks
14. Full length mirror
15. Wheelchair turning space
16. Colostomy bag shelf
17. Nappy disposal
18. Fold down baby changing table
19. Vertical grab rail
20. Full height basin
21. Vertical grab rail
22. Floor drain

23. Large door (900mm width)
24. Wet wipes/Gel dispenser/Nappy dispenser
25. Paper towel dispenser
26. Soap dispenser
27. Automatic hand dryer
28. Alarm pull cord with two red bangles
29. Alarm reset switch
30. Drop down seat/bench
31. Signage

Journey, Facilities and Platform
3.16 Station facilities – in general

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3.16.1   Who and why

Station facilities serve passengers making rail journeys, however some facilities might also be used by rail and other staff, for example retail facilities.

As well as using stations for rail journeys, people might use station facilities whilst moving along public 'through' routes through stations (which might be present or not depending on the station size, location, layout and number of entrances).

People might also enter and/or use station facilities to buy advance tickets, to shop or rest, to shelter from weather, for personal safety reasons, as a meeting/waiting point, or to enjoy public art, performance, or the building itself, for example the heritage or architecture.

Stations and their associated facilities should be accessible for a very wide range of people, and groups of people, many of whom might have accessibility requirements, or a combination of these. The Testing Assumptions Section number within this manual is essential reading for gaining initial understanding of the range of personas, scenarios, and needs that should be considered when designing and managing stations.

Passenger areas should be conveniently located close to main circulation routes and include accessible ticketing facilities, information points, toilets, waiting areas, shops, cafés and restaurants.

As well as the services and support that rail staff offer, retail staff might also play a significant role in the overall passenger experience, for example pointing passengers towards facilities or alerting rail staff about needs of particular customers, which might take on more significance at smaller stations.

The presence of retail staff can also greatly improve natural surveillance and the personal safety/security of passengers. Moreover, if there are no rail staff, then mobility hubs featuring kiosks, staffed by retail staff, could offer support to passengers with ticketing and maintain and supervise toilets.
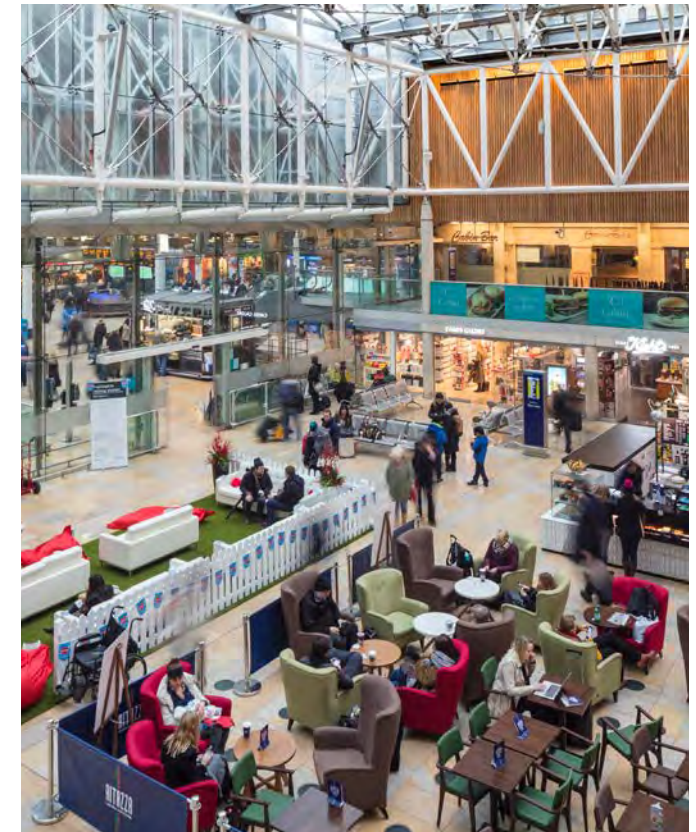
Image 3.37 Paddington Station

NR Guidance Suite Reference
Station Facilities and Amenities NR/GN/CIV/200/03

Journey, Facilities and Platform
3.16 Station facilities – in general

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3.16.2   Design considerations

There is a wide range of design considerations that relate to station facilities. As well as the subsequent sub-sections/clauses within this manual that address the design of various facilities such as retail, toilets, assisted travel lounges and others, the following list highlights some other essential key features and design considerations that should be provided, or included in the incorporation of station facilities:

→   Phone/device charging points and assistance for using these might be important for navigation, ongoing journeys, accessing journey information, and personal safety as well as for general management of a journey such as meeting up with a journey companion.

→   Telephones, vending machines, seating (and any charging point provision) should be grouped together off the circulation space.

→   CIS screens and wayfinding decision points should be located to avoid obstructing circulation routes whilst being visible from some accessible seating.

→   Dog spending areas should be provided at larger stations for guide dogs and pets traveling on the rail network. There is further guidance on this in Network Rail document reference NR/GN/CIV/200/04. They should be conveniently located for people arriving by train, and for people arriving at the station by walking, public transport, vehicle drop-off points and parking provision. Partnership opportunities for dog spending could be explored where it is not possible to provide this at stations.

People with dietary needs might need clean places with a table away from circulation routes to eat and drink own food as well as places to buy food and drink.

Some people might need to buy food whilst one person in their party eats their own food due to health/disability reasons. Some people might need to eat whilst being close to a toilet, so the relationship with family-friendly and accessible sanitary facilities is also important.

The spatial and sensory characteristics of retail and commercial facilities and be especially significant. It is important that a similar rigour is applied in terms of what happens in retail environments as the rest of the station.

For example, station facilities operators should be dissuading operators of retail and commercial facilities from being the source of visual or auditory noise or discomfort caused by lighting or digital displays that have not adequately considered the potential impact on station passengers and staff.

Image 3.38 York Station Concourse

Journey, Facilities and Platform
3.17 Ticket and information counters

![National Rail logo] Inclusive Design
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Image 3.39 Ticket office at Sunderland station

3.17.1 Who and why

Ticket and information counters are likely to be an important first point of contact with station staff for passengers who are buying tickets, planning journeys. It is therefore important that ticket counters are easy to find and identify.

Counters may also be used to arrange advance journey assistance, or for people to announce their arrival at a station to get journey assistance from staff. This may also happen from arrival at a mobility hub or at another arrival point such as disabled cycle parking, depending on the passenger need, and station size and layout.

Wherever possible general facilities should be as universally accessible as possible so as to reduce the perceived stigma of separate provision. However, separate and more dedicated travel assistance provision will be preferred by some who desire greater support and/or a quieter space in which to interact with staff.

Where counters are provided, visual and audio communication needs of both staff and passengers are important at counters. Easy access to tactile maps could also help staff communicate to passengers the layout of the station and the route to their destination point.

Journey, Facilities and Platform
3.17 Ticket and information counters

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3.17.2 Strategic considerations

Whilst tickets can be purchased by a variety of methods including personal digital devices or ticket vending machines (TVM), these are not always accessible for some people, such as blind people and some partially sighted people, people who do not have the reach and dexterity with which to access controls, or people for whom the technology is too confusing or gives rise to anxiety.

Contact with staff is therefore often essential to make purchases, to understand ticket types/options and discounts, and to access information with regards to timetabling, changes, routes, and facilities (including information on accessible facilities). Consequently, ticket counters and staff assistance with the use of TVM form a very important function with regards to access to the railways.

If there is no staffing at station and no formal and immediate means of assisting people, then local partnership arrangements for assisting people with ticketing, with or without a retail supported mobility hubs, could make a significant difference to people being able to access the railways.

The acoustics and ambient noise level within the ticket counter area is important for communication, particularly people with hearing difficulties. Both staff and customers need an optimum environment in which if they are sighted or can hear, can see and hear each other easily, and which is enabling for lip-reading purposes.

Good acoustics are also important for people who are blind or partially sighted as they may rely more on audible information, and for anyone else who benefits from clear audible information; for example, people for whom English isn't their first language and who may be tourists. Not everyone who finds hearing difficult uses hearing aids and as such all these other factors are just as important as induction loops and amplification systems, which on their own, will not be sufficient.

Queuing and services systems, counters, and the design of counter offices/areas should be designed to enable easy communication and purchases. These should factor in the needs of wheelchair users, people with mobility aids or difficulties, people with buggies/children, blind and partially sighted people, and people who are Deaf or hard of hearing, or have neurological conditions.

Queuing is difficult for people who cannot stand for long periods without pain/discomfort or who find it difficult being hemmed in with lots of other people. Long snaking queues also add significantly to queuing distance. Some queuing barriers can also be hard to detect for people who are blind, partially sighted, and can be confusing for some people with neurodiverse conditions.

The queuing system should be easy to understand and the design of the counter and the queuing system should be considered together so that people who need to sit/perch can do so, whilst being able to see and hear when they should proceed to the counter.

Wheelchair users, people with mobility aids, luggage, cycles, children and/or buggies, and companions standing alongside people they assist, require enough space in front of the counter and in which to manoeuvre. Wheelchair users and people of short stature should be able to make eye contact with staff at the counter and be able to easily communicate, access information, have a surface on which to rest when writing things down and means of easily making transactions/purchases. Reaching and interacting with debit/credit readers can also be difficult for some people unless there is flexibility in the how it or ticket purchases are enabled.

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3.17 Ticket and information counters

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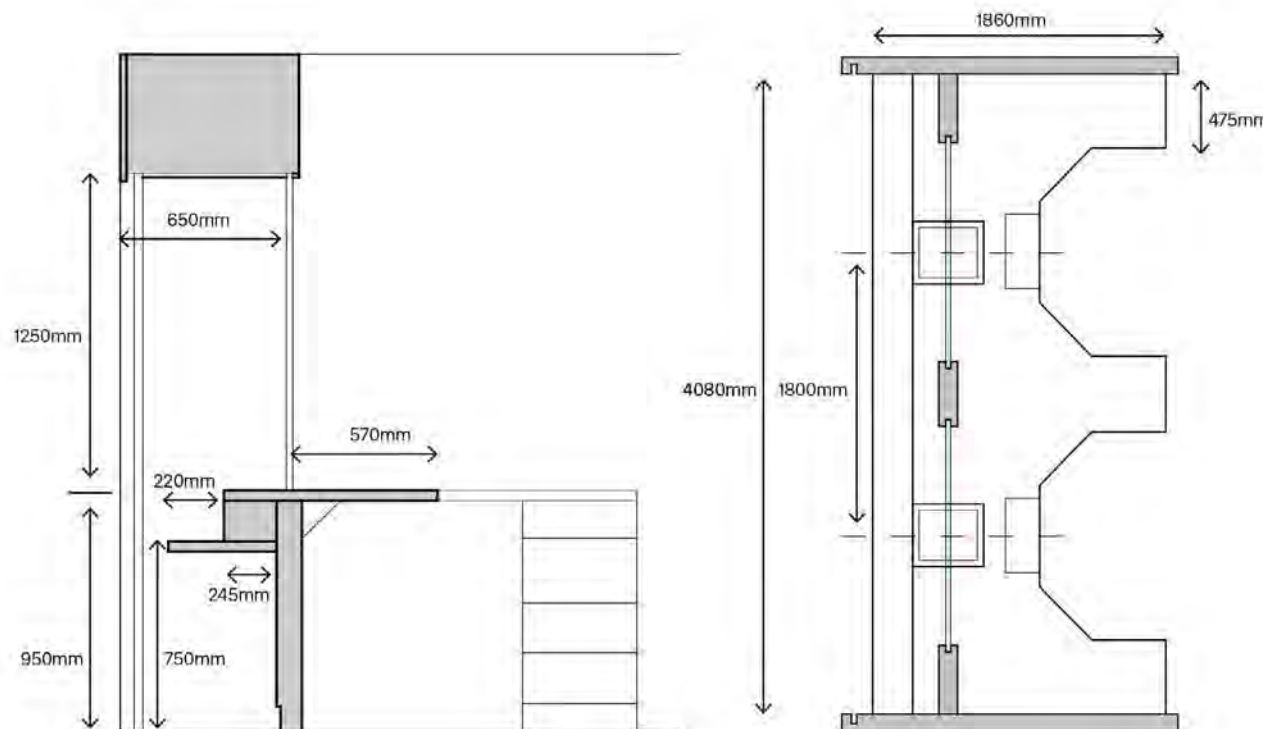June 2024
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Image 3.40 Ticket Counter Section and Plan

3.17.3   Design considerations

The acoustics around counters, within ticket offices or other spaces should be designed to be conducive to verbal communication between staff and customers, avoid people having to deal with excessive background noise. Whilst Public Address (PA) speakers will be needed, they should be located so that they provide clear undistorted announcements and do not interfere with communication at counters.

Ticket counters that are in ticket offices and separate to noisier areas of a station can often work better when it comes to reducing background noise. Although separate ticket offices are preferable, where all options have been exhausted and this is not possible, and where counters are to be in more open areas with more background noise then it is beneficial to provide an acoustically attenuated booth of baffles to counters.

Induction loops should be provided at all counters and where necessary, such as where glazed screens are used, amplification should also be provided for individuals who don't benefit from hearing aids. With the development of digital technology is may also be possible to provide voice captioning facilities too.

Glazed security screens should be avoided but where they are required, non-reflective glass should be specified, and lighting should be designed to provide even lighting and to avoid glare and reflections. Counter designs, however, should be flexible to allow for the addition of glazed screens to provide staff with greater protection during a pandemic or if perceived personal safety/security risks increase.

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3.17 Ticket and information counters

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Any localised visual display screens for ticket or other information should be in the line of sight for anyone using a ticket counter or TVM and provide for interaction from both higher and lower level.

Payment devices for use with bank cards or phones should always provide flexibility in order to facilitate interaction for people of differing reach and dexterity.

Backgrounds behind the counter staff (and where possible behind passengers) should be plain, should minimise glare from natural and artificial light.

Lighting should enable lip-reading. Lighting in ticket or information offices should be no less than 100 lux. However, for some people to undertake some detailed tasks, necessary to facilitate transactions, lighting may need to be as much as 200 lux. Task lighting for staff should not cause glare and flexibility in the level of illumination should be provided by suitably controlled light fittings.

Where ticket counters are located within a series of similar-looking units within a station, designers should consider what will help people will easily identify which one is the ticket office. Appropriate use of architecture, identifiable physical features, colour, tonal contrast, lighting and signage should be used to highlight the location of ticket and information counters and or offices. Reliance on signage alone can often be insufficient in busy environments.

Queuing barriers should be detectable at floor level and should be designed so as to avoid people becoming entangled. The design of the queuing and service system, and queuing area should preferably enable people to sit and wait if they need to.

Whilst a ticket number system could enable people to sit whilst waiting, staff will need to be alert to the possibility that blind and partially sighted people may not be able to see this and when a number is called may not see or hear any call-up system.

Any queuing system should be easy to understand including for people who don't read English/ are unfamiliar with UK rail systems.

A travel assistance office should include means of assisting people with ticket purchases and should be clearly communicated both visually and audibly within any general ticket office, counter or TVM area, in order that people know where enhanced assistance is available.

All counters should be dual height with a knee recess. The design of the front edge of counters should facilitate the retrieval of tickets and assist people with limited manual dexterity when dealing with tickets, cash and other objects.

Refer also to Lighting, Acoustics, induction loops and Seating

NR Guidance Suite Reference

Station Facilities and Amenities
NR/GN/CIV/200/03

Standards Reference

Design For The Mind - Neurodiversity and the Built Environment - Guide
PAS 6463:2022

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 and 2

Journey, Facilities and Platform
3.18 Self service machines

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Image 3.41 Hayes & Harlington ticket machine

3.18.1   Who and why

All machines intended for self-service, such as Ticket Vending Machines (TVM), car park ticket vending, EV vehicle charging, food and drink vending, other product vending, cash machines (ATM) and retail self-service checkouts should be designed to meet the requirements of a wide range of users, including people of differing stature, people standing or sitting, people with differing sight and auditory requirements and be designed to be as user friendly and as easily understood as possible.

Despite incorporating some enabling features, many aspects of self-service machines are not accessible for many people. Touch screens for example are inaccessible to many people who are blind or who have partial sight. Some people also find ticket machines non-intuitive and therefore difficult to purchase the right ticket, which can be more challenging for some people with neurological conditions.

Alternative methods of accessing services should also be considered or provided where self-service machines are not accessible. Staff might also be able to provide alternative options, such as payments being accepted by roaming staff or assistance being made possible in retail outlets.

Journey, Facilities and Platform
3.18 Self service machines

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3.18.2 Design considerations

Self-service machines should be located out of circulation routes but in visible locations.

At least one self-service machine in each location should be at a suitable height for use from a seated position. However, it is often preferable for self-service machines to have in-built features that enable for different heights and reach.

To help enable safe and easy use for all, self-service machines should:

→ Be in a convenient, accessible and clearly visible location, that also has good inward and outward sight-lines to support personal safety/security.

→ Provide waiting/use/manoeuvring space for wheelchair users, buggies, walking aids, and children so they can stay close to parents/carers.

→ Be located on a level area with a minimum unobstructed manoeuvring space of 1500 x 1500mm, although 2000 x 2000mm is preferred.

→ Height of the controls should allow use by of differing stature and from a seated or standing position.

→ Have controls between 750mm and 1200mm above finished floor level and should have clear knee space / not have obstructions such as a plinth etc that would obstruct convenient use.

→ Provide accessible queuing systems that work for people who cannot stand for long periods without pain or discomfort, and/or offer a solution such as roaming/support services staff at busy times. However, any such system needs to be easy for people with differing visual, auditory, language and neurological needs to understand.

→ Controls should be easy to use for people with limited manual dexterity and partial sight, and those who are Deaf or hard of hearing.

→ The overall size height and type/design of text and symbols should be optimised for, sight, ease of reading and comprehension. - Be easy to view, without sunlight or other light sources interfering with viewing or use.

Queuing systems for ticket machines, including for rows of/multiple machines should be designed in a way that enable comfortable use for people who cannot stand for long periods of time. Such systems need to be easy to understand and use, for people with a range of need/ requirements. Also see section on ticket counters and offices for more information on queuing systems.

Ticket machines should offer all of the discounts available at a staffed ticket counter. Signs indicating the location of coin and card slots should be clearly visible on self-service machines.

Cash machines/ATMs in particular should be located where they are overlooked by passers-by to provide a degree of security. This is also important for other self-service machines, as is good lighting and sight lines.

Ticket machines for car parks should be located near, or adjacent to, any Blue Badge bays.

It should be possible to purchase tickets on the train or at the final destination, when boarding at unstaffed stations where self-service machines are the only means of buying a ticket.

Refer also to Lighting and Personal safety

Journey, Facilities and Platform
3.19 Ticket barriers

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Image 3.42 Accessible Gateline

3.19.1   Who and why

Ticket barrier gate-lines are often provided at key stations for revenue protection. Where they are utilised they create a intrinsic barrier for passengers who are blind or have partial sight, for people who have neurodiverse conditions, and for people with mobility difficulties, buggies and children, who may often may require assistance from gate-line staff. Tourists sometimes also need assistance.

Good design involves finding the right balance for project requirements. Inclusive design is similar in this respect but as service providers Station Facilities Operators have a duty to remove physical features that present a barrier or provide a reasonable means/alternatives for avoiding the feature that creates a barrier and adapt policies, practices and procedures if necessary.

The location of any ticket barriers / gate-lines needs to make sense, including for people who may find crowds difficult to negotiate, and for people with mobility difficulties who may find it harder to move backwards or sideways if needed. For example:

→ If someone were to walk backwards towards into a blind person if they can't proceed forwards or

→ If a person using a walking aid needs to move through a crowd to another barrier, upon finding ticket control functions does not accept the ticket method they are using.

Journey, Facilities and Platform
3.19 Ticket barriers

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3.19.2 Design considerations

During early design stages, the location and setting out of the ticket barrier gate-line should be carefully considered and located to facilitate easy movement of passengers though the gates. Any conflicts with passenger flows, including run-offs from escalators or secondary revenue activities that could impede queuing, should be addressed and designed out.

If ticket barrier gate-line are fitted, then:

→ An assessment using the persona narratives method is recommended to help appreciate potential, station-specific and more nuanced aspects of people's experience of using ticket control machines. Such an exercise should also seek the views of station managers and staff. This should help to inform the location, layout, and design of the gate-line.

→ A minimum of one of the machines should have a free passageway with a minimum width of 900 mm or more and should be able to accommodate a wheelchair up to 1250 mm in length. In the case of upgrade or renewal, a minimum width of 800 mm is permitted.

→ There should also be a non-turnstile entry exit gate available for use by persons who have need of alternative access to one side of the gate-line.

→ Ticket readers should be specified which are accessible for passengers with sight, dexterity and ease of use in mind.

Image 3.43 Ticket Gates, West Hampstead Thameslink

NR Guidance Suite Reference

Station Facilities and Amenities
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Journey, Facilities and Platform
3.20 Assisted travel lounges

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3.20.1   Who and why

Assisted travel lounges provide a welcoming waiting space for people of all ages who have need of assistance or who need somewhere to wait who might have mobility, sensory and neurological needs. They are typically necessary at larger stations. A dedicated staff team is usually on hand to help to provide assistance and information. It should also offer a reassuring presence which is likely to:

→   Improve overall and general journey confidence for people with accessibility needs, and

→   Enhance feelings of personal safety in and around the lounge area, for all station users.

Where assisted travel lounges are not provided, those who have need of assistance will need to clearly identifiable locations from which pre-arrange assistance can be provided. Means of contacting assistance staff from such locations are also important.

Space for wheelchair users is essential, as is space for groups, including where multiple members of a group such as a family might need space to sit together. Some people might have need of using a wheelchair provided by the Station Facilities Operator whilst they are in the station, who have not brought their own wheelchair.

Larger stations may require electrically powered vehicles capable of taking people to, from or between platforms. In such cases they will need means of pulling up at or near to assisted travel lounges.

Some people might have dietary needs, toiletry needs or to take medication. However dedicated well-being rooms would often be preferable for medication purposes.

Some people might have neurological conditions, including learning difficulties, mental health conditions, dementia or conditions that give rise to sensory hypersensitivity. Some people might therefore want to use a lounge as a relatively quiet space, although dedicate quiet spaces are also advised.

Children and families with disabilities who are using lounges might have particular needs such as being able to access playful features and accessible family sanitary provision, and seating away from entrance doors to make it easier to supervise one child whilst assisting another. Dedicated child friendly/family spaces are also advised as alternatives.

These considerations are mentioned not to dictate lounge design, but to highlight some example needs that people have on journeys, and to prompt thinking about the different ways in which people might want/need to use quieter, and accessible spaces.
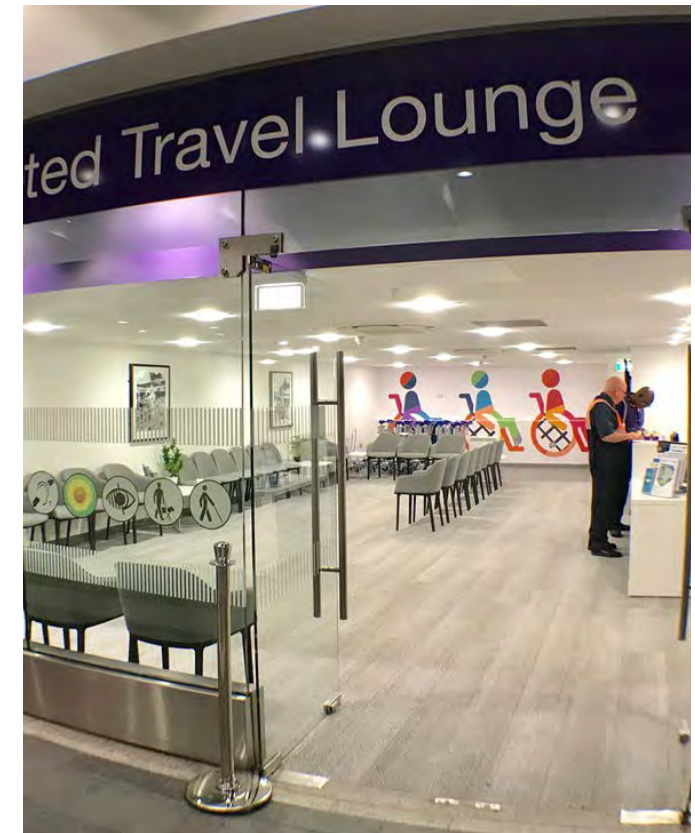
Image 3.44 Birmingham New Street Assisted Travel Lounge

Journey, Facilities and Platform
3.20 Assisted travel lounges

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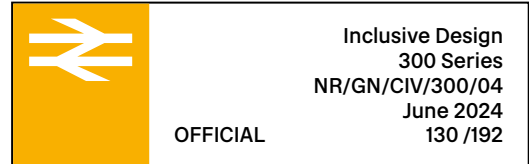
3.20.2 Design considerations

The lounges should be highly visible and easy to find. Although a relative degree of privacy is beneficial, views in and out and out are important for people's personal safety/security.

Lounge locations, layout, entrance/s and design should enable them to be easily found and used during station opening hours.

Clear signage should be used to help partially sighted passengers and other people identify and find the lounge.

Ease of access to sanitary, well-being, quiet spaces and child/family friendly facilities are important considerations.

Lounges should therefore be designed to support ease of access to journey and station information and be comfortable for a range of people.

There should be ease of accessing information including visual information and visual/audio announcements. There should means of supporting a range of communication needs between staff and passengers, and between groups of passengers, such as verbal conversation, signing or lip reading.

Both audible and visual travel information and announcements should be available within the lounge. Induction loops are also needed in assistance lounges to enable conversations between staff and customers and for passengers to keep track of announcements.

Lighting inside waiting rooms should be no less than 150 lux in the majority of the lounge. However, an area with lower level lighting is beneficial and will provide greater choice where individuals have need of lower lighting levels.

Daylight and views of natural scenery are beneficial. However direct sunlight should be avoided.

Seating design and placement, thermal comfort, lighting, interior design, acoustics and communications systems are important for helping achieve this, and specialist input should be sought for advice on these design elements.

Accessible seating should be provided and should be organised and designed to support ease of communication, for example people being to face each other to lip-read. Seating should have tonal contrast against its background and be detectable at low level for long cane users.

Any waiting area or lounge should be accessible for wheelchair users, with a 1000mm wide entrance and maneuvering space of at least 1500 x 1500mm.

Waiting areas should provide a several spaces for a wheelchair user within the seating configuration. Suitable space should be provided for passenger luggage and prams, and consideration can be given to where families may prefer to sit, e.g., away from an entrance door.

Glass walls and doors should feature visible manifestation and any swing glass doors should be visible from all angles when they are open.

As well as some key design features outlined in this section, there is more essential reading within this manual that should be read alongside this section that should be used to inform the design of assistance lounges, refer also to sections on: Seating, Doors and Ironmongery, Glazed Screens and Balustrades, Digital Communications.

Refer also to Seating, Doors and Ironmongery, Glazed Screens and Balustrades, Digital Communications

Standards Reference

Design For The Mind - Neurodiversity and the Built Environment - Guide
PAS 6463:2022

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 and 2

Journey, Facilities and Platform
3.21 Retail and commercial

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3.21.1 Who and why

Retail is a key amenity for many passengers, and rail and other station staff. Access to station retail such as shops (including pharmacies), cafés, kiosks and restaurants is often problematic for disabled people and others, such as parents with prams. Access to food and drink is important for some people for medical reasons, such as diabetic people or people needing to eat/drink to take medication.

Retail provides an important income stream for NR but the fit-out and operation of retail units is normally a tenant responsibility. As a service provider Station Facilities Operators have an obligation to work with neighbours and tenants to make retail provision accessible and welcoming, and to remove barriers to all station facilities and services.

It should be understood that not all functions will be accessible to all people, and solutions for equitable access to services and amenities might sometimes be reached by providing a combination and range of features, services and systems. For example the option of table service in a café for parents or for people with mobility difficulties, or the option to place a counter order with staff where using a digital ordering system may present a barrier for a blind person.

Lighting, acoustics, and smell are important in retail. They can affect people's use of retail areas, public spaces, the concourse, and platforms, with potential to impact people's comfort and overall journey experience, navigation capacity, health, stress levels, and ability to access audio and visual information. For example, spot lighting that is seen from the concourse could affect people's vision, and music from shops spilling sound onto a concourse can affect people's access to audio Public Address (PA) announcements. Some smells from some retail can also trigger adverse reactions.

Staff awareness and training also has an important role to play in widening access to the services provided from station retail units, although this is outside the scope of this document.

Image 3.45 London Bridge retail

NR Guidance Suite Reference

Retail Design Manual For Stations
NR/GN/CIV/200/06

Journey, Facilities and Platform
3.21 Retail and commercial

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3.21.2   Design considerations

It should be easy for people to identify, enter, use and leave retail spaces and facilities, and to understand how ordering, payment, and any other systems work. Entrances, layouts, counters, furniture, services and systems, and the sensory environment should be designed with a range of people in mind. All retail areas should be step free.

Retail advertising boards and screens have the potential to create visual confusion if they are placed on, behind, or close to essential visual information such as signage.

Staffed payment or service counters and self-service counters/screens need to be accessible for a range of people for various reasons, including background noise, counter heights, circulation space and the accessibility of digital ordering and payment systems.

Displays should be located to allow people to stop and look without blocking circulation. Shelves and other projections should not extend beyond the base of display units. The layout of retail displays, furniture or other items should provide adequate width and space and not restrict circulation for people with mobility aids, including wheelchair users and parents with buggies. Aisles should provide a minimum width of 1500mm, although 1800mm is preferred.

All cafe furniture should be grouped together next to its retail unit and contained within a hoarding at least 1000mm high which contrasts tonally with its background and is detectable at a low level with a long cane.

Where physical queuing barriers are used these should meet the same criteria as described for cafe hoardings and should accommodate wheelchair users. Where seating is provided, some will need to allow space for wheelchair users and people with mobility aids/prams to sit and this should be factored into the overall seating provision and layout of a retail offer.

Kiosk queues, cafe tables, chairs, advertising boards and display units should be contained within defined areas and not spill onto station platforms and concourses as this is a hazard, particularly for people who are blind or who have partial sight. Clutter such as free-standing advertising boards should not be used.

There should be an 1800mm space between the front of any service counters or tills, and any display or queue management system. Counter/till displays should be in clear view from a seated or standing position. Counters should be dual height, of 760 – 860mm and 950 – 1100mm. Card payment terminals should be usable from a seated or standing position.

The extent of any queuing systems, furniture and displays on platforms and concourses should be considered carefully within the people movement strategy for the station. These should not be located within general circulation routes.

Induction loops and where necessary amplification systems should be provided at pay points in noisy locations to assist hearing aid users, and induction loop signs should be provided.

Fitting rooms should be accessible for people with mobility difficulties and wheelchair users. Retail advertising boards, or other retail screens should avoid creating visual confusion. They should not be located where they can cause issues with people's movement or mobility, for example large advertising screens within a shop front that looks directly onto a concourse.

Customer information screens should not have to compete with retail advertising boards. Responsible persons need guidance and protocols to follow that enable them to make appropriate decisions about advertising placement, for example about where advertising is contained on concourses.

Provide a fit-out and operational requirements for tenants which includes information on inclusive design and accessibility issues relevant to the station.

Refer also to Wayfinding, Colour and tonal contrast, Horizontal circulation and Induction loops

Journey, Facilities and Platform
3.22 Staff facilities – offices and control rooms

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Image 3.46 Three Bridges ROC

3.22.1 Who and why

The Equality Act requires employers to make reasonable adjustments within the workplace when employing and retaining employees. The majority of disabled people acquire disabilities later in life through illness, accident or the ageing process. The staff who occupy an office today might not include people who identify as being disabled person, but this could change over time. It is worth noting that some people who could might be described as disabled do not identify themselves as such, for example many older people or people with neurological conditions.

Workplace environments should support the well-being of occupants as well as fulfilling functional needs for work and other functions. The accessibility and well-being needs of disabled staff should be assessed in advance where possible. Other personas and scenarios will also need to be considered such as pregnancy, hormonal conditions, and some health issues.

Employers should also provide work environments that are accessible for people with any protected characteristic, so consideration should be given to the needs of people within these groups. For example, this can influence toilet provision and provision for gender neutrality and gender specificity. It can also influence the provision of facilities that staff might seek after from a faith/belief perspective. Moreover, personal safety/security concerns can be significant amongst female staff and other staff who might fear that they could be subject to hate crime.

Journey, Facilities and Platform
3.22 Staff facilities – offices and control rooms

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3.22.2   Design considerations

Offices and control rooms should be designed to be operational 24 hours a day/7 days per week, 365 days a year. They should be designed to accommodate people with diverse characteristics and abilities in accordance with the Equality Act and BS8300-2.

To provide workplaces that are as inclusive as possible from the outset and avoid major, costly, or sub-standard adjustments at a later date, factors such as the choice of furniture, colour schemes, locally controlled lighting and temperature, the design of refreshment facilities, sanitary and changing facilities, quiet spaces and travel distances should be considered as early as possible for new designs or refurbishments.

It is essential to consider how equitable emergency evacuation will work when designing or refurbishing new staff offices or control rooms.

Operational buildings should have lifts to all floors. Ideally, a minimum of 2 lifts should be provided within the building to allow for some contingency for use of an alternative lift during a breakdown but allow for alternative directions of escape via evacuation lifts.

The lift location should take into account the circulation layout to provide staff with easy access to all parts of the workplace floor.

Each control room project should appoint a project lead for ergonomics who should coordinate liaison with operations and maintenance representatives.

An Ergonomics Integration Manager should instruct personnel to conduct analysis to develop specific ergonomic room layout requirements. The operating floor design of a control room should also require interface activities with end-user representatives from a Route Working Group and key stakeholders.

Journey, Facilities and Platform
3.23 Staff changing and sanitary facilities

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Image 3.47 Spectrum storage lockers

3.23.1 Who and why

This section discusses the provision and design of staff changing areas; for further guidance on this, refer to BS 8300-2. This section briefly discusses staff toilet provision, but does not discuss staff toilet design; further guidance on this can be found in Section 3.10 of this manual and BS8300-2.

It is important that staff performing certain roles have access to suitable changing facilities. As well as changing rooms, changing facilities may require associated toilets, showers and lockers. If toilets and showers are provided, it is generally more convenient for wheelchair users to use both toilet and shower at the same time, so ideally these would be combined.

The overall provision for each workplace will need to be carefully assessed so that both accessible and standard changing and sanitary facilities are available when staff need to use them.

It is important to include assessment of the anticipated needs of staff when assessing which provision is needed, and to factor in cleaning, maintenance and any relevant operational considerations.

NR Guidance Suite Reference
Workplace DNA NR/GN/CIV/400/05

Journey, Facilities and Platform
3.23 Staff changing and sanitary facilities

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3.23.2   Design considerations

Staff changing rooms and other sanitary accommodation should be located on accessible routes that are direct, step-free, and obstruction-free.

Changing provision, and any other associated sanitary provision should be provided for disabled staff and other staff, with a minimum of one unisex accessible facility being provided. However where there are several staff and greater numbers of changing and sanitary facilities, provision for gender specificity should also be included.

The sufficient manoeuvring space of a 1500 x 1500mm square should be provided in any changing area. This should be near the door, but clear of the door swing or any other obstruction.

Where there is a bank of lockers, some accessible lockers should be provided.

These should be suitable for wheelchair users and at least 300mm wide, not more than 600mm deep, and with their bases set between 400mm and 800mm above finished floor level.

Tonal and colour contrast should be used to help people with partial sight identify individual lockers. Locks should be located within the height range of 750 – 1000mm above finished floor level and suitable for use by someone with limited manual dexterity.

Benches should have a depth of 500mm and a height in the range of 450 – 475 mm.

Mirrors should be placed at a height range for standing and seated users.

Clothes hooks should be located at a height of 1400 mm and 1050 mm.

For further guidance on the design of changing areas, refer to BS 8300-2 and the sections within this manual that are listed in the Cross-references list below.

BS 8300-2 should be consulted for further guidance on wheelchair accessible unisex shower provision and design which would need to be combined with an accessible toilet. Accessible ambulant shower provision should be provided for use within gender specific areas. However, some key points regarding showers are:

→ Direct access should be provided between changing and any shower areas (where these are not combined in one cubicle)

→ Any water for hand washing or showering should be no hotter than 43°C at the outlet

Journey, Facilities and Platform
3.23 Staff changing and sanitary facilities

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In wheelchair accessible showers:

→   space should be provided for wheelchair users to transfer to a shower seat

→   A shower seat and a drying seat should be provided.

→   Adjustable height shower heads should be provided for people who use a shower at seated height

→   There should be no upstand between the dry and wet area within accessible shower rooms or areas

→   Sufficient manoeuvring space of a 1500 x 1500mm square should be provided in any shower area. This should be near the door, but clear of the door swing or any other obstruction.

If toilets are provided for staff, then a Diversity Impact Assessment (DIA) should be undertaken to help determine the number of toilet cubicles that should be assigned to male and female toilets to avoid any staff having to wait for an overly long time to use a toilet; this is particularly important for staff who need to use a toilet when taking shorter work breaks.

The needs of wheelchair users and ambulant disabled people should be factored into all and any types of assessments that are undertaken to assess:

→   Which staff toilet provision should be provided

→   Where it should be located

→   How it will be cleaned and maintained

→   Any other operational issues

It is important to understand that where toilets are provided for staff, a minimum of one unisex wheelchair accessible toilet should be provided. For other design guidance on toilets, refer to Toilet section of this manual, and BS 8300-2.

Image 3.48
Paddington Station Concourse

4

Fixtures and Fittings

Fixtures and Fittings
4.1   Seating

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4.1.1   Who and why

The mobility capacity of people can vary significantly, and be much affected by topography, weather, crowds of people, and other factors. Other people's capacity to navigate and use routes, buildings, and outdoor spaces might vary depending on internal and external factors, such as people's capacity to deal with sensory input when stations are busy.

Carefully placed accessible seating is needed by people to rest and recover at reasonably frequent intervals, and for a range of reasons, including:

→ People with mobility difficulties to stop and rest.

→ People with neurodiverse conditions or any other accessibility needs who need a rest from navigating, wayfinding, crowds and other sources of sensory input.

→ People who need to be seated to undertake wayfinding (use a phone/ticket, etc), such as some people with neurological conditions, mobility difficulties, or blind or partially sighted people.

→ Carers of people of any age, to communicate, organise clothing/refreshments etc, whilst being stationary and out of circulation routes.

→ Wheelchair users might need or want to transfer onto a seat.

The location, design, and visual and tonal contrast between furniture and its background might affect whether people with blind and partially sighted people can identify and avoid the furniture.

Image 4.1 Satisfied rail passenger sitting on new seating at Victoria station

Image 4.2 Wheelchair user

Image 4.3 Children on seating

NR Guidance Suite Reference

Station Facilities and Amenities
NR/GN/CIV/200/03

Fixtures and Fittings
4.1   Seating

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4.1.2   Design considerations

It is important to assess seating location, placement, and design in relation to people's varied needs and their overall journeys. Rest points will be useful at key locations, such as near station entrances, at meeting points, near journey interchange points including mobility hubs, and near information and at waiting locations. Seating and rest point provision should nevertheless aim to provide for 10% of passengers waiting during peak times.

Seating should be provided close to pedestrian routes and where passengers may wait, such as on platforms and concourses. Travel distance between seats/rest points should be no less than 50m on accessible routes, platforms and where passengers are expected to wait. On long bridges and subways, seating and rest points should also be provided at regular intervals of no less than 50m.

Some accessible seating for public use outside and within stations could be considered in relation to their capacity to provide places of relative quiet.

Hours of access to seating options (such as waiting rooms) should be factored in when looking at seating placement and people's overall journey routes.

Seating should be close to general circulation routes and placed so that seats themselves, seated people, wheelchair users, prams and luggage do not obstruct routes. A clear space of at least 900 mm x 1350mm should be provided, preferably at both ends of a bench, to accommodate waiting space for wheelchair users or a pram. Maneuvering space of 1500mm square should also be provided to enable movement into such waiting spaces

To avoid confusion and collisions, furniture should be carefully placed and designed, and have tonal contrast with its' background to help make it visible for partially sighted people. Seating should be detectable at low level by long cane users, and edges should be rounded to avoid injury in case people collide with the seat.

Seat finishes should not be highly reflective, and ideally should not be cold to the touch.

A mix of seat heights should be provided where several seats are provided in one location. Where only one seat is provided the seat height should be in the range of 450 – 480mm. When there is more than one seat a range of seat heights, 450, 480 and 580mm should be provided.

A significant proportion of seats should have back and arm rests. Arm rests should contrast tonally with the seat and backrest. A further proportion of benches should have arm rests should be set in 500 – 750mm from the ends to allow wheelchair users to transfer onto the bench.

Section 3.8 of this manual provides further information on waiting areas.

Refer also to Colour and contrast, Passenger circulation, Quiet spaces, faith, Well-being rooms, Waiting rooms, Assisted travel lounges, Lifts, Acoustics, Platforms, Ticket and information counters and Bridges and subways

Fixtures and Fittings

4.2 Doors

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4.2.1 Who and why

Doors can present a barrier to many building users and should only be provided where absolutely necessary. Where doors are present, people who are partially sighted and who have specific neurological requirements should be able to easily find and identify the door within a wall or entrance façade.

The following need to be carefully thought through:

→ The logic and predictability of door locations/placement,
→ Adequacy of clear door opening widths,
→ Adequacy of clear spaces to the leading-edge side of doors,
→ Operating forces and any necessary powered operation,
→ Associated lobby arrangements and layouts.

This is so as to address potential difficulties that could be experienced by some people when it comes to independently navigating through a station and using its facilities.

Doors can also obscure sight lines, which can have impact for people's experiences and feelings about personal safety/security. Consequently, if doors are not needed (and are therefore omitted) or if they can be glazed / have vision panels, this can help increase natural surveillance.

Automated sliding doors are preferable over other door configurations. Revolving doors exclude many disabled people including people with assistance dog users, and hinder people with children, prams and luggage. Revolving doors, combined with an associated pass door, tend not result in an equitable nor satisfactory solutions with pass doors being used by more people than intended and thereby negating the draft exclusion intention of revolving doors.

Swing doors can require significant strength and manual dexterity to open, if not power-operated or automated. The space around swing doors can also have an impact on how easy and/or safe they are to use.

Wheelchair users and people with mobility aids might be unable to use swing doors if there is inadequate space on the leading edge of the door, or if lobby space does not accommodate people whilst being clear of door swings. This can also be the case for parents with pram and people with luggage.

Leading edges of doors can also present a hazard, particularly for people who are blind and partially sighted. If used, swing doors might need to be power operated and careful consideration given to avoiding locations where they might lead to people colliding with doors.

Image 4.4 Contrasting station door and framing

Fixtures and Fittings
4.2 Doors

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4.2.2 Design considerations

Door thresholds should ideally be level.

Doors should be readily identifiable from the surrounding walls or surfaces, contrast visually with surrounding wall and floor finishes and achieve a difference of at least 30 points in light reflectance value (LRV).

Door furniture should contrast visually with the door, with a minimum of 15 points LRV difference between the two.

Glazed doors and screens with large areas of uninterrupted glazing require manifestation in accordance with BSS8300-2:2018 guidance, that contrast visually with the background on either side of the door. Vision panels should be provided within doors in regular use, (unless for reasons of security, privacy or functionality).

Entrance doors and lobby doors associated with entrances should provide a minimum clear width of 1000mm. Internal doors should provide a minimum 900mm clear opening width, and for double-leaf doors at least one leaf should meet this requirement.

A minimum clear space of 300mm should be provided on the leading-edge side of the door (i.e., between the latch side of the door and the nearest obstacle) on both the push and pull side of the door.

Doors on obstacle-free routes, footbridges and subways should ideally provide a combined 1600mm clear width opening.

Lobbies between doors should be avoided unless necessary for the management of drafts or security. Where required, they should enable someone using or pushing a wheelchair user to clear one door before opening another door.

Doors should provide maximum opening forces in accordance with BS8300-2:2018. This can be difficult to achieve on entrance doors owing to wind and/or differential air pressure, therefore power operation and/or automation should be provided in such situations.

Door ironmongery and its placement should enable people to open a door using a clenched fist in a single operation, from a seated or standing position. Thumb-turns (even with levers) are rarely satisfactory. Lift-to-lock mechanisms for sanitary doors or panic levers (that release key operated dead locks and latches from inside a room and in one operation) are far more preferable.

Further guidance can be found in BS 8300 Part 1 and 2.

Standards Reference

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 and 2

Fixtures and Fittings
4.3 Handrails

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Image 4.5 Victoria Station Handrails

4.3.1 Who and why

Steps can be difficult to negotiate for some people, especially children, people of short stature, older people, blind and partially sighted people and people with upper and/or lower body mobility difficulties. Similarly, for some people, ramps can also pose a challenge. Handrails, therefore, make it safer and easier for people to negotiate changes in level.

Some people use handrails for balance, support, or guidance, whilst blind and partially sighted people also use handrails to identify where changes in level begin and end.

Some people have greater mobility on one side of their body than the other. It is therefore important that handrails are designed to be continuous on both sides and on landings, apart from where breaks are necessary for connecting doors and circulation.

Children and people of short stature benefit from lower height handrails. Handrails that project at the top and bottom of stairs enable people to steady themselves before and after negotiating a flight of steps.

Visual clarity of handrails helps partially sighted people navigate and find where they can gain support when negotiating steps and ramps.

Care should be taken to provide handrails in the right locations inside and outside buildings, and are easy to identify, grasp, follow, and use.

Fixtures and Fittings
4.3 Handrails

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4.3.2 Design considerations

Handrails should be capable of supporting the full load of users and should be provided on both sides of steps and ramps.

Handrails should be continuous for the full length of the stair or ramp. Where there are central handrails these should break at landings.

The ends of the handrails should project horizontally beyond the top and bottom of the steps/ramp by at least 300mm for the length of their horizontal section and should be designed to prevent bags or clothing being caught on any projections.

On stairs wider than 4m an additional central handrail is required. The current (2015) DfT COP states that ramps wider than 2.5m require a central handrail but this contradicts the preference to have an unobstructed clearance of 1.6m minimum (which would imply a ramp of 3.2m minimum). It might be preferable to avoid central handrails on a ramp for safety reasons and a dispensation may be required based on the latest BS8300.

Handrails should be round or oval in profile and comfortable to grip, with adequate slip resistance. Handrails should not be excessively cold or hot to the touch, since people with arthritis, poor circulation and certain health conditions can find cold surfaces painful to touch.

Handrails should contrast visually and tonally with the background they are seen against. The surface finish of handrails should be matt to avoid glare.

Support brackets should not interfere with the gripping surface and there should be adequate space between the handrail and the wall.

Handrails should be fixed at 900 – 1000mm above the surface of the ramp or pitch line of the stair. At landings the handrail should be at 900 – 1100mm above the finished floor surface.

Additional lower handrails should be positioned at 600mm above the surface of the ramp or pitch line of the stair.

Nevertheless, it is also important where additional handrails are provided that climbing risk and associated hazards are also assessed and that, where necessary, guarding is extend upwards.
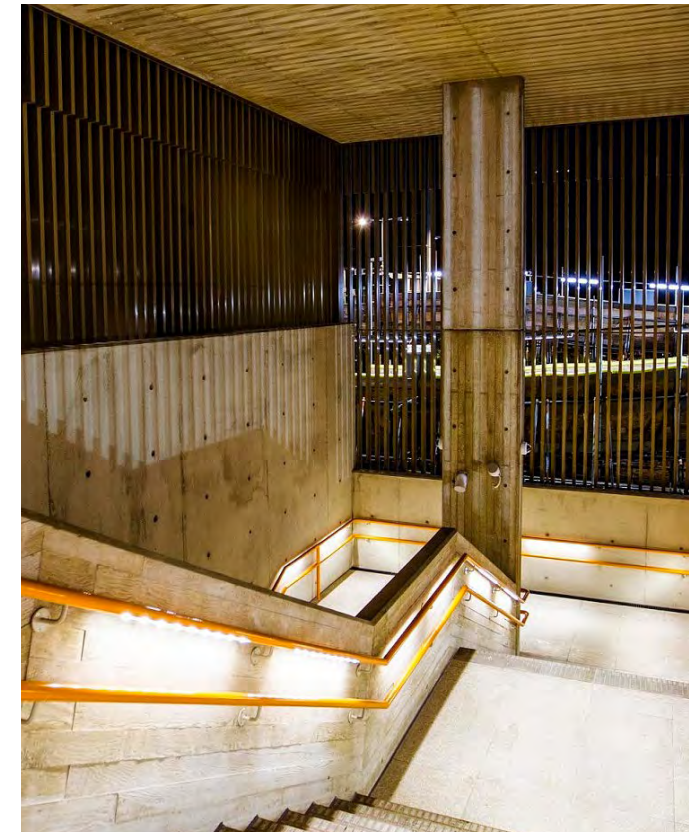
Image 4.6 Hackney wick stairwells

Fixtures and Fittings
4.4   Glazed screens and balustrades

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Image 4.7 Glazed Screens

4.4.1   Who and why

Typically, glazed screens and balustrades are specified in station environments to provide create clear sightliness which aide intuitive wayfinding, aide security surveillance, and enhance people's perceptions and experience of personal security.

Poorly designed glazed screens and balustrades, however, can present a hazard and/or problematic for some staff and passengers, particularly for people who are partially sighted or have particular neurological needs pertaining to visual processes. This is because:

Glazing can be hard for some people to see and can generate glare from the sun and reflections from artificial lighting.

Glazed screens that have fully glazed frameless doors are hard to identify when closed, or hard to see when open.

Glazing without some degree of obscuring at floor edges can also open people up to a sense of vertigo.

Fixtures and Fittings
4.4   Glazed screens and balustrades

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4.4.2   Design considerations

To enable glazed screens and balustrades to be easily identified, they should have permanent visually contrasting manifestations within two zones, between 850mm and 1000mm, and between 1400mm and 1600mm above floor level.

Where handrails are applied to glazed balustrades they may function as manifestation. However, whilst taking into account the benefit and need for good sight lines, additional obscuring of glazing may also be needed, so as to lessen the potential of people experiencing vertigo, especially where it would be difficult to avoid people having to coming close to a glazed edge balustrade.

In all light conditions, manifestation should provide visual contrast with the surface behind and may typically take the form of a continuous or broken line or logo patterning on the glass. They should not however be of a design that creates visual noise, such as when highly repetitive vertical lines or other visually noisy patterns are used.

Fully glazed frameless doors should be avoided. However, if glazed frameless doors are used, they should be designed so they are clearly identifiable on the approach from both sides and can be visually distinguished from the adjacent glazing. The edges of glass doors should also be clearly visible when the door is open. These requirements for visual clarity would usually mean applying visually contrasting surfaces to the glazing.

Image 4.8 Bolton Station Coffee Shop

Image 4.9
Customer Information Screens

5

Operations, Communication, Digital

Operations, Communication, Digital
5.1   Wayfinding

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5.1.1   Who and why

Good wayfinding assists passengers with undertaking their journeys efficiently, comfortably, conveniently and safely.

Wayfinding provision includes directional, orientation and identification information and should enable a range of personas and scenarios to orient themselves and navigate from place to place safely, including from a range of station arrival points. Provision can incorporate maps, signs, directional markers and acoustic clues, and should be applied in a coherent and consistent way. Consistency is particularly important for people who are blind, partially sighted and people with neurological conditions.

As with other features and elements that support inclusive use, wayfinding provision and design should use the principle of aiming to support at least one of several available senses, where possible. Usually this includes visual and tactile/cane detection. With the arrival of digital technology, however, the auditory sense could now also be more readily available.

Cane detectable edge features are often sought after by blind and partially sighted people to navigate environments and the availability of cane-detectable edges to routes are especially important. Significant care is needed with regards to the appropriate use of tactile surfaces underfoot. For situations other than warning or enabling people to navigate across large spaces, the overuse of tactile surfaces can lead to significant problems of confusion, discomfort, and hazards for a variety of users.

Other elements of rail environments also support people's wayfinding, such as consistent lighting, acoustics, colour and tonal contrast (for features such floors, walls, doors, ironmongery, handrails and Help Points), communication systems such as induction loops, and logical door and seating placement. There is opportunity for increased interaction between wayfinding and digital technology and this is discussed further in Wayfinding Design Guide (NR/GN/CIV/300/01).

Wayfinding provision should work well for people who are Deaf, hard of hearing, blind or partially sighted, have neurodivergent conditions, and for tourists or people who do not speak English as a first language. The use of universally recognizable international symbols may also help support people who use communication systems that utilise visual symbols, especially as some people use as Makaton and other symbol-based systems.

People who are hard of hearing may face communication barriers when seeking verbal information or listening to PA (Public Announcement) systems. Consequentially clear visual information will help people navigate without having to rely on auditory communication.

People who are blind or partially sighted may rely more on tactile and audible information systems and cues, including cane-detectable guidance elements, braille and digital information systems.

Wayfinding provision, along with overall route designs and layouts should aim to deter people who are blind, partially sighted, with neurological conditions, wheelchair / pram users, and other people with mobility impairments from unknowingly proceeding on routes that lead people towards a hazard or have 'dead ends' and where they could get stranded, for example routes that taper out where wheelchair users could find it difficult to turn around.
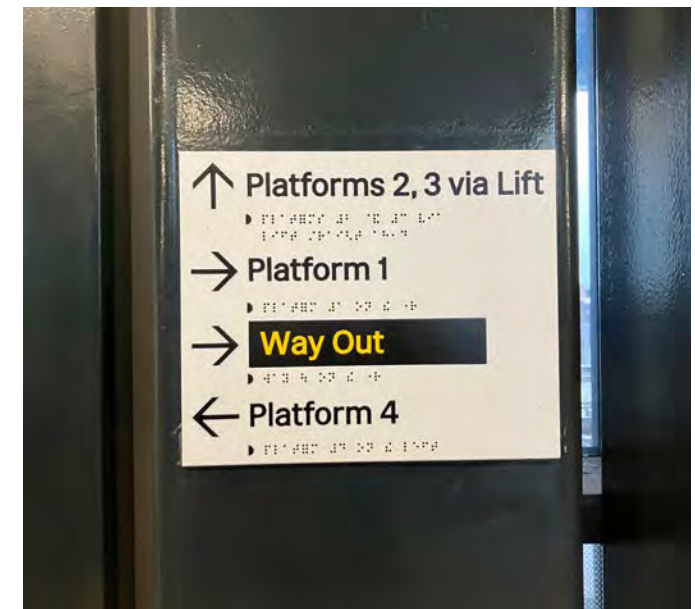

Image 5.1 Coventry Station Wayfinding Sign

Operations, Communication, Digital
5.1 Wayfinding

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5.1.2   Design considerations

Wayfinding provision including formats and content should be assessed from the perspective of a range of user needs. The persona narratives and scenarios methodology can be used to undertake or support this process. The principle of designing for two senses or more should be followed.

Wayfinding provision should enable decision making as early as possible. Key location information should be provided, including sign directories, orientation signage, maps and plans in visual and in tactile form, and with audible and large print information where possible and applicable. This should include information on access provision including accessible/ non accessible routes, toilets, help points, ticket and information counters and assistance lounges.

All types of signage and information boards should contrast tonally against the background they are seen against, and text should contrast tonally against the sign boards. However, care should be taken to avoid excessive contrast. Black on brilliant white can be difficult for some people to read comfortably.

If there is a system by which train configurations can easily be communicated through visual displays and auditory announcements, numbered boarding point markings on platforms can be used to direct people who have need of particular facilities to the most advantageous location on the platform for accessing the most relevant carriage for their need.

Designers should follow these principles relating to signage:

→ Consultation with specialists and potential users is advised during the design and procurement of station passenger signage.
→ Keep placement and design consistent throughout station environments.
→ Consider lighting for signs and seek specialist advice on this. Signs should be evenly lit, and backgrounds, glare, reflections and shadows should not interfere with the reading of signs.
→ Placement, incorporation, and design of directional arrows should offer clarity as to which direction they are sending people in.
→ Text should be concise.
→ Upper case text is comparatively harder to read. Text should therefore be in easily read type and in title or lower-case text.
→ Dot matrix display systems should not be used.
→ Wayfinding provision should not rely solely on text, and assessment should be undertaken of where recognised symbols and pictograms could and should be applied.

Advertising and non-wayfinding information can be distracting and cause confusion for some people. Digital advertising material, large screens, ordering screens within retail units, and particularly screens with moving images can be especially distracting for partially sighted people and people with neurological conditions.

Advertising and Train Operating Company branding should not therefore conflict or distract from station wayfinding. In practice, however, this can be difficult to achieve unless there are strategies to overcome this. Such strategies may include vertical separation or assuring wayfinding and advertising are not viewed in the same direction, but that advertising is rotated through 90 degrees to the relative direction to which wayfinding information is viewed.

Refer also to Station facilities, Passenger circulation, Platforms, Lighting, Acoustics, Colour and tonal contrast and Induction loops

NR Guidance Suite Reference

Wayfinding Design Guide
NR/GN/CIV/300/01

Tactile Wayfinding and Paving
NR/GN/CIV/300/06

Standards Reference

Design For The Mind - Neurodiversity and the Built Environment - Guide
PAS 6463:2022

Design of An Accessible and Inclusive Built Environment - Part 1 and 2
BS 8300-1 and 2

Operations, Communication, Digital
5.2   Display screens

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5.2.1   Who and why

Display screens on concourses, platforms, waiting areas and in some instances outside stations, provide passengers with real-time information for train departures, arrivals, destinations, platform allocations and delays. They include what are commonly referred to as Customer information Systems (CIS) but may also be used for other purposes as well. They should also convey the equivalent to what is being said in auditory form.

Typically, display times are set to correspond with the amount of information that is meant to be read and understood. However, people with neurodiverse conditions or who are partially sighted need more time to read and understand information before it changes. This is also important for people who are Deaf or hard of hearing as they will/may have limited access to PA announcements and are therefore likely to rely more on visual information.

In some instances, owing to the diverse needs of recipients of visual information, consideration may need to be given to providing separate screens to that of train departures etc., so that people have sufficient time to take in announcements. Although currently over and above the scope of the regulated parts of conventional emergency alert systems, there is also merit in being able to communicate emergency messaging on screens when the need arises.

Display screen location and placement should also help enable people entering the station to work out and take the most direct route to their platform. Although people may go directly to their platform, they may also use other station facilities on the way. Ideally, people should be able to take the most direct routes and not have to do additional walking due to poorly placed information or signage. Ease of navigating, and the directness and length of routes will also depend on the overall quality of wayfinding provision and on overall station layout.

Glare can be a major cause of discomfort and reduce information legibility, particularly for people who are partially sighted, and/or who are sensitive to bright sources of light, and therefore particular consideration should be given to avoiding such occurrences.

Some people will benefit from being able to view display screens whilst also being well away from crowds and main circulation routes. For example, some people with hearing impairments, neurological conditions, or people who need to communicate with their companion(s) will need a quieter/more low-activity space.

Provision of low-level screens, where suspended screens are also used, are likely to benefit wheelchair users, people of short stature, and people who find it difficult or uncomfortable to look up for long periods of time.

Image 5.2 Customer information screens in St. Pancras Station

Operations, Communication, Digital
5.2   Display screens

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5.2.2   Design considerations

The main display screens should be provided near an arrival point (such as in a station concourse) and supplemented by summary boards and information screens strategically located on platforms and in waiting areas so that passengers are never too far from up-to-date information. Benefit may also be had by providing display screens outside the station, especially where there are multi-modal transport interchanges. However, where real-time information on differing modes of transport is displayed, it should be clear which transport mode the information relates to.

Dot matrix information screens should no longer be used as visual intensity of each dot and the associated visual noise effect of the lettering can hinder readability, especially by people who are partially sighted or who have some neurological conditions. Consequently, plasma or LED screens should be used. Where the text of departure screens are coloured, any emergency or programmed announcements should use text or backgrounds of a different colour, whilst providing sufficient tonal contrast.

Display screen design, locations and placement should:

→   Be visible in key locations, such as close to points of arrival into the station, on platforms and in quieter waiting rooms and assistance lounges.

→   Include locations that are visible from some low level and accessible seating so it can be viewed by people who cannot stand for long periods of time, or who are of short stature/ wheelchair users.

→   Provide sufficient luminance contrast between the display screen text and its background to improve the quality of the display. It should also meet the contrast standards described for fixed signs.

→   Reduce the incidence of glare arising from daylight, sunlight, lighting located behind and beyond screens, reflections and from screens themselves. The latter can occur where illuminance contrast is too great.

→   Be manufactured from a material that is as matt as possible to help reduce veiling reflections that obscure sight of information.

→   Avoid locations close to advertising screens, which can create visual overload and make it difficult for some people to read.

To help alleviate glare, it is recommended to avoid mounting screens where they are within the same field of view as other light sources, or areas of external glazing. Mounting plasma or LED screens at a lower level on the main concourse may also help to reduce reflections and reduce direct glare from roof lights.

Any low-level screens should also be mounted consistently at next to the ticket counters or near customer information desks where provided. If feasible, it is recommended that consideration is also given to providing low-level screens where high level suspended screens are used. Care should be taken so that they are not obscured by queues and do not present potential collision hazards.

Image 5.3 Thameslink CIS Screen

Operations, Communication, Digital

5.3   Audio induction loops

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5.3.1   Who and why

All passengers need access to the same journey information and some passengers may need extra information so they can plan, undertake and complete their journey in safety and comfort. Accessing and processing travel information/announcements is very important if people are to remain confident during their travels.

One in six people in the UK have some form of hearing loss and this is expected to rise with the ageing population. More than 900,000 people in the UK are severely or profoundly Deaf. Sense believes that there are currently over 450,000 deaf-blind people in the UK, who have loss of sight. Furthermore, there are people with neurological conditions who can find processing auditory information difficult. However, stations can be noisy environments, and this can therefore further impact people's ability to process information that has been transmitted in auditory form.

Audio-frequency induction loop systems allow hearing impaired people who use particular types of hearing aids to hear more clearly. Most hearing aids have a 'T' or 'MT' switch that allows the aid to pick up the electromagnetic field generated by an induction loop system. The hearing aid converts this signal into a sound suited to its user's specific hearing requirements.

An induction loop system transmission, combined with the use of hearing aids, helps users to filter out background noise, competing sounds, reverberation and other acoustic distortions that reduce clarity of sound. Even so, whilst induction loops are helpful for many it is important to note that for some people hearing aids are of little help and therefore good acoustics and the provision of information in visual form are just as important as induction loops.

Wherever public announcements are made or verbal interaction is required, induction loops should be provided, such as where Public Address (PA) announcements are made and at service desk counters. They will also be needed at Help Points, Emergency Voice Communication call points and Samaritan phones. Induction loops may also be needed within staff facilities.

Whether or not induction loops are working, and whether staff are even familiar with their use, purpose and function is often doubtful. Staff education/training, and supervision and support should therefore enable smooth use and maintenance of induction loop systems and ease of overall communication for people who need use of induction loops. Where possible, indicator lights should be clearly visible to staff to indicate whether induction loops are operating as in intended. Visibility of such indicator lights to passengers should give further confidence to hearing aid users.

Image 5.4 Audio induction loop

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5.3   Audio induction loops

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5.3.2   Design considerations

The design of environments that will support good communication is necessary, whether or not people use hearing aids and have need of induction loops. The principle of designing for two senses or more should be utilised in overall station design. Good signage, lighting and general acoustic design are important for people who are Deaf, hard of hearing and have a variety of neurological conditions, to support ease of orientation, communication, and use of station facilities. These deign considerations are also important for blind and partially sighted people too, and who may have impaired hearing also.

Where public announcements are made or verbal interaction is required, induction loops should be provided. All public address systems and customer interface points should be linked to induction loops that cover the main public areas of the station including ticket office, waiting rooms and assisted travel lounges and around Customer Information Systems (CIS). Induction loop provision should be clearly signposted so that users know:

a.   That these systems have been installed

b.   Where the systems are, and when people are in an area where they can switch their hearing aid to the 'T' or 'MT' setting.

Induction loops may also be necessary to aid communication at gate lines / ticket barriers to communicate with staff that are present in these sometimes noisy environments.

Customer information counters, service desks, Help Points and other information points should be equipped with hard-wired induction loop systems. Other areas in staff accommodation may need this provision as well, such as reception desks, or meeting or control rooms.

Multi-disciplinary coordination should happen from an early stage, for example with wayfinding, acoustics, interior design, lighting, and other relevant disciplines. For example, induction loop signage should not be obstructed or crowded by other visual information or objects such as information boards etc. Acoustic and interior design are also important for supporting ease of listening and lip-reading at key communication points.

It is also important that designers converse with those who will be in charge of operating the station and who are responsible for communication strategies and training.

When selecting induction loop locations and planning/ undertaking induction loop installation, designers and station operators should carefully consider whether areas where induction loops will be needed are likely to experience electrical interference. This should be considered at an early project stage and specialist advice should be sought from an Access Consultant and induction loop specialist, who may be needed to help establish feasible locations or solutions for induction loop provision, installation and maintenance. In some instances, induction loops for announcements may need to be very localised and associated with induction loop listening points. Such listening points should be present where people are likely to be waiting and associated with Customer Information Systems (CIS).

Refer also to Lighting, Acoustics, Wayfinding and Floor and other surfaces

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5.4 Public address and voice alarms

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5.4.1 Who and why

Public Address (PA) and Voice Alarm (VA) systems are key functions within stations. A VA system works in conjunction with fire detection and protocols for other emergency scenarios. PA and ideally VA systems should work in conjunction with Visual Displays used as part of the Customer Information Systems.

Clear PA announcements for train departure times, platform allocation and destination are essential and need to be conveyed to everyone, including people who may not see information or what is happening around them, or may not be able to hear clearly.

VA messages need to be clearly conveyed to everyone to assure the safe evacuation of all passengers and staff, whether due to fire or other incidents. VA systems are significantly preferable to other alarms such as sirens, as VA systems usually inform people calmly, whereas sirens can cause stress, especially for people with some neurological conditions.

When traveling through a railway station, finding the correct platform and boarding the right train can be a stressful experience for everyone, however this can be even more challenging for many passengers with mobility difficulties, and sight, hearing and/or neurological conditions, and their companions and carers.

The clarity and legibility of announcements is particularly important for:

→ People who have little or no access to visual information, such as people who are blind, or partially sighted (who may have a limited level of access to visual information and announcements).

→ People who are Deaf, or who are hard of hearing (who may have a limited level of access to auditory information and announcements).

→ People who have neurological conditions such as sensory processing difficulties, autism, dyslexia, dyspraxia or dementia and/or mental health conditions such as anxiety etc.

→ People for whom English is not their first language.

Clear announcements are also important for people who need to pay close attention to immediate route features, their mobility, or a companion. For example, carers may be looking closely at the adult or child they are accompanying, or someone with a mobility difficulty may be focusing on using steps safely, so may find it easier to access audio, rather than visual announcement at some moments of their journey.

Image 5.5 Crossrail Refuge Point Evacuation Test

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5.4 Public address and voice alarms

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5.4.2 Design considerations

Speakers for PA and VA systems should be placed frequently throughout the station so that the sound of announcements reaches all public areas. Speakers should be away from reception areas and should be appropriately volume-adjusted/ adjustable to enable staff to communicate with passengers whilst announcements are being made.

Emergency announcements followed by live audio announcements made by staff should be given priority over normal timetable announcements. Live announcements may consist of timetable variations, platform alterations, cancellations or late running information, and details of longer distance or special services.

The content of any audio announcements should also be visually displayed on departure screens. This is to inform people who cannot access audio/ PA information that something has changed, so they can seek assistance if needed.

This might include people who are Deaf or hard of hearing, or do not speak English as a first language. Where the text of these departure screens is coloured, the emergency announcement should use text of a different colour.

Emergency alarms should be both visual and audio. Flashing beacons can be helpful, but their selection, application and management requires specialist advice as they contain potential negative safety and health implications.

Any devices or systems should not disadvantage people with epilepsy, or cause issues for others, for example people who are partially sighted or have neurological conditions and who could suffer adverse health impacts, or become confused or disoriented.

All systems that relay recorded or live information such as help points and ticket information counters should be equipped with an audio-frequency induction loop.

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5.5 Help points

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5.5.1 Who and why

Passengers with need of assistance can book assistance in advance of their journey through the National Rail Enquiries website. Under the national regulations, station managers or another authorised person should provide designated points within or outside railway stations, at which a person requiring assistance can announce their arrival at the station and seek assistance if required.

We want our all our customers to have easy access to our stations and trains and to enjoy an inclusive and equitable journey experience. Passengers should be able to plan and complete journeys knowing that they can access essential information, call for help in an emergency and/or ask for assistance on their journey, for example on arrival to a station or train platform. Help Points are particularly useful at unstaffed stations/locations, or where other communication systems are not yet provided or are out of service.

Help Points are usually round, white panels. It is important to appreciate that they are a different product to the Emergency Voice Communication telephones that are provided in refuge locations. Emergency Voice Communication telephones exist solely to aid the emergency egress process for people who need assistance to evacuate.

Help Points are should be provided at stations to fulfil the following functions:

a. **Information** - to provide passengers with equitable access to train and other information, as staff are not always available to provide in-situ information,

b. **Assistance** - so people can notify station staff of their arrival at a station entrance/platform and to seek booked or impromptu journey assistance, and

c. **Emergency** - for security and safety purposes, with the 'Emergency' button connecting people directly with somebody who can direct them to the appropriate emergency service.

Some people might encounter barriers if Help Points are not located where people might need help, such as in stations that are currently not entirely step-free. This can be further exacerbated if Help Point design or signage is lacking/inaccessible, or if maintenance issues occur. People who might encounter barriers if Help Points are not adequately located or designed, include:

→ People who need to access pre-booked Assistance and cannot easily find ways to contact staff on arrival to a station or platform.

→ People who need impromptu assistance, for example a wheelchair user/someone with a mobility difficulty who finds a lift out of order on arrival to an unstaffed platform.

→ People with vision and/or hearing requirements and those with neurological conditions such as dementia, who might need assistance with navigation, or other journey information.

→ People with particular ergonomic requirements in terms of reach, height, pressure required to operate buttons.

→ People for whom English isn't their first language.

It is important to consider Help Point provision in relation to personal safety and security, as various people might find some places more usable if they were aware of Help Points as immediate sources of support. This might include women, teenagers, children, and other people who are more at risk of threats to their personal safety. Help Points will also be especially important in areas with low levels of passive surveillance and in terms of offering help to people who are feeling suicidal.

Image 5.6 Emergency Help Point

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5.5　Help points

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5.5.2　Design considerations

During the early stages of planning, a customer information strategy should be developed and should include assessment for the provision and location of Help Points. Help Points should also be provided where this will support strategies and measures relating to personal safety/security.

People who need journey assistance, information or emergency help should be able to seek assistance and/or notify station staff of their arrival when using all travel modes, including trains, walking, cycling, public transport, coach/bus, taxi and public vehicle drop-off points, Blue Badge and other parking. Help Points should therefore be provided at arrival points, on platforms, in concourses and/or near accessible facilities and waiting areas, and in areas of intermodal interchange.

For arrivals from outside the station, Help Points that are close to and clearly visible from several arrival points may be sufficient. However, as not everyone can easily see/identify such Help Points, any Help Points serving those who arrive at a station other than via train, should be most identifiable close to Blue Badge parking and taxi/ vehicle drop-off points and located close to the principal access route, via which people are most likely to pass when seeking assistance. Even so, in some scenarios there is merit in providing several Help Points at busy stations with multiple and dispersed modes of arrival.

Help Points and people using them should not impede circulation routes. Consideration should be given to the space needed for wheelchair users, and carers of adults or children who may need to stand close to their companion/a pram.

Clarity of sound is important. Customers should be able to talk directly to enquiry offices/other points of assistance. They should not become stuck with a call centre or need to talk to a series of people (where this can be avoided) as this can be confusing. Staff should always be able to answer calls when rail services are in operation at the station, and staff should be clearly audible. Staff may not know what the acoustic conditions are at the Help Point location, as these are changeable. Design and placement of Help Points should mitigate against adverse effects on audio communication from noise sources such as trains, crowd, wind etc.

Help points should be easy to locate and identify, and easy to use for anyone who might need them, including people of all ages, with differing visual, auditory, mobility, height, reach dexterity and language requirements. The placement and height of Help Points should enable wheelchair users/people with mobility difficulties and different heights to use the product. As such:

→　Controls and working parts should be located within the range of 700 mm and 1200mm from the ground.
→　Minimum force should be required to operate the controls.
→　The buttons should tonally contrast with their background and their functions should be described both in text and tactile form.
→　Buttons should have a minimum diameter of 20mm, should contrast with the background and have their functions described both in text and tactile form.
→　A light should confirm to hearing impaired people that their call has been answered.
→　Newly installed Help Points should also be fitted with audio induction loops. Old Help Points should have induction loops fitted during maintenance programmes.
→　Help Points themselves should tonally contrast with their background to make them more visible.

Consideration should also be given to both the format and languages that Help Point information is in, and other functionality that will assist Help Point use. For example, the auditory volume of speakers used to communicate with users will be a significant issue for many people. Functionality that enables touch free operation would also further enable independent use.

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5.5   Help points

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5.5.2   Help Point Design

It should be made clear to users with a range of communication needs which button is for which function. Typical white round Help Points, however, do not usually make it clear which button to press if one requires assistance. The design of the Help Point and at least any information accompanying it, should make this clear. Any such information needs to be available in accessible formats.

This is important to help people easily understand which button they need to get through to the right service, for example:

→   To seek passenger assistance, for example pre-booked assistance to buy a ticket and board a train.

→   If a passenger has a concern about another passenger on a platform, for example a concern that someone might be suicidal.

People with mobility difficulties may find it difficult to stand for long periods of time so responses should be prompt, and seating or perch points should be considered where this is feasible. Designers should assess the need for seating close to help points, including any potential safety or operational risks relating to these.

Help Points should be accompanied by specific CCTV coverage as part of the overall comprehensive CCTV coverage requirements for stations. However, careful consideration ought to be given to whether CCTV is likely to deter use by someone who is feeling suicidal and wishing to communicate anonymously.

It may in certain circumstances be appropriate to provide information adjacent to Help Points on where a Samaritan phone is available in a more discreet location outside the station. Even so, information accompanying Help Points should inform callers that they can be put in contact with services such as the Samaritans via the Help Point.

It may sometimes be appropriate to provide map/directional information on where alternative Samaritan phones can be found outside the station, from where individuals may call Samaritan services.

Image 5.7 General Help Point

Refer also to Platforms, Arrival, Public realm, Acoustics, Section 1 and Emergency egress

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5.6   Emergency evacuation

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Image 5.8 Typical assembly point signage

5.6.1   Who and why

Means of escape, means of alerting people, fire protected routes, fire protection systems and evacuation strategies, should be integral to the architectural concept.

Section 1 of this manual stresses the importance of Emergency Evacuation and highlights some of the key issues to consider. The reason for this is that some people can be especially vulnerable during emergencies and most vulnerable to inclement weather at smaller, more remote, exposed, and unstaffed stations. Consequently, the aim should be to enable independent evacuation wherever possible, especially at unstaffed stations.

It is also important that when developing fire and life safety strategy that due care and attention is given for inclusive design principles and the safe evacuation of all passengers and staff, whilst considering people's diverse mobility, visual, auditory, and neurological needs.

Where independent egress is not possible then careful attention needs to be given to how assisted evacuation will work in practice. Training of staff and likely response times to an incident will be key considerations.

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5.6   Emergency evacuation

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5.6.2   Design considerations

Particular attention is drawn to BS 9992:2020 - Fire Safety in design, management, and use of rail infrastructure 2020 - Code of Practice and the need to address the issues raised therein. Meanwhile, from an inclusive design perspective the design aim should be wherever possible to facilitate independent level egress of all people and where this is not possible, the aim should be to fully anticipate the design, operational, training and communication implications of assisted egress.

The necessity for providing self-evacuating lifts has to be established as part of the station's fire strategy. This might be the preferred solution, especially in stations that cannot always have trained staff who can help passengers to negotiate steps or other evacuation measures.

All escape routes should be clearly signposted, including level egress routes to final exit points or to refuges / muster points.

There should be inclusive means by which people can be alerted to a threat - whilst taking into account of people for whom English isn't a person's first language and people who are blind, partially sighted, Deaf, hard of hearing, and/or people who may experience significant sensory stress if some more intense means of alerting people are used.

Where necessary, refuges (places of relative safety) should be provided for people who won't be able to evacuate independently and who will require assistance. These should be both separated from a fire/smoke by a fire-resisting construction and provided with a safe route to a final exit. If exposed to the elements, then shelter from inclement weather should be provided where people are expected to take refuge.

Where needed, such as refuges/muster points, Emergency Voice Communication points should be provided for the person waiting for assistance to speak directly with personnel in control of the evacuation.

Safety critical equipment such as evacuation lifts will be needed back up power supplies.

Appropriate structural, electrical and fire protection should be provided so that evacuation lifts are capable of being taken under control by a trained and authorized person.

Minimum escape distance and egress times for evacuation are key metrics for the fire strategy and inform the station planning and the location of fire fighter cores and escape routes.

Within busy, large or below-ground stations evacuation can be somewhat more complicated, where staff need to be capable of getting to an evacuation lift in a timely fashion and where lift sizing needs to cater for the anticipated demand within the time calculated before a situation becomes untenable. Alternatively, and subject to the appropriate safeguards and approvals, strategic operations rooms might be capable of operating lifts remotely sometime in the near future (once the necessary industry acceptance of such principles are agreed).

Refer also to Emergency evacuation, Operational considerations, Emergency communications, Staffing and training, Shelter and Lifts

NR Guidance Suite Reference

Fire Safety at stations
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5.7 Digital technology

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Image 5.9 Walking in a WiFi Zone

5.7.1 Who and why

As a national carrier we want to explore the benefits of digital technologies and how they could be applied to support accessible and equitable journeys for a broad range of people. We are particularly interested in how they could support wayfinding for people who are blind or partially sighted, or other people who may encounter challenges with wayfinding, for example some people with neurological conditions.

We believe that digital technology has the capacity and potential to support people's journeys:

→ As a wayfinding tool, for example to help people locate themselves through and within a station environment, and to guide people facilities such as station entrances, toilets, platforms and other key facilities.

→ As a means/mode of communicating information relevant to a journey.

→ To offer a more personalised passenger information, such as passengers being able to select audio information about step-free routes or being able to use a combination of more accessible audio and visual information.

→ As an aide that can support emergency evacuation.

→ As a means of offering greater personal safety/security

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5.7.2 Design considerations

Digital technology can be used to enhance user experience by accessing travel and locational information, principally in conjunction with smart phone technology. Various smartphone-based technologies are available that can support this. For example, visual information, provided on display screens, could also be made available in audible form where for people who are blind or partially sighted, or who benefit from audio information for other reasons. Digital technology can also be used to enhance the experience for children and help keep them entertained whilst traveling and whilst also learning through a variety of digitally enabled experiences.

However, a general principle to follow when exploring the use of digital technology is that it should never be looked upon as the only solution. For example, as well as providing information in digital form, it is just as important to consider the visual clarity and layout of a station, provide conventional information, provide in-situ or on-request staff assistance and to provide both audio and visual information on train departures etc, through Public Announcement and Visual Display systems.

It is recommended therefore that decision-makers who are responsible for evaluating digital technology should utilise assessment criteria and set out a process to guide the selection of digital technology options. Decision makers can then use these criteria to identify key workflow steps that explain the processes and actions that designers and other stakeholders need to take to assess digital technology options.

Considerations while assessing digital options:

Station operators and designers should undertake a cost benefit analysis of the systems available on the market before investing. Several factors will need to be considered to assess the suitability and feasibility of using emerging, or more well-established digital technology options.

It should be borne in mind that digital technology is very susceptible to change, and that people can become reliant on, or used to using a particular form of technology. Whilst change, and what is sometimes referred to as disruptive technology, can be a good thing, if that technology changes a lot or at too fast a pace, there is a risk that people can be excluded if they can no longer access technology they are used to using.

This is when digital technology can become so disruptive that it also becomes disabling. For example, this can occur if a person's digital device does not support an application revision, or if the design of the technological development is not as accessible for certain individuals as it once was or where use of new technology has to be 're-learnt'.

Imagine someone gaining access to a new walking aid only for someone to then come along and kick the walking aid out from underneath that person. One just wouldn't do such a crass thing and yet this can all to easily happen within in the digital world without appropriate safeguards and listening to users.

If technology is introduced it needs to be maintained, and if improvements occur, they should avoid leaving people, who use older technology, from being unsupported. Phasing of change and transitional support can then become very important. In some cases, those managing digital change and provision may need to maintain older technology for much longer periods than when first envisaged.

Whilst solutions for particular groups of individuals with specific needs are beneficial, applications that seek to include a broad demographic of user are likely to serve a wider group of people in total.

For example, users could include people who are blind or partially sighted, deaf or hard of hearing, who have mobility difficulties, who have neurological needs, who have need of refreshments, who have need of finding toilets quickly, who have differing language requirements and/or who may feel especially vulnerable to crime.

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5.7 Digital technology

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5.7.3 Digital Technology Selection

The list below includes example criteria that could be used to assess the suitability of digital options, including in relation to overarching and/ or specific accessibility requirements:

→ Preference should be given to technology that is free at the point of use and does not place people who would benefit from the technology at a financial disadvantage.

→ There is greater benefit to be had if the background and base technology is consistent and available across the rail network and that applications that use such technology strive for wide acceptance, consistency and lasting availability.

→ Applications that use data that is sourced from Network Rail and Train Operation Companies (TOCs) / Station Facilities Operators (SFOs) will rely on being maintained by providers of train services and if the provider of an application ceased to exist there is greater scope for replication of provision.

→ There are potential benefits to be considered at a local and regional level, however such local initiatives should sit alongside a national strategy that supports people whilst traveling from locality to locality.

→ Whilst allowing for innovation, preference should be given to using technology and applications that is capable of adoption by a wide range of people and with which Train Operating Companies and Station Facilities operators link/use rather than where different operators re-invent the wheel or where the operators are not able to interface with any prevailing technology.

Image 5.10 Passenger Planning App

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5.7 Digital technology

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5.7.4 Digital Technology Selection Criteria

→ Technology should be resistant to changes, with regular updates happening in real-time, to prevent outdated information being communicated.

→ Consideration should be given to how technology might be interacted with ergonomically and the challenges that some people may experience in term of holding devices up and moving devices in order to use cameras.

→ Functionality of digital applications could potentially offer support in the form of:

- Rail travel information,
- Local travel information or links to local travel information,
- Means of enabling users to explore station environment prior to arrival.
- Audio, visual, textual and haptic (touch/manipulation) prompts and controls.
- Compatibility with screen-reading functionality that describes what is on the screen of digital devices.
- Means of magnifying imagery and displaying braille.
- Means of utilising blue tooth enabled devices such as body cameras or wheelchair mounted cameras.
- Means of providing user customisation, such as with regard to prompts and controls.
- Uses maps and directories and ideally augmented reality technology.

- Means of identifying desired destination in station and then directions to desired destination.
- Means of obtaining and connecting with staff who can provide assistance,
- Guidance and advice on the means of arriving, accessing, departing and leaving stations,
- Means of supporting complete inward and outward "last mile" journeys beyond the station.
- Navigational support within stations to and from point of arrival,
- Information on the facilities available at a station and where these might be found,
- Information as to the degree of step-free provision that is available or not,
- Information on the current auditory, visual and lighting characteristics of a station,
- Information about emergency egress procedures,
- Support during emergency egress,
- Means of calling for help if someone feels that their personal safety/security is threatened,
- Means of texting or speaking to someone if one is feeling suicidal.

→ There should be a high probability of the technology being sustained for a long period of time.

→ Technology should be scalable and be capable of being used and at stations of all types and scale.

→ There should ideally be a likelihood of wider application for this technology for use in environments other than stations and thereby increase scope for its adoption and familiarity with the population.

→ Whilst there are many interesting digital innovations, the benefits that digital options offer for specific personas and scenarios should be well-researched and understood, as should any drawback or potential risks.

→ Whilst selecting digital technology, it is essential to be mindful of the risks and potential impact of digital exclusion for people for whom digital technology is not accessible, such as some older people, some people with sensory neurological conditions, people who read using symbols rather than text or people who don't have access to a suitable device.

→ Good mobile data access is essential and should be accompanied by an option for easily accessed Wi-Fi.

→ There should be means of charging one's phone/device at stations in conjunction with the rising use of digital technology.

→ Account should be taken of differing digital, visual, auditory, linguistic needs and a variety of accessible formats and/or modes of communication.

→ Whatever is being considered should be easy to use and predictable.

→ Features and functions should include reliable data and signals.

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5.7   Digital technology

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→ Information and data feeds need to be maintained and kept up to date.

→ There should be avoidance of interference from electromagnetic sources, such as overhead power cables.

→ Information accompanying the technology should be easily understood and available in accessible formats.

→ Technology should take account of people of all ages and their personal safety / security and safeguarding. Examples of potential risks include people hacking QR codes by switching them with QR codes that connect to malicious websites, or people getting distracted or mugged whilst using a personal device such as a phone.

→ Preference should be given to solutions that do not rely on adding physical features or hardware (such as code or beacon systems) to stations that could otherwise be tampered with, require maintenance or updating or present a problem in a heritage context.

→ All proposed technology should be expertly assessed in terms of cyber security and safety.

→ Account should be taken of specific operational considerations pertaining to specific station environments that relate to people's equitable and safe use of the station environment.

User group consultation will be key for selecting and applying digital technology options, including for different station sizes and types. User group consultation could also be utilised in order to further develop assessment criterion for digital technology selection, as listed above. The Network Rail Built Environment Access Panel (BEAP) should be consulted and a Diversity Impact Assessment should be undertaken.

There is the potential to use local partnership working to address some potential digital exclusion, for example via information and assistance offered within mobility hub facilities near or at rail stations, or via other partnership arrangements. Mobility hubs might also be the location at which mobile data, Wi-Fi, device charging, visual and auditory information are also made available.

It will be important to undertake engagement, consultation, testing, and monitoring and review, with people with specialist accessibility knowledge, people with lived experiences (including hidden disabilities) and people of different ages.

Attention should also be paid to how digital technology could support personal safety, including the safety of disabled people, women and girls and other groups for whom personal safety concerns or risks are more prominent. It may also be beneficial to explore which products, services, and ways of using digital technology are most beneficial to these groups, and how this may enhance all people's experiences of personal safety.

Review and monitoring are important for understanding if the introduction of a digital technology is meeting the desired outcomes in relation to accessibility. It is important to build in these processes from an early stage, whilst factoring in how digital technology and available products might evolve and change.

Image 5.11
Police dog and children

Case Studies
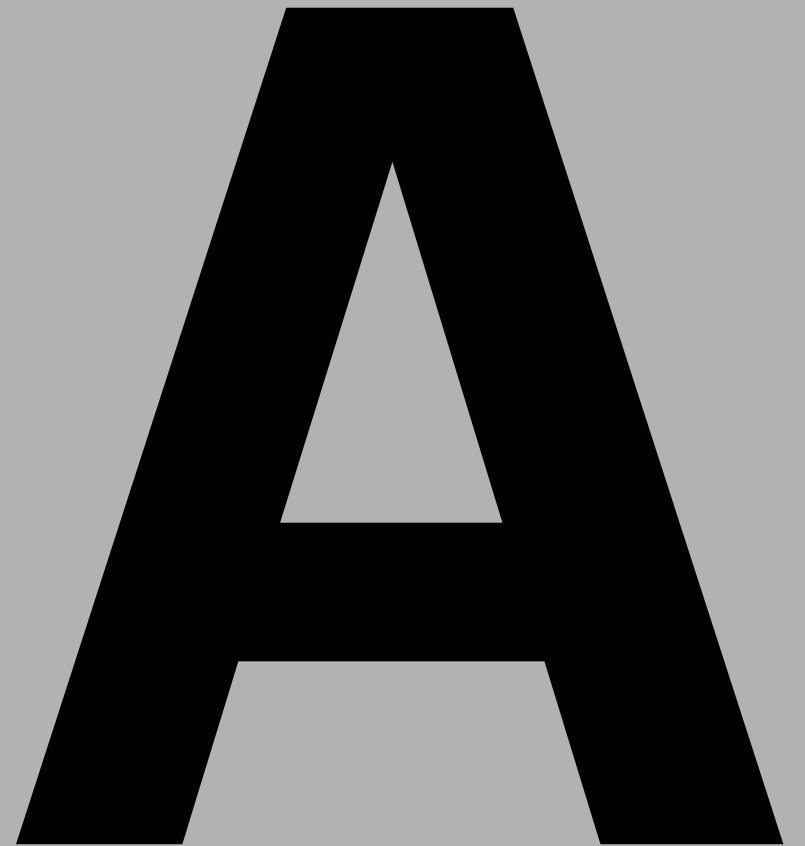
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Appendix A
Case Studies

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Barking Riverside Station – Circulation

Barking Riverside Station is a new London Overground station in East London. It is an extension of an existing rail line and connects passengers to two underground lines. The new station will be step-free and will connect to a newly designed public square.

The station has step-free access to all platforms, spacious and clutter-free circulation routes, and other design elements that support ease of circulation. Various design elements that support equitable and accessible circulation are shown in the images above/below. Lifts and steps are close to each other, and the lifts in the image are visible from the passenger approach to the steps. This will help people to easily identify, reach and use the vertical circulation option that is most accessible for them. The layout and materials in the images show how a generally open aspect has been achieved in the design. The lift waiting areas near the top of the stairs are out of the main circulation routes but still visible from them; this visibility across circulation routes is likely to support people's feelings and experience of personal safety when using the station, and lifts and stairs.

Good visual and tonal contrast is shown on stair and other handrails, which supports people to use handrails and stairs easily, and identify the outer edges of circulation routes where the orange rails are present. The station building has also been designed to reduce the chance of wind tunnels, which is a positive in terms of thermal, and general comfort for staff and passengers.

Image 2 Barking Riverside Station Platform

Image 1 Barking Riverside Station lifts, stairs, and main circulation routes

Image 3 Barking Riverside Station Entrance

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Kings Cross Family Lounge

The Family Lounge at Kings Cross station was created by a group of train operators. It is located on the main concourse next to the Travel Centre, is open during travel centre opening hours and is for children accompanied by an adult. The lounge provides a range of seating, a play train structure with built in slide, table-top games, penny press, soft play area, train set, rail heritage wall and video screens showing rail-themed footage. It also provides a breast-feeding area.

The lounge helps provide a more equitable journey experience by enhancing and easing family journeys. It offers a range of benefits for children with disabilities. The images above/below show how a rail theme is used, which many children will be able to understand and engage with, including tourists. The dedicated lounge space and its range of features offers distraction for children who may struggle with the scale and sensory experience in some station environments, for example some neurodivergent or younger children. Having a choice of features and spaces may enable many neurodivergent children to seek out the features and spaces that are most enjoyable, interesting, or calming for them, and offers the chance to play with others or alone, which some children prefer. The model train set has space underneath and the option to view it from different heights.

Potential drawbacks in the images shown above/below are an apparent lack of wheelchair and pram circulation space in some areas, and patterned flooring, which can cause people issues with coordination and walking. The patterning could be placed away from the bottom of a slide, such as on the edge of the room.

On stations where it's not possible to provide such a large and dedicated family space, the principles, features and benefits highlighted in this case study could be drawn on to inspire playful features in smaller sized stations, for example in waiting rooms on station concourses, or in ticket offices and halls.

Image 2 A range of seating, screens and wall art

Image 1 Model railway in Kings Cross Family Room

Image 3 Play features, colourful flooring, and model railway with space underneath

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Quiet spaces - HS2 Technical Specification and other quiet space examples

Quiet spaces are rooms or areas that offer people the chance to use spaces that have auditory and visual calm and quiet and sometimes privacy, for resting, contemplation or prayer.

HS2 Ltd conducted research to explore how quiet spaces could be best designed in a consistent way across its infrastructure, for people from religious and non-religious backgrounds, and for people with different neurological needs. Some key outputs from this research are helpful for understanding an overall preferred design approach, key design requirement, and what the most appropriate provision is for different station sizes. Requirements include provision for staff and customers, and the proximity of quiet spaces to other services such as toilets. There is also the need to balance room sizes against the overall available space in the building, and predicted occupancy and user requirements. Key rules that were generated for all room sizes include the provision of:

· More than one room
· A bookable room
· A designated area for shoe removal if desired
· Accessible washing facilities
· A wheelchair accessible WC nearby

The two diagrams above/below show example layouts for quiet space provision for staff and customers, and associated entrance lobbies. The other photos above/below show how quiet and inclusive spaces have been provided in a waiting room area. Crewe Station's 'Calm Corner' and waiting area incorporates calm décor and lighting, and greenery and biophilic design which provides a range of cognitive, sensory and health benefits for people. The room also includes a totem screen with journey information, a children's play table, and a 'memory corner' to support people living with dementia. It is recognised that the HS2 recommendations apply most at very large stations. The principles however can be deployed at small and medium stations too.

Image 2 A new standard for health and well-being: HS2 quiet spaces technical specification': Indicative layout plan for a staff quiet room facility

Image 1 A new standard for health and well-being: HS2 quiet spaces technical specification': Indicative layout plan for a customer quiet room facility

Image 3 Crewe Rail Station waiting room designed for people with hidden disabilities

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Bat and Ball Station

Bat and Ball Station is on the Thameslink line that runs to London. The old station building was restored and refurbished after Sevenoaks Town Council was given the building on a 25 year lease for an affordable rent. The old station building station houses community rooms that can be used for events, a community café, and internal, external and accessible WCs.

A 'Friends of' the station group supports and promotes the station and venue, and has other aims such as supporting regeneration in the area, encouraging interaction with local community and businesses, and providing information to the public. The group hosts activities such as gardening opportunities. Community use of the buildings includes heritage events and activities such as volunteers hosting social events for people living with memory loss and dementia, and their partners and carers.

Image 1 Community rooms at Bat and Ball station

Image 2 Community café at Bat and Ball station

Image 3 Gardening volunteers

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Digital Technology

Technology name / type	Purpose and who the technology is aimed at	How the technology works	Other considerations
Passenger Assist Mobile phone application and web-based service	Disabled people and people with other accessibility needs.	The app lets people create a profile outlining their accessibility needs. People can request assistance for their rail journey, manage their assistance needs, view travel history and browse rail journeys via an online journey planner. Wheelchair spaces on trains automatically booked by staff once an app user has added 'wheelchair user' to their profile. There is also a web version of the app.	Ongoing success will depend on the quality of information and maintenance of the app and web-based service.
GoodMaps Mobile phone application	A navigation tool designed for a broad range of people including people who are blind or partially sighted, deaf or hard of hearing, mobility impaired, neurodiverse, and people who do not read English. The app provides user customisations via a visual digital map, augmented reality, directory, and audio/haptic/textual prompts. It can allow users to virtually explore station environment layouts, and plan and 'trial' their journey through a station prior to arrival.	Users hold up their smartphone for initial localization, then the app provides visual or spoken turn-by-turn directions. The person can also follow the visual map from their location to specific destinations such as ticket office or platforms. The app can be used with the VoiceOver/TalkBack on iOS and Android. It is also compatible with magnification/zoom and braille displays. The app utilises computer vision and camera-based positioning to provide meter level accuracy for the user. The building owner receives access to GoodMaps Studio to update/edit their map and points of interest in real-time to keep information up to date.	The app needs the camera initially, so it can identify the user location in real time, and to function well. This may present limitations for people who cannot hold/manipulate a phone whilst moving around, such as people using mobility aids.

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Technology name / type	Purpose and who the technology is aimed at	How the technology works	Other considerations
NaviLens (trialled at Euston Station) Mobile phone application	Mainly developed with blind and partially sighted people in mind but it has potential benefits for other people. After scanning strategically placed codes, the app can talk users through the steps on their journey by providing distance and guidance information.	After users scan carefully placed and easy-to-identify visual codes (similar to QR codes), their phone gives them visual/audio information that matches the coded information from the sign/object they have just scanned. Codes can be scanned from distances and at different angles. Codes can share static and dynamic information e.g., signage, points of interest within a space, and real time travel information.	The app needs the camera on so it can identify the user location in real time, and to function well. This may present limitations for people who cannot hold/manipulate a phone whilst moving around, such as people using mobility aids. Whilst the codes are reportedly designed to avoid hacking, there could be potential risks of similar-looking QR codes being used for other purposes such as hacking/fraud. NaviLens and similar technology would need to be subject a cyber security review.
Augmented Reality functions for pre-planning purposes	Useful for people with neurodivergent conditions. Can assist passengers who may feel nervous about travelling, including first-time visitors and individuals with mobility issues.	As mentioned above on this table, Augmented Reality (AR) maps can be made of stations. Ahead of visits, interactive virtual tours can help people pre-plan their visit to stations, and familiarise with station layouts and facilities. Maps can enable users to locate important areas within stations such as customer information screens, lifts, toilets, and help points. Building Owners can modify maps in real time to keep information up to date.	Ongoing success will depend on the quality of information and maintenance of the service.

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Technology name / type	Purpose and who the technology is aimed at	How the technology works	Other considerations
ADi RoomMate®	To help people who are blind and partially sighted people to use a toilet, by means of an audio description of the toilet compartment.	The RoomMate® is an electronic, wall-mounted device. When a person enters the toilet, an audio announcement states that a recorded description of the cubicle is available. The person can then activate the recording by passing their hand in front of a unit. If features within the toilet are altered at any time in the future, new instructions can be entered on-site.	Unless augmented with additional functionality is provided, there could be language barriers and potential confusion for people with hearing impairments, and/or who don't speak the language of the audio recording.
Audio Description - such as used at Bristol Temple Meads Station	To help people blind and partially sighted people with journey planning.	Uses pre-recorded descriptive audio files of the station; particularly developed to take support people's use of the station due to impact caused by layout changes, caused by works to the station roof.	Although potentially useful during the pre-planning stages of a project, this initiative appears to be more reliant on people remembering what they have heard and navigating themselves around a web file environment to find the information they need.

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Image 1 Adi RoomMate placed on wall outside toilet compartment

Image 2 NaviLens 'Way Out' sign at Euston Station
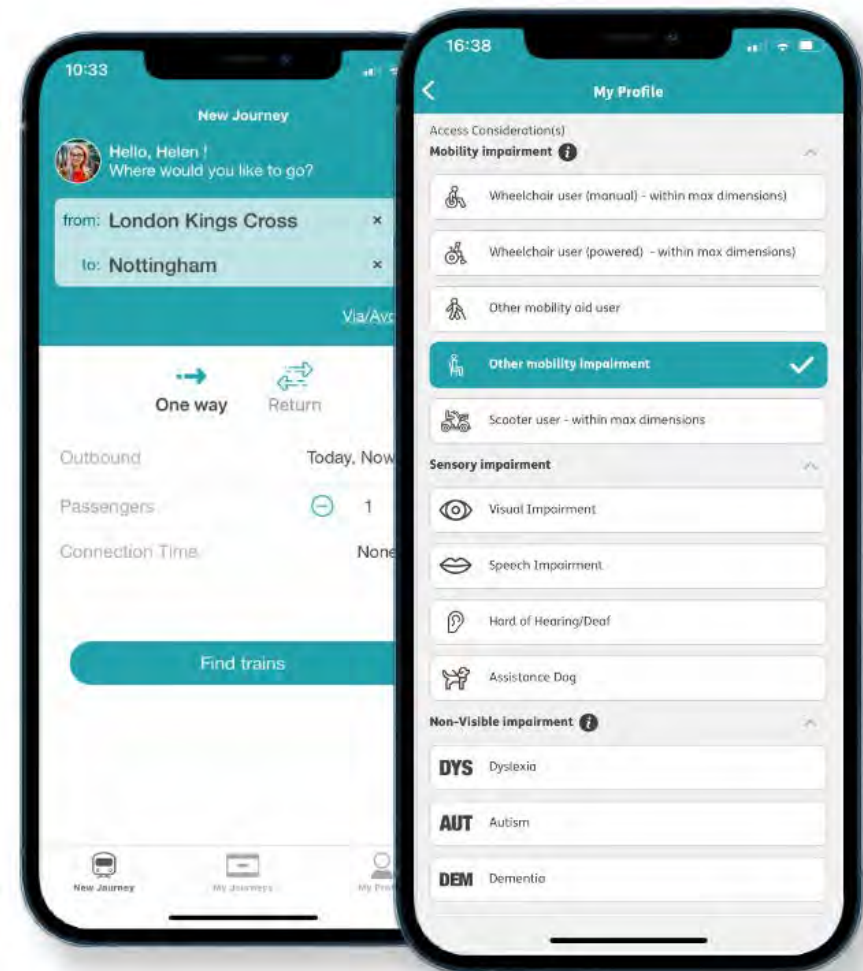
Image 3 Passenger Assist mobile phone app

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Image 4 Augmented reality wayfinding aide

Image 5 Braille lift controls

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Definitions

Appendix B
Definitions

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AR	Augmented Reality
ATM	Automatic Transaction Machine
BEAP	Built Environment Access Panel
BS	British Standards
CCTV	Closed-circuit Television
CIBSE	Chartered Institution of Building Services Engineers
CIS	Customer Information Screens
CP	Changing Places
DfT	Department for Transport
DIA	Diversity Impact Assessment
ESA	Environment & Social Minimum Requirements
LRV	Light Reflectance Value
NR	Network Rail
PA	Public Address
TfL	Transport For London
TOC	Train Operating Companies
VA	Voice Alarm
WC	Water Closet

Appendix C
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Image:

Front Image © Network Rail
Back Image © Network Rail

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Image A.C1
Young passenger on platform

Reference Documents

Appendix D
Reference Documents

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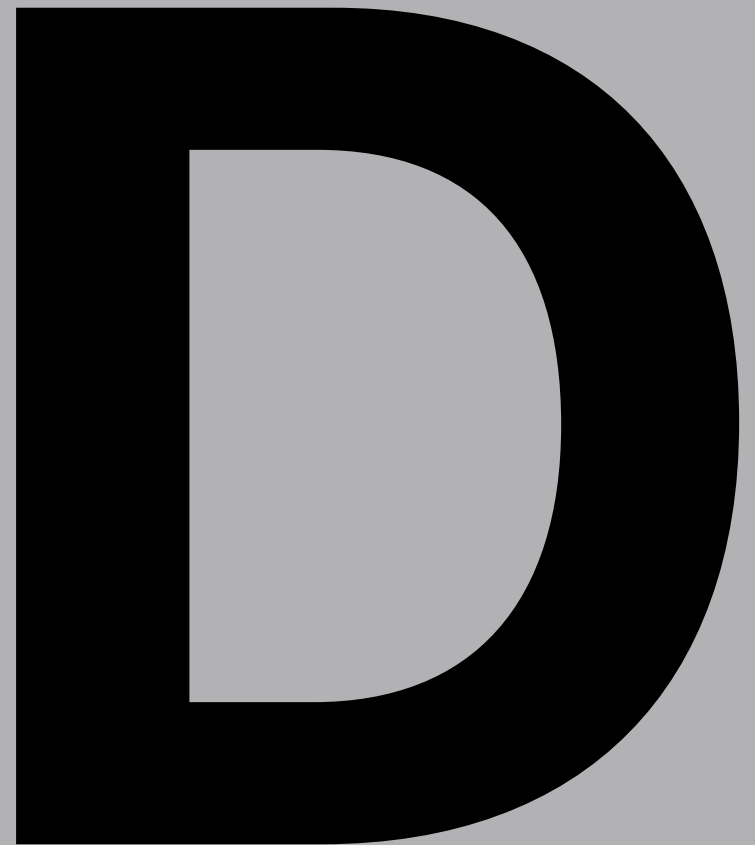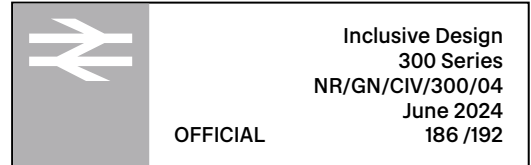
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NR/GN/CIV/100/04 Climate Action Design

NR/GN/CIV/100/05 Heritage: Care & Development

NR/GN/CIV/100/07 Masterplanning at Stations

NR/GN/CIV/100/08 Investment in Stations

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NR/GN/CIV/200/11 Parking and Mobility

NR/GN/CIV/200/13 Electrical Vehicle Charging
Points and Associated Infrastructure

NR/GN/CIV/300/01 Wayfinding

NR/GN/CIV/300/02 Security at Stations

NR/GN/CIV/300/03 Fire Safety at Stations

NR/GN/CIV/300/04 Inclusive Design

NR/GN/CIV/300/05 Rail Symbol 2

NR/GN/CIV/300/06 Tactile Paving and Wayfinding

NR/GN/CIV/300/07 Diversity Impact Assessment

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Carbon Plant Room Guide

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NR/L2/CIV/193 Standard specification
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NR/L3/CIV/194 Selection and design
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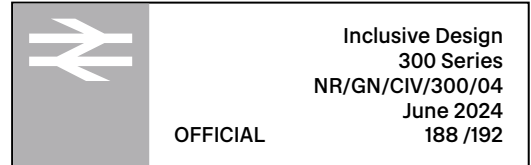
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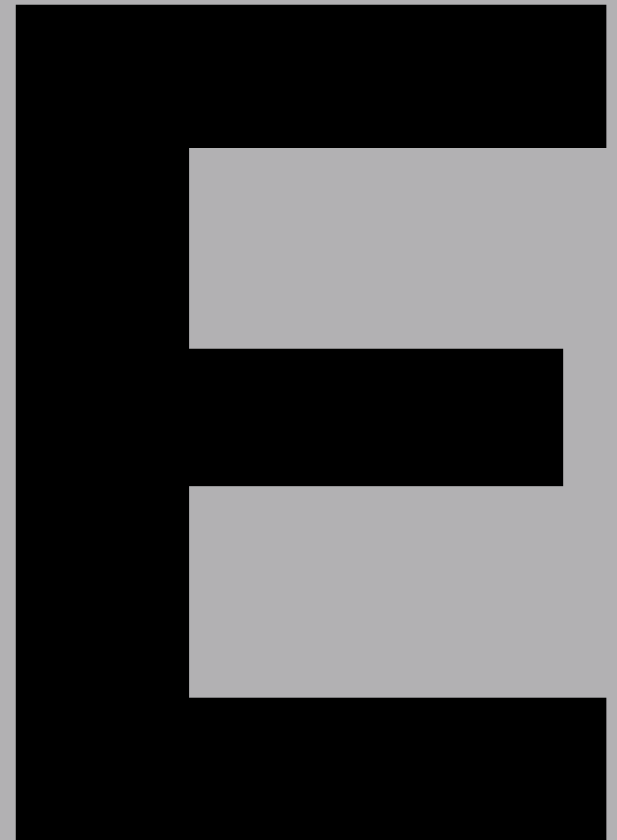TfL Workplace Cycle Parking Guide, 2006

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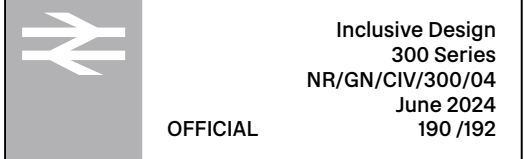UCL Accessibility Research Group - Effective Kerb Heights for Blind and Partially Sighted People, 2009

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