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PLACES AND SPACES WITH EVERYONE IN MIND

Designing for Neurodiversity and Mental Health

A white paper from WSP

Though there is still much work to do, physical access principles are more embedded in design when compared with how we design for the mind. We want to change this.

We asked ourselves, what can we do to build on this momentum and help to drive the change required? We have a unique opportunity to influence the built environment, stimulate discussion at a policy level, and work with our clients to develop designs without barriers.

It's estimated that about 15% of people in the UK are neurodivergent. Additionally, the growth of reported impacts related to mental health is a key trend we're tracking as part of our global Future Ready™ programme, and year on year this has been rising in the UK.

Neurodivergent people may be more susceptible to poor mental health as a secondary impact of the barriers they experience in the world. This could relate to a lack of support and diagnosis, or the pressure to act neurotypically in order to avoid negativity.

The development of the **first building design standard for sensory and neurological needs** marks a significant turning point. This paper seeks to highlight how important it is to consider the mind – and more specifically, everyone's minds – when designing places and spaces.

In preparing this paper, we spoke to people who consider themselves neurodiverse to better understand their experiences and the barriers they face. We sought to find out what they find easy and what they find hard, and used these findings to produce some simple principles for design teams across the built environment. And we've highlighted a range of examples which work well for all.

UK people reporting mental health disabilities to the annual NHS Family Resource Survey have more than doubled since 2012.

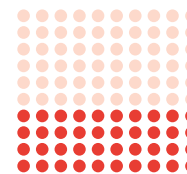2012 2013 2014 2015 2016 2017 2018 2019 2020
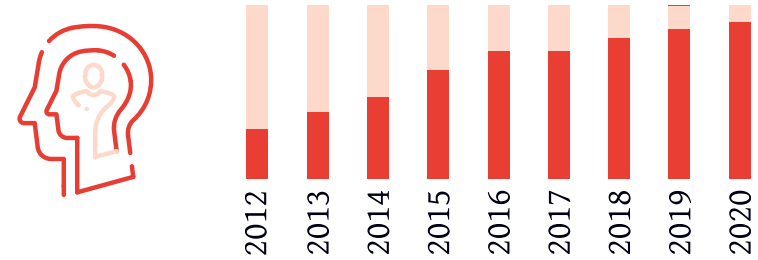
96% of illnesses are non-visible.
(Wall, C 2020)

1 in 5 of the population are neurodiverse.
(ADHD Foundation, 2021)

There are currently around 85,000 people with dementia in the UK, which is projected to rise to 1.6 million by 2040.
(Alzheimer's Society, 2021)

What do we mean by neurodiversity?

There is no standard definition for neurodiversity, it should be considered an umbrella term and a way to understand how we all experience and interact with the world differently.

This paper discusses neurodiversity in its broadest sense including, but not limited to; autism, ADHD, dyslexia, depression, anxiety disorders, and dementia. We have deliberately avoided recommending any particular intervention in relation to any specific condition or symptom, in recognition of the uniqueness of experience.

As set out in the newly published building design standard, terminology related to neurodiversity has been developed by grouping profiles as either neurotypical, neurodivergent, or neurodegenerative. The reality is that boundaries and language differ, are very personal, and can be hard to define.

For some people a formal diagnosis is an important way to recognise and name their experiences and, access the support they need. But many people may not have, or ever have, any formal assessment, and might not fit into a clearly defined group.

If we take a more holistic view of neurodiversity, which does include depression, then we're no longer considering a percentage of the population, we could be considering everyone at some point in their lives.

We believe that to build equitable, resilient, sustainable, and Future Ready™ places we should view neurodiversity as a spectrum on which everyone exists and recognise that our position on this spectrum will vary at different times in our lives.

"Neurodiversity is the term used to describe the variation in neurocognitive profiles across the whole population...it is not about one condition, difficulty or difference. The term recognizes the variety in the way we speak, think, move, act and communicate; that human brains are diverse and vary."

British Standards Institute, Design for the mind - Neurodiversity and the built environment

The principles and interventions on a page

Our research really brought to life the complex, and often conflicting design requirements for shared spaces. Features that may benefit some, could have the opposite effect on others. While recognising that it's difficult, one of the key principles of our WSP Future Ready approach is to get beyond 'it's difficult' and to try to provide practical guidance for all. This page sets out on a page a high level process and key themes which can help make places more accessible for all - and which help mental health.

Design Process

Discuss

Relevant, representative, and timely stakeholder engagement

Design

Early intervention on projects with a focus on "create, iterate, create"

Deliver

Refine design, address sticking points and learn lessons

Choice and agency

- Give users a variety of options that consider different physical and sensory experiences, with options that are more or less stimulating.
  - A variety of routes
  - A choice of places to sit, to work, to meet, to relax in offices
  - The option to choose decor at home.

1. Quiet

- Clearly identifiable quiet zones in busy areas
- Sound-absorbing materials and insulation
- Consider sensory pods and specialist features / software.

2. Nature

- Planting, wildlife, and water
- Natural form and elements; stone, wood, and textiles
- Natural light supported by indirect, consistent, dimmable lights
- Matte, neutral, consistent finishes.

3. Intuitive

- Logical design, using zones to support easy, clear wayfinding
- Simple and consistent symbols and pictures for signs and design features
- Information delivered in more than one way and available to use for planning (ahead of a journey or experience)
- Don't assume social rules or expectations are obvious; be explicit about social rules and keep them simple

4. Accessible

- One way traffic and pedestrian flows, separation between people and vehicles
- Shorter distances to walk and regular places to sit down in a variety of styles (ordered, not ordered)
- Uncluttered, wider walkways with few level changes
- Enable and encourage people to use their preferred method of communication
- Matte, neutral, consistent.

5. Safe

- Designing out catastrophic impulsive risks
- Safety features, like CCTV and lighting
- Installing refuge areas and the means to access help or support

We've used four different personas to explain different experiences

These personas are based on interviews and research. They represent a cross section of experiences and barriers that people can face when navigating the built environment. Our personas aim to bring these experiences to life and explore potentially beneficial changes in design. We recognise that these experiences may not reflect everyone's experience – rather, they intend to highlight commonalities in experience.

Persona 1 - Alex

Alex (she/her)

Alex is 25 years old and is on the Autism spectrum. She lives with her parents and works at a local office in town. Alex loves socialising with friends and being out and about exploring the world.
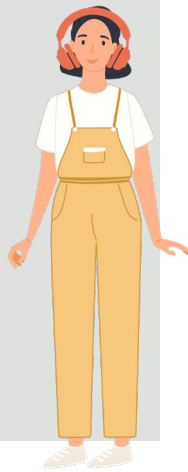
> *I'm often playing catch-up with my brain*

> *I don't like sudden transitions in light and sound*

Alex is friendly, curious and comfortable travelling by herself, but she can also become easily distracted when out and about. She likes to know the plan for the day ahead and will often look to others for reassurance – especially during stressful or unexpected situations. Experiencing sensory overload, feeling overwhelmed and anxious are quite common feelings for Alex when travelling. She will often manage these feelings by using things such as noise cancelling headphones, or by memorising routes before she leaves the house.

What common barriers may Alex experience?

- Bright, neon or altering patterns in lights.
- Signage and instructions with lots of writing but no images.
- Clashing or irregular patterns in flooring or decoration.
- Potential hazards, like oncoming traffic, may be overlooked if she feels overwhelmed or experiencing sensory overload.

What design features may help Alex?

- Matte finishes on paints and surfaces that do not reflect light.
- Natural light and neutral-toned, indirect and dimmable lights.
- Gradual transitional changes between areas of light and dark.
- Wide, open and uncluttered spaces.
- Intuitive wayfinding that guide to entrances, exits and through spaces easily.
- Clearly identifiable quiet zones.
- Sound-absorbing materials and a focus on sound-insulation between different areas.
- Symbols and pictures to explain what a design feature is and how it's used.

We've used four different personas to explain different experiences

Persona 2 - Jacob & David

Jacob (he/him) & David (he/him)

Jacob, 17, has Down's Syndrome and is assisted by his carer, David. When out and about, Jacob is accompanied by David who will navigate, but they like to make as many of their decisions together as possible as Jacob is learning to travel independently. Jacob has a supported internship working 3 days a week via a Workfit scheme.

> *Having a human presence will always be helpful*

> *If Jacob becomes stressed and overwhelmed when we're out and about, sometimes i do too*

Jacob experiences several sensory challenges, which impacts how he interacts with his environment. For example, sometimes objects can be difficult to use, or sounds can either appear muffled or overly loud. Jacob tends to respond better to visual forms of communication, rather than verbal or written, as images tend to be easier to recall and form into memorable patterns. Jacob can sometimes feel stressed, agitated and upset in situation or environments where he feels out of control or hasn't been before. Travelling with David is really important to Jacob, as he is able to assist him in becoming a confident, independent traveller. This is being made a lot easier by mobile technology and apps, where Jacob is supported in developing navigational and decision-making skills.

What common barriers may Jacob & David experience?

- Jacob struggles with depth perception using stairs or following narrow pathways - especially if there's large crowds travelling in different directions.
- David likes to teach Jacob how to use public transport while they are out. This can be difficult if maps are hard to read, or information is text-heavy.
- Finding space for Jacob and David to sit together on the train and bus.
- Jacob may find it hard to work out himself how long a journey may take or deal with unexpected events by himself.

What design features and attributes may help Jacob and David?

- Wider walkways or sections of pathways without changes in levels.
- Clearly marked directions from a way out.
- Open, quiet areas full of greenery and seating.
- Transport information delivered in more than way.
- Simple, colourful and consistent symbols or pictures for directions.
- One-way systems to reduce impact of crowds.

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We've used four different personas to explain different experiences

Persona 3 - Carole

Carole (she/her)

Carole, 72, was diagnosed with dementia two years ago. Carole is active, enjoys her independence and attends weekly art classes at her local community centre. She currently lives with family, but as her condition is still in the fairly early stages and is sometimes asymptomatic, many people often do not realise she has dementia.

> " *Don't just assume a design will speak for itself - offer clear instructions and pictorial guidance* "

Carole can experience frequent and sudden changes in short term memory, often when she is out and about. She sometimes feels nervous about making mistakes, or appearing incapable to others, so will often seek out places, objects and people that are familiar to make her feel safe again in times of feeling insecure, confused or disorientated. Carole is also likely to do things herself and maintain as much independence as possible, so may become stubborn at times.

What common barriers may Carole experience?

- May become confused or embarrassed if she forgets where she is, where she is going or why she is there.
- She finds signs, information boards, descriptions and directions increasingly difficult to read.
- Often finds pushing buttons difficult, especially if she is not quite sure what they are for.
- Change in floor texture, colour or feel may cause her to become disorientated.
- No staff available or trained in order to provide support and guidance.
- New technology or design features that are unfamiliar.

What design features and attributes may help Carole?

- Natural features like plants and water, together with regular seating.
- Intuitive way finding such as lighting, trees or paths.
- Simple, colourful and consistent symbols or pictures for directions.
- Use of the same colours for the same parts of an interior to enhance depth perception.
- Designated shopping hours, assistive services or staff training.
- Shorter distances to walk.

We've used four different personas to explain different experiences

Persona 4 - Charlie – generalised anxiety disorder

Charlie (they/them)

Charlie, 30, has mixed anxiety and depressive disorder; experiencing symptoms of both conditions that vary in intensity. They have a fast-paced, high-stress job, and commute into the city daily for work.

> " *Unwritten rules are really hard to negotiate* "

Charlie will often ruminate on past experiences that caused them difficulty or anxiety. They often find their concentration drifting away and will feel like they're in a constant daze, which sometimes makes it hard to make a decision on the spot. Feeling physical symptoms of their condition when out and about, such as nausea and dizziness, is quite common. They'll often become intensely anxious before a journey and will plan ahead down to the detail and will consider the ways in which things could go wrong. Charlie may become forgetful, disorientated and anxious when faced with unexpected situations, lots of clashing sounds or lights or when in big crowds.

What common barriers may Charlie experience?

- Being overwhelmed with either an abundance or lack of available information and options.
- Feels anxious when parking their car, especially in a busy area.
- Overcrowded places, or areas where groups of people gather without a clear flow of movement.
- Loud noises, and environments with different overlapping and clashing noises.
- Environments where they feel claustrophobic and cannot see a clear exit or route away from crowds.
- Likely to completely avoid using a given transport service if they feel stressed, rushed, disorientated or anxious as a result of using it.

What design features and attributes may help Charlie?

- Maps that show floor and route layouts of places, available in central, easy to access locations and online.
- Online or simple ticket sales such as tap in and out.
- Real time service information.
- Calm, quiet spaces.
- Natural features like plants and water.
- Visible safety features – like lighting and CCTV.
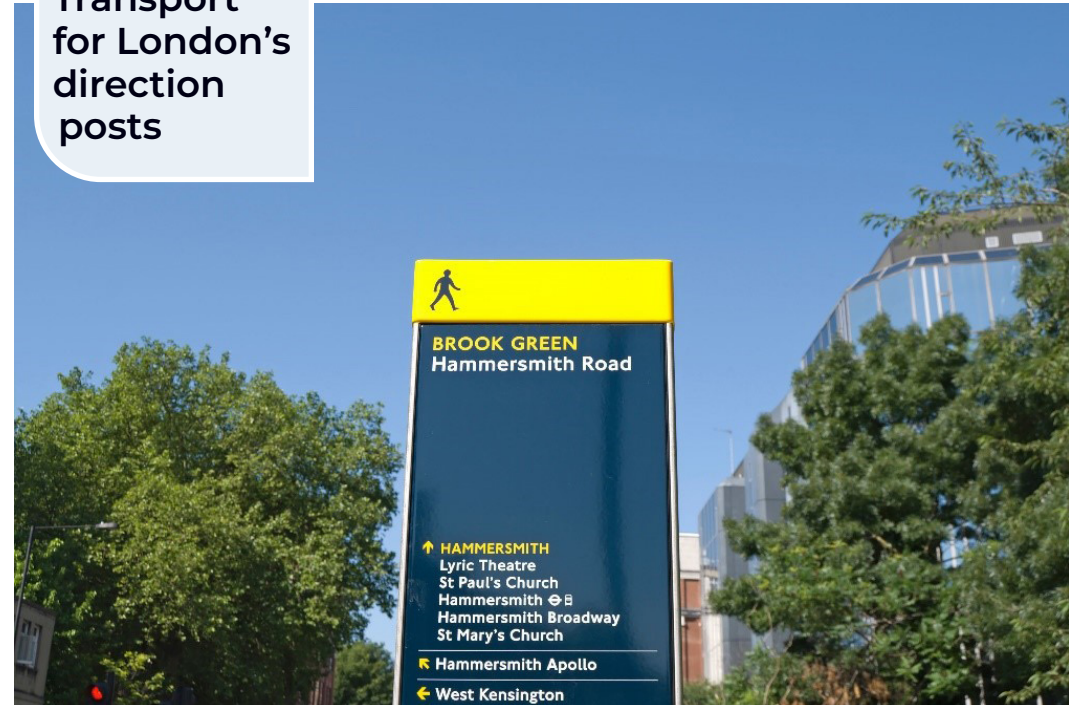
The spaces and features we like

There's few places designed specifically with neurodiversity in mind, but here's a selection of places that we've found in our research which could make life easier for all.

Birmingham New Street Station

An oasis of calm in a busy environment – natural light, neutral finishes, a quiet space. Less clear for wayfinding, but it's the calmest railways station we visit.

Transport for London's direction posts

Simple, clear consistent signs that give regular, easy directions. Useful for everyone!

The spaces and features we like

Coventry station

Upgrading an existing 1960's railway station to be calmer, more open and easier to access.

- Avoiding overcrowding through greater capacity
- Adding in seating at different heights through the station. Adding shading to the glass on the main platform bridge to help people who suffer from vertigo.
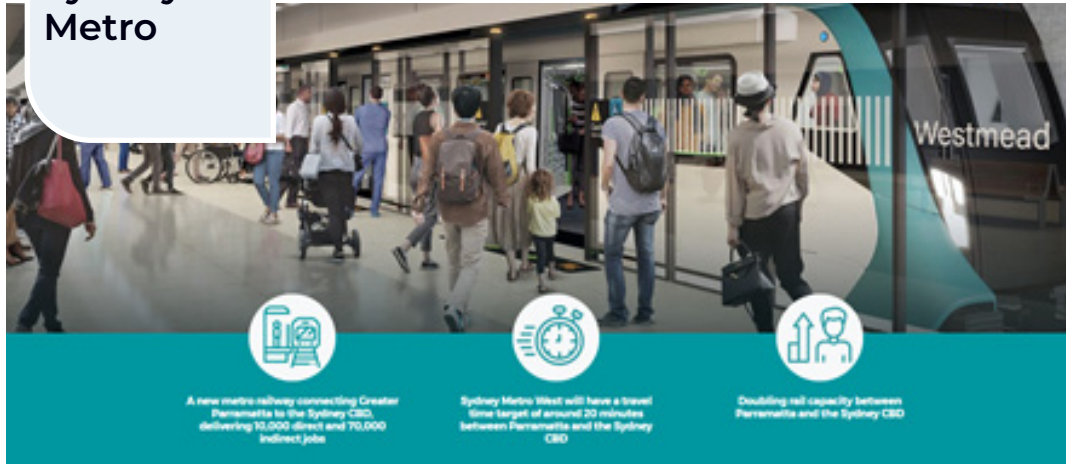
Museum of London's Sensory map
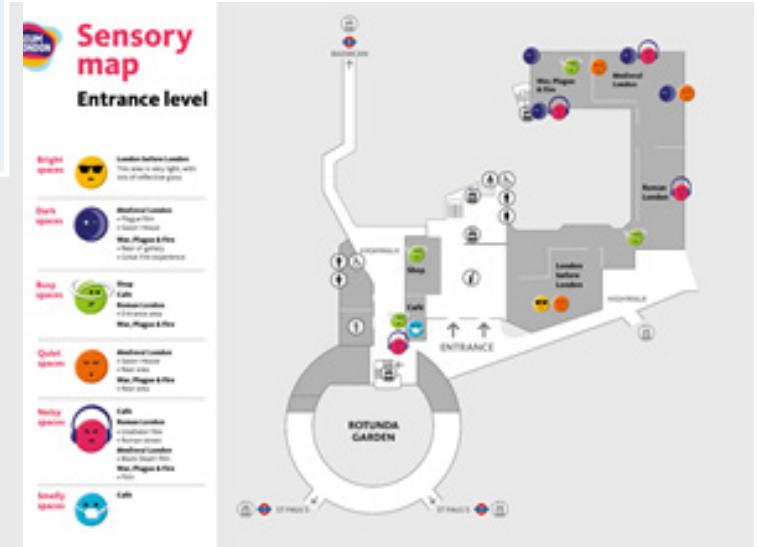
The Museum of London's website has a comprehensive summary of what to expect for all visitors' needs.

We especially like the sensory map that allows customers or parents of children with sensory needs to prepare for any likely experiences of locations that might cause distress.

The spaces and features we like

Sydney Metro

A new metro line connecting Greater Paramata to the Sydney CBD, with WSP as a key design partner.

- Our WSP team tested the intuitive nature of the design by asking customers to navigate through a Virtual model in different circumstances. With no signage to test the intuitive nature of the design. To ask customers how they were feeling as they navigated through the model to help the design team design out complexity.
- Natural light used to help alleviate anxiety on long escalator runs and feelings of claustrophobia underground. Long, open sight lines used together with open platforms.
- Especial focus on the entry / exit to stations as our focus groups showed that these were key 'moments' for the journey both as they entered the metro and also travel onwards to their destination.

New River College, Islington, London

New River College was designed for pupils not able to attend mainstream schools.

- The school is a light, airy design which makes the most of natural light and ventilation.
- It uses natural finishes with plenty of greenery to provide a natural space.
- WSP, as the acoustics consultant, designed the space to be quiet – using sound adsorbent materials throughout, designing the walls and ventilation system to cut down noise from different parts of the building and carefully modelling likely sound levels throughout the design.

As the Head Teacher says "The auditory environment for these guys is critical. We don't notice any noise from outside. "These rooms are used for lots of different functions as well as for calming and quiet spaces. It works really well."

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The spaces and features we like

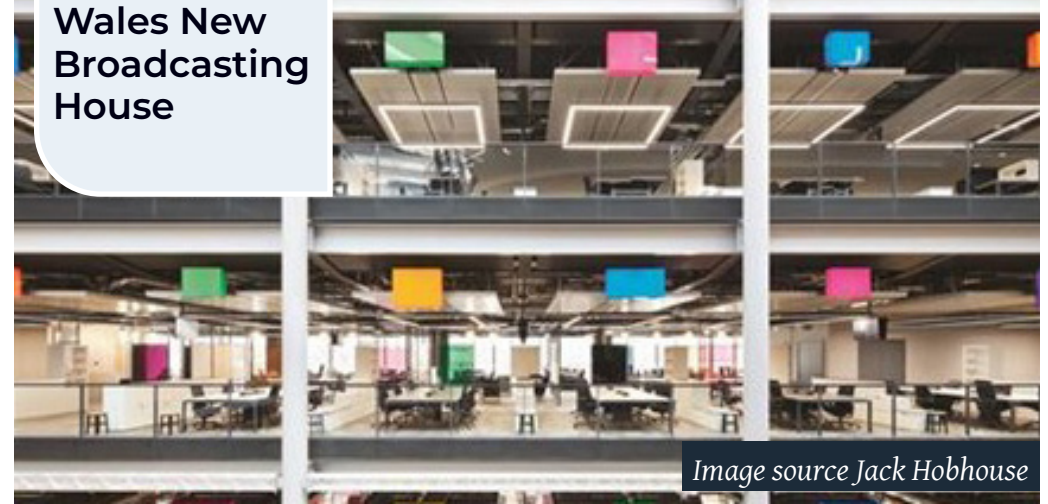## Village Landais Henri Emmanuelli, France

Village Landais is a community designed for people with dementia. It has 120 residents.

- Designed as a place for living rather than a medical institution.
- Extensive access to green space and nature.
- Natural lighting throughout.
- Simple design and layout.
- Designed and operated to be a part of the community of Dax, the town- free for all to come and go.
- Accessible, recognising that it's often older people who have dementia.

Read more at [village Alzheimer](#)

Image source Jack Hobhouse

BBC Cymru Wales New Broadcasting House

BBC's new Wales HQ is regardeda s a showcase building for neurodiversity. Key elements included are:

- Use of virtual reality through the design process
- Use of landmarks, colour and texture to help with wayfinding
- Thought for colours and contrasts in the fitout.
- Non-flickering LED lamps and lower lighting levels – when compared to BCO (British Council of Offices) standards – are more welcoming and easier on the eyes.
- Qquiet and calm spaces on each floor.

Read more at [BBC Cymru Wales Broadcast Centre - Neurodiversity](#)

The spaces and features we like

Sensory Viewing rooms at Sunderland AFC

Chris and Sally's House in Watford

Image credit Dulux
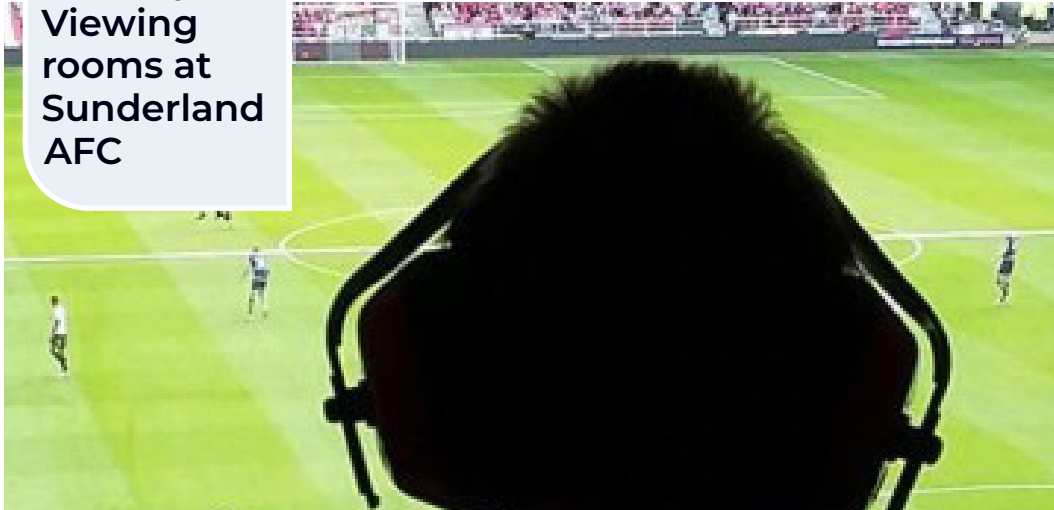
We love the inspiration behind Peter and Kate Shippey's campaign to provide a safe and inclusive place for their son, Nathan who wanted to watch live football. Nathan has autism and as a consequence struggles with the noise and crowds, so needed an appropriate environment to watch a live match in.

Peter and Kate Shippey innovated the concept of Sensory Viewing Rooms in sporting stadia providing a quiet space to watch the match. Since the first room opened at the Stadium of Light's room it's been joined by similar facilities af clubs including Arsenal, Liverpool, Middlesbrough and Watford.

Read more at The shippey campaign

Chris and Sally's House is a project to develop and test design solutions that are supportive of an ageing population staying in their own homes. The 100m² Victorian house has been adapted to cater for different types and stages of Dementia.

We especially liked the colour palette used in the project, led by Dulux who have also produced a colour guide for people with dementia. See this here.
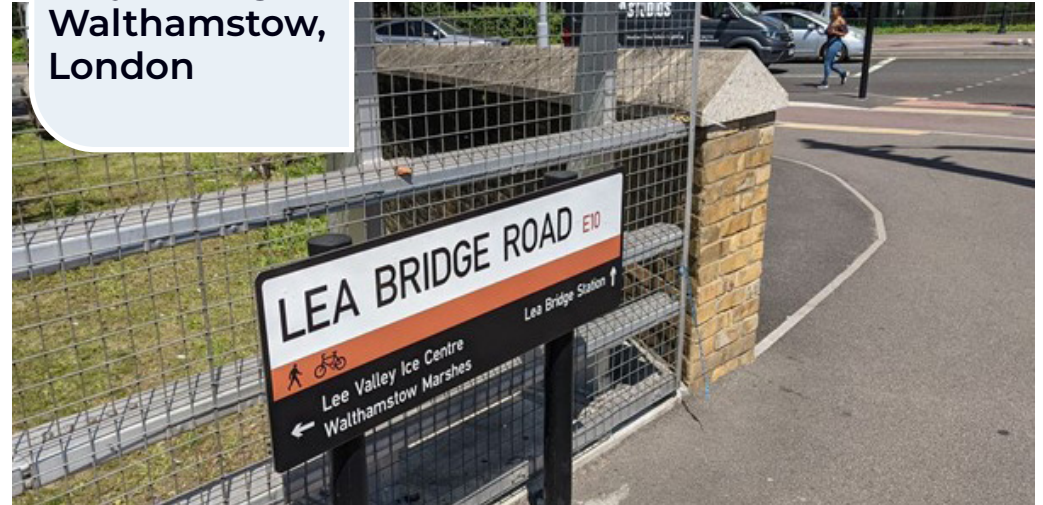
The spaces and features we like

Alfred Place Gardens, London

Located next to Tottenham Court Road in central London, Alfred Place Gardens provides a green, oasis of calm in a busy part of the city. This area gives places for children to play in a safe space, and also provides a calm place to unwind and also for everyone to relax, sit and enjoy tranquility.

Wayfinding in Walthamstow, London

While simpler than the TfL fingerboards these signs provide simple, clear directions alongside place signs.

The spaces and features we like

Orford Way,
Waltham
Forest,
London

London Borough of Waltham Forest trialled an integrated set of measures to reallocate road space to public space. A high proportion of vehicles using Walthamstow Village were exploiting it as a cut-through between surrounding main roads, often at high speed.

The objectives were to:

- Reduce the amount and speed of through-traffic using residential streets.
- Improve the look, feel and safety of Walthamstow Village for all road users.
- Encourage environmentally sustainable travel choices.
- Create a 'living consultation' to enable residents and businesses to experience the changes in real life.

The completed scheme is a calmer place, easier to walk and with green spaces suitable for all to relax in.

The spaces and features we like

Bonnington Square, Vauxhall London

The creation of the 'piazza' in Bonnington Square was a resident-led project born out of a highly collaborative partnership with Lambeth Council.

The community helped to transform the area's derelict and vacant houses and central square, creating a garden and café, run by local people.

Residents proposed a scheme to slow traffic and provide space for outdoor dining and social activity. Complementary surfacing materials define the space and link the café area to the communal gardens opposite.

The transformation of this once traditional local street has created a focal point for the local community, which is used for different activities during the week and year.

It also provides an oasis of calm in a busy area.

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This white paper is just the start of the process. We're keen to learn more and to exchange views. So if you've ideas, examples of great places, or any feedback on our paper, do tell us.

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WSP is a leading engineering professional services consulting firm which supports significant projects in both the built and natural environments. We provide engineering and design services to public and private sector clients in the transportation and infrastructure, property and buildings, earth and environment, power and energy, resources and industry sectors, as well as a strategic advisory offering.

We have more than 40 offices across the UK and Ireland. Our team of over 8,700 technical specialists and strategic advisers in the UK is part of a talented family of more than 65,000 global changemakers, transforming what's possible to build a smarter, greener future for all. Together, we deliver innovative solutions to solve complex problems for our clients and the communities we serve, meeting both the needs of today and addressing the challenges of tomorrow.

WSP takes pride in leading the way we collectively tackle the climate emergency and in October 2020 we announced our commitment to halve the carbon footprint of all designs and advice provided to clients by 2030, a first in the engineering consultancy sector. Having since aligned our carbon reduction targets with the SBTI's science-based Net-Zero Standard, we will achieve carbon neutrality in our UK operations in 2025. Globally, WSP has committed to achieving net zero emissions across its value chain by 2040.

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