Sight Line

Designing Better Streets for People with Low Vision

by Ross Atkin

Supported by

Commission for Architecture and the Built Environment

Royal College of Art
Postgraduate Art and Design

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Foreword

The Royal College of Art Helen Hamlyn Centre provides a focus for people-centred design and innovation at the RCA in London, the world's only wholly postgraduate university institution of art and design.

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→ Access for all to the built environment is right at the heart of inclusive design. That is why the Helen Hamlyn Centre at the Royal College of Art takes such a keen interest in changes to the street environment. Recent development in street design have been welcomed by many but criticised by some social groups because they feel excluded. The debate in the visually impaired community about the value of shared space illustrates this point – here is an innovation that rethinks a key aspect of the urban realm but leaves people with low vision feeling unsafe because key wayfinding features have been removed.

Clearly, not enough is known about how visually impaired people go about navigating their street environment on a daily basis. This in-depth study of eight people with sight loss sets out to extend our knowledge in this area and look at the design implications. Sight Line is a project that we have wanted to undertake for a long time and we are grateful to CABE for partnering with us. I believe that there are two significant outcomes that researcher Ross Atkin has achieved: first, a novel mapping technique for understanding the different stimuli that people with sight loss use to get around; and second, a set of design proposals that aim to make our streets more user-centred for all in the community.

CABE is the Commission for Architecture and the Built Environment. We provide independent design advice and direct technical support to projects across England. We champion and lead the public and professional debate about how to create great places that improve quality of life.

CABE

→ CABE champions the delivery of good design, and we believe that good design should be inclusive design. For us that means designing and managing places that we can all use with equal ease and dignity.

Our streets and civic spaces make up 80% of urban public space. These are spaces that we have no choice but to use as we go about our daily lives. They should provide the best possible experience for everyone. We think that intelligent design solutions can play a crucial role in creating better public spaces, which is why we asked the Helen Hamlyn Centre to partner with us on Sight Line. The brief was simple: gain an understanding of user experience and professional practice in order to identify changes that will help deliver better streets for people with low vision.

Sight Line has generated a number of findings and recommendations directly relevant to designers, policy makers and politicians interested in creating vibrant and inclusive streets. The user centred approach of Sight Line makes a pivotal contribution to the discussion about the ways in which design can help create great streets for everyone.

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Introduction

→ Sight loss can affect a person's independence more than any other disability. Unsurprisingly many people who lose their sight never go out unaccompanied again. Those that do overcome enormous difficulties to do so. These difficulties are very often magnified by inconsiderately designed streets. Small, inexpensive changes to these streets could make their lives much easier. More importantly they would allow those who currently feel they can not go out to lead fuller, more independent lives.

Sight Line is a partnership between CABE Space and the Royal College of Art Helen Hamlyn Centre it takes a fresh look at how the needs of people with visual impairments can be better addressed in the design of public spaces. The study has used design research methods to understand in great depth how a small sample of people with different visual impairments navigate their local environments.

This publication is based on findings and insights from the research. Due to the methods used and the number of people involved, the research is strictly qualitative and this publication should not be confused with nationally agreed guidance based on large samples and widespread consultation.

Sight Line is about how eight real people with sight loss actually experience the urban environment and what could be done to make them safer and more comfortable. It is hoped that the insights and practical ideas in this publication will broaden the understanding of those professionals who design our streets and help them to create places that are both elegant and accessible.

Why Now?

→ The last few years have seen a significant change in the way public spaces are put together. Politicians, planners and designers are reassessing the role of our streets, reestablishing the balance between their function as conduits for traffic and places for people. This process has stimulated a radical rethink of the physical elements that constitute a street, with long established ways of doing things challenged in practice at sites up and down the UK.

Some people with disabilities have felt that their needs have not been addressed in this process and that these new streets are less accessible to them than the ones they replace. Schemes that include a level surface have generated especially intense controversy, with a very public argument erupting between some groups representing people with disabilities and the design establishment.

With the Disability Discrimination (1995, 2005) and Equality (2010) Acts mandating more accessible environments, this raises legal questions. More importantly as a society, if we are spending scarce funds on 'improving' our streets, we should be entitled to expect them to work better than they did before, for everyone.

This situation presents an exciting challenge for designers. Just because formats are long established does not mean they are necessarily optimal. The process of rethinking our streets from scratch could easily lead to designs that improve on traditional forms in terms of social inclusion. This can only be achieved, however, if designers acknowledge, understand and respond to the diverse requirements of the people who use the streets. Sight Line seeks to further this process by presenting the issues and experiences of people with visual impairments.

Why This Matters

→ Visual impairment is a high incidence disability. There are estimated to be two million people in the UK who suffer from sight loss. [01] Of these only 300,000 are formally registered as blind or partially sighted. Of the registered blind population 65% are 75 or older. [02]

For these older people, both registered and unregistered, their visual impairment and associated loss of independence can have dire consequences for their quality of life. The statistics paint a miserable picture. 62% live alone with 46% having contact with someone from the outside world less than once a week. Of those living alone, 82% are in poverty compared with 21% of pensioners in general. 59% of them get out less often than before sight loss and 29% cite the inability to get out and about as the most difficult thing about losing their sight. 44% of them have had a serious accident or fall due to sight loss. [01] As our population ages, more and more of us are likely to find ourselves in this situation.

It is not just the independence of older people that is adversely affected by sight loss. Nearly half of all people registered blind or partially sighted feel like they would like to leave their home more often if they were able to. Only 46% of them make journeys on foot whilst 29% feel that they cannot go out at all unaccompanied. [03] It is worth noting here that it is not just the objective safety and accessibility of an environment that affects a person's independence but also their perception of it. One or two bad experiences can stop someone going out for good.

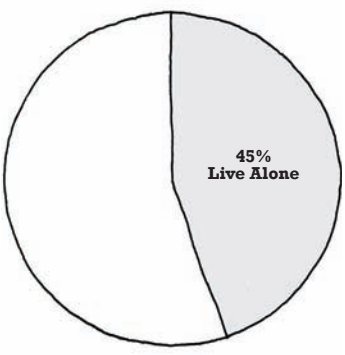
Independence is important not merely as an end in itself; it can affect a person's helth and well-being. People who are excluded from the urban environment can suffer health problems such as those caused by a lack of exercise, poor access to health services and poor nutrition due to difficulties getting to shops.

These statistics reveal a large number of people whose lives are significantly diminished by the inaccessibility of the urban environment. More accessible streets would stop these people feeling trapped in their homes and help them lead richer, more independent lives. If their needs are considered properly in the design of our streets, far greater accessibility could be achieved without added cost. The fact that many people with sight loss believe we are moving in the opposite direction should be a cause of great concern to anyone with an interest in the public realm.

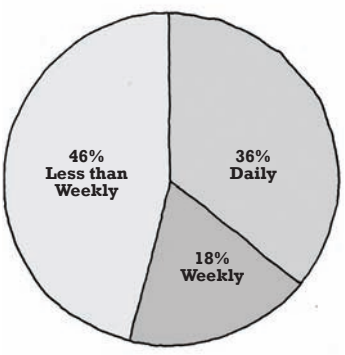
"I don't go out very often because the road I want to show you is near by, and I have to use it to go anywhere, and now I've got a phobia of it"
Long Cane User, Hackney

"I feel unsafe. As a human being when you feel your life is in danger you have a physical response to it. That just made me feel nervous and uncomfortable and unhappy and blind and you just don't want to be feeling that way"
Guide Cane User, Barnet

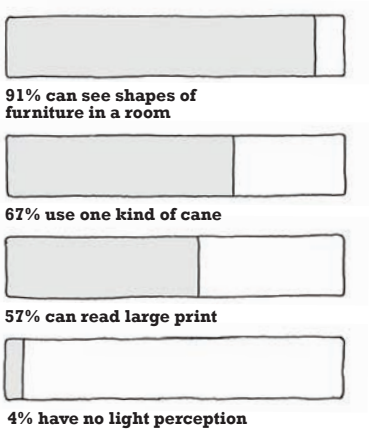
Living Circumstances of People Registered Blind or Partially Sighted [03]



Contact with Someone from Outside the Home for Older People with Sight Loss [01]



Degree of Usable Vision of People Registered Blind or Partially Sighted [03]



Methodology

→ Sight Line is based on several strands of research. A series of expert interviews were conducted with major stakeholders in the shared space debate as well as people conducting pertinent research. Observed journeys were conducted with eight participants with different visual impairments and mobility tactics. An immersive experience was undertaken by the author who was blind folded and navigated an urban environment using a long cane and guide dog. A survey was made of navigation provision for people with sight loss across London by reviewing local authority streetscape manuals, interviewing practitioners and surveying actual streets.

The observed journeys were conducted in participants' local areas. These were journeys that the participants would routinely make unaccompanied, for example to a local amenity, shop or station.

During the journeys the participants were asked to describe how they were orientating themselves and how comfortable they were feeling as well as being invited to comment about any particular street features. In this way opinions and behaviours were tied to particular locations and features whilst observations were based on what people actually did rather than what they say they did. This process was captured on video.

From these videos, maps were created of each journey that linked experiences to spatial locations whilst preserving the journey narrative.

In order to summarise these maps and draw a more quickly accessible picture of the information sources used by each participant to navigate, resource maps were produced. They present a qualitative picture of the extent to which different participants use different elements at different spatial scales. Using these resource maps the effects of changes to the streetscape on different people can be more easily understood.

"I would now have to listen until there was a break in the traffic or for a pedestrian to come along who would give me some assistance."

"There is a break in the traffic now, it's safe for me to cross."

"Now we've got some real issues for me because we've got a bus shelter here that I've got to work my way around."

"And the pavement turns in and out and around so I've got to keep as close to it as I can but avoid anyone who might be in the bus shelter."

"This shadow of the overhang of the bus shelter—so I'm going to step a yard further out to avoid anyone who is here."

(Why do you use the wall line, not the kerb line?) "I just don't feel safe over there, at least I know I can't be hit by a car using the wall line."

The Participants

→ The eight people on which this research is based were selected to present a representative sample of the visually impaired community in and around London. Between them they cover a wide spread of ages, degrees of sight loss and urban contexts. Three are long cane users, three rely predominantly on their sight, carrying guide or symbol canes, and two are guide dog users. Five had received formal mobility training either from Guide Dogs for the Blind or their local authority.

Findings

SIMILARITIES

→ Before dealing with the differences between participants it is worth considering what requirements they have in common.

Sight loss affects a person's ability to pick up information from the surroundings. Some of this can be replaced with tactile or audible information but much cannot. People deal with this by relying on their mental maps of an area to a much greater degree than those with sight. This meant that predictability in their environment was essential to all participants. Several got into difficulties on the actual observed journeys because of unexpected elements on their routes and they all expressed a preference for predictable, straightforward routes. This is a major difference from the sighted community, many of whom like to experience streets in a more spontaneous, social manner.

"I find road works very disorientating, when people are diverted"
Symbol Cane User, Westminster

The other preference that cut across all of the participants was for pedestrian-triggered signal-controlled crossings with audible beeping and/or tactile rotating cones. As would be expected, detecting approaching traffic presents a problem for everyone with sight loss and crossings that allow them to assert their priority over traffic and give them confidence that it has actually stopped are very helpful. Some participants were unprepared to cross roads without such a crossing.

Finally, many of the same things that other street users appreciate such as smooth, even paving and streets free of obstructions are very helpful to all people with sight loss, significantly reducing their risk of trips and collisions whilst making it easier to discern useful tactile information.

"Shopping for me is about going in, getting what I need and getting out avoiding as many pitfalls as I can"
Long Cane User, Bromley

VARIATIONS

→ The way a person with sight loss navigates a street is the result of a complex combination of many practical and biographical factors. These include the manner in which they lost their sight, their main mobility aid, the training they may have received, the extent of their usable sight, the configuration of their local streets and their personal characters and preferences. Because of this every participant had a slightly different way of navigating.

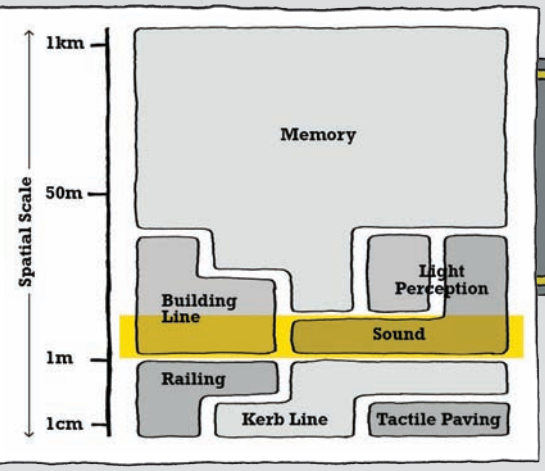
Across the group these variations were significant enough to mean that features that were helpful to some people could actually present a hindrance to others.

Of the factors outlined above, a participant's main mobility aid was by far the most influential. People who use the same sort of aid presented sufficiently similar traits to be grouped together. By considering these three groups—people who rely on their residual sight, long cane users and guide dog users—we can begin to build a more nuanced picture of what a street might look like that included them all.

On the following pages the requirements of these different groups will be outlined and their 'perfect streets' illustrated.

Navigation Resource Maps

Navigation Resource Maps are a new way to depict the way a person different sources of information to navigate at different scales. A slice through the map at any level indicates the different sources of information used at that scale and their relative importance. The maps presented for the three user types on the following pages are generalised from those drawn for individual project participants.



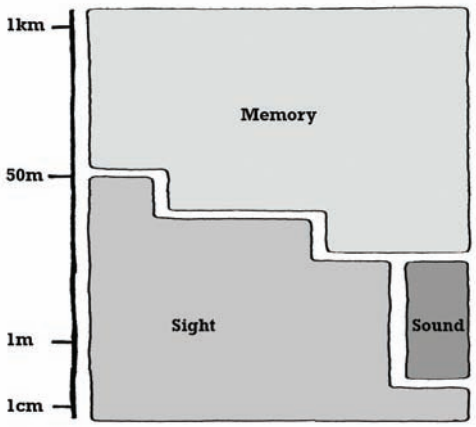
Residual Sight Users

This group makes up the majority of people with sight loss. Typically their sight will be bad enough to be registered blind or partially sighted but still of some considerable use. Usually they will have had no mobility training but will often carry a guide cane across the body for protection and to check for level changes, or a symbol cane to indicate their visual impairment to other street users.

For residual sight users, tonal contrast is the most useful source of information. A strong tonal difference between footway and carriageway and between street furniture and the surrounding paving is very helpful. Yellow lines painted beside kerbs to deter parking are also useful. Many residual sight users will investigate any contrast change they encounter with their cane so decorative patterns and other meaningless tone changes in paving can cause delays and confusion.

Unpredictable changes in level, due to either insufficient or inconsistent tonal changes can also cause problems with tripping or falling. Thus kerbs are of little benefit to this user group and can sometimes cause problems. Residual sight users feel uncomfortable in crowds because of the risk of collision and so feel more comfortable on wide, spacious, uncluttered footways and pedestrian areas.

Information sources used by residual sight users at different scales



" I'd always make the effort to go down the back streets rather than following the crowds"
Symbol Cane User, Westminster

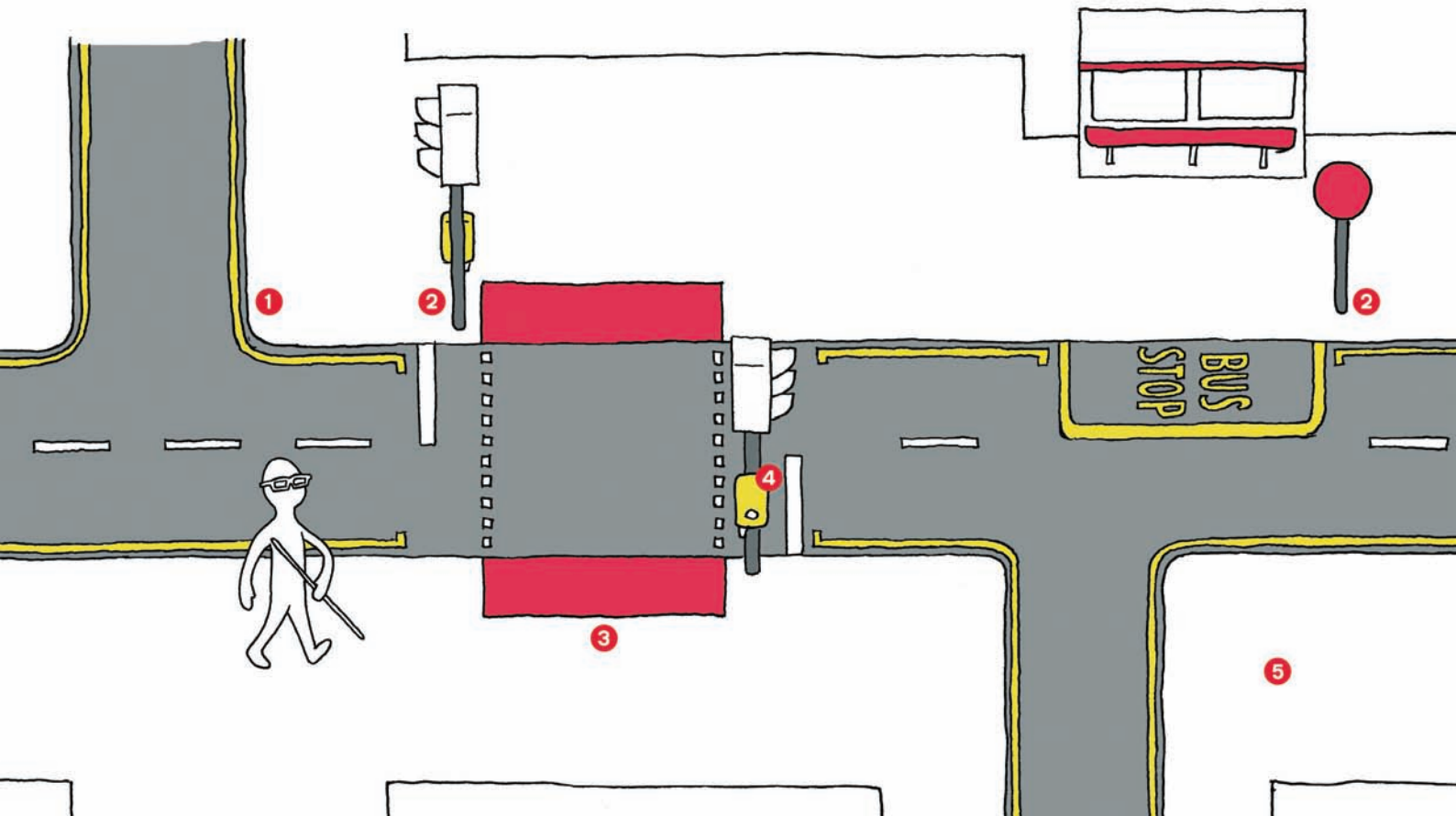
1 Level surfaces can be helpful to Residual Sight (RS) users as they can often misjudge the height of kerbs and trip. A strong tonal contrast and yellow lines allow them to distinguish the carriageway from the footway.

2 Strong tonal contrast between street furniture and surrounding paving helps prevent collisions for RS users.

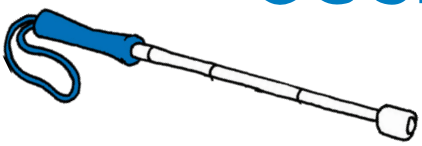
3 Coloured paving helps RS users locate the crossing point.

5 Wide footways help RS users avoid collisions with other pedestrians.

4 Control boxes with tactile rotating cone informs RS users if it is safe to cross.



Long Cane Users



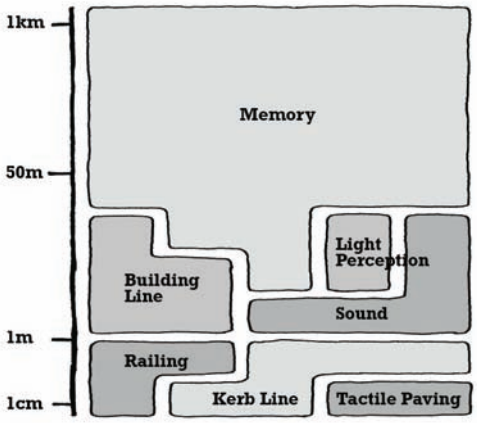
Long canes are a mobility aid used primarily by people who have very little usable sight. Their users will usually have undergone a programme of mobility training to teach them how to use the cane and often also how to navigate some particular routes in their local area. The cane has a roller tip on the end which is usually swept from side to side across the ground. In this way changes in level and texture can be perceived as well as obstacles detected and identified.

Long cane users rely predominantly on tactile and audible sources of information. In order to ensure they are walking in a straight line, they will usually attempt either to walk along the building line or between the building line and the kerb line. In some situations they may also follow the kerb line but many feel that this is dangerous. Footways that are not too wide, with unobstructed building lines, are the easiest for long cane users to navigate.

Pedestrianised areas present long cane users with problems. They usually follow a building line likely to be obstructed with shop advertising boards and will often collide with people going in and out of shops. If they diverge from the building line they can often find themselves lost in space and totally disorienated. The removal of street furniture as part of decluttering efforts can have an adverse effect on long cane users, removing useful navigational cues such as guardrails around crossing points.

Level surfaces can lead long cane users to be unable to distinguish between footway and carriageway. Generally when it is carefully and consistently applied, blister paving can compensate for this to a degree. However long cane users are often unable to recognise the boundary between blister paving and roadway. Long cane users can usually detect small level changes, such as 25mm kerbs if they are well defined.

Information sources used by long cane users at different scales



"I have to follow the building line; it's the safest way for a blind person"
Long Cane User, Meadway

1 Guidance paving in pedestrianised area can help Long Cane (LC) users avoid using the frequently obstructed building line.

2 Guardrail can help LC users locate the crossing point.

3 Tactile paving 'tail' can alert LC users to a controlled crossing.

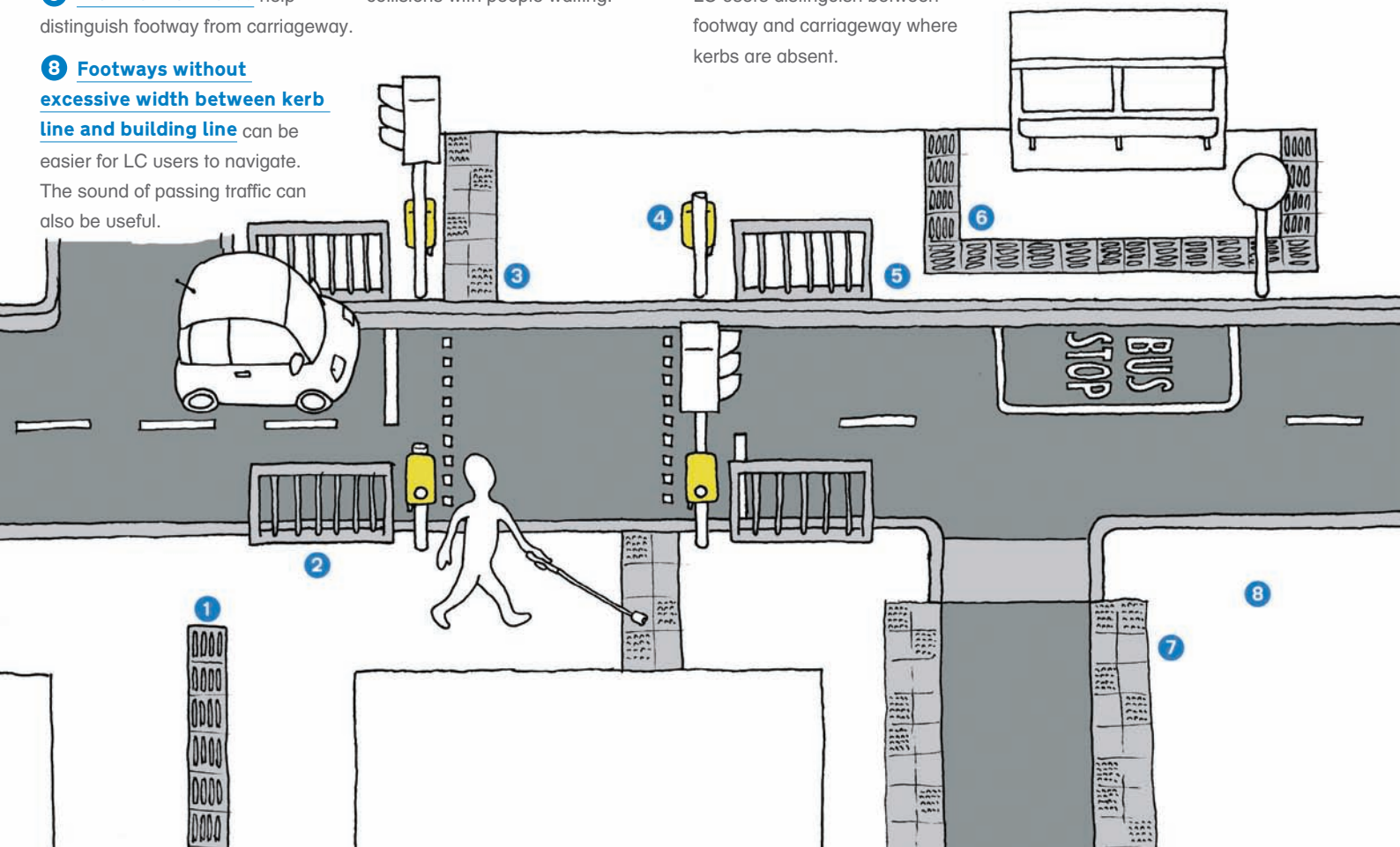
4 Control boxes with tactile rotating cones on both sides of the crossing mean LC users do not need to push past other pedestrians to find out if they can cross.

5 Well defined kerbs help distinguish footway from carriageway.

6 Guidance paving around bus stop can help LC users avoid collisions with people waiting.

7 Tactile paving along full length of level surface helps LC users distinguish between footway and carriageway where kerbs are absent.

8 Footways without excessive width between kerb line and building line can be easier for LC users to navigate. The sound of passing traffic can also be useful.



Guide Dog Users

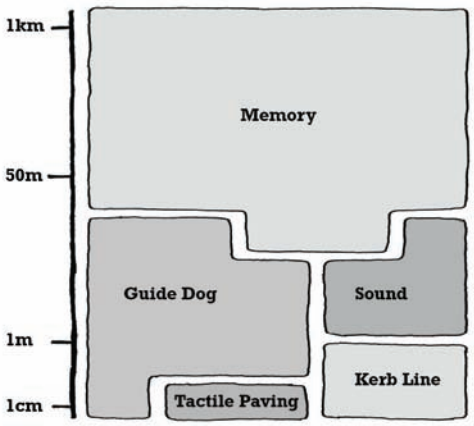
There are 4,500 working guide dogs in the UK. Whilst their users represent a small fraction of the total visually impaired population, they are often amongst the most mobile and therefore most intensive users of streets. Guide dogs are trained to walk down the centre of the footway avoiding obstacles and stopping or pausing at kerbs. They are also trained to locate crossings and entrances. Most guide dog users also carry a long cane in case they get stuck or the dog has a problem.

Compared to long cane users, guide dog users have a much more limited flow of information from their surroundings. Their only source of tactile information is what they feel through their feet and from feeling the dog go up and down at level changes. Guide dogs appear to usually recognise a traditional kerbstone, change in paving tone and yellow lines as a kerb, even if it is part of a level surface. In this situation, however, were the dog to fail to signal the kerb (a situation that is quite frequent) the user has no way of knowing that a kerb was crossed. This can put the user in danger and also make the regular reinforcement of the dog's training, through behaviour correction and praise, difficult. Blister paving can be very helpful in this situation. It can also reassure a guide dog user that their dog has brought them to a crossing point.

Given a lack of other information, guide dog users rely to the greatest degree on the sound in their environment, using the sound of traffic and the acoustics of buildings in very sophisticated ways, to situate themselves. For them flowing traffic is a major navigational asset, making very quiet streets and pedestrianised areas more difficult to navigate.

If a guide dog cannot detect a space big enough to fit through it will just stop, leaving its owner stranded. Footways crowded with people or wheelie bins can present problems in this way so wider ones are better for guide dog users.

Information sources used by guide dog users at different scales



"I can feel (the blister paving), that's how I know I am at the actual crossing"
Guide Dog User, Barnet

1 Well defined kerbs help distinguish footway from carriageway.

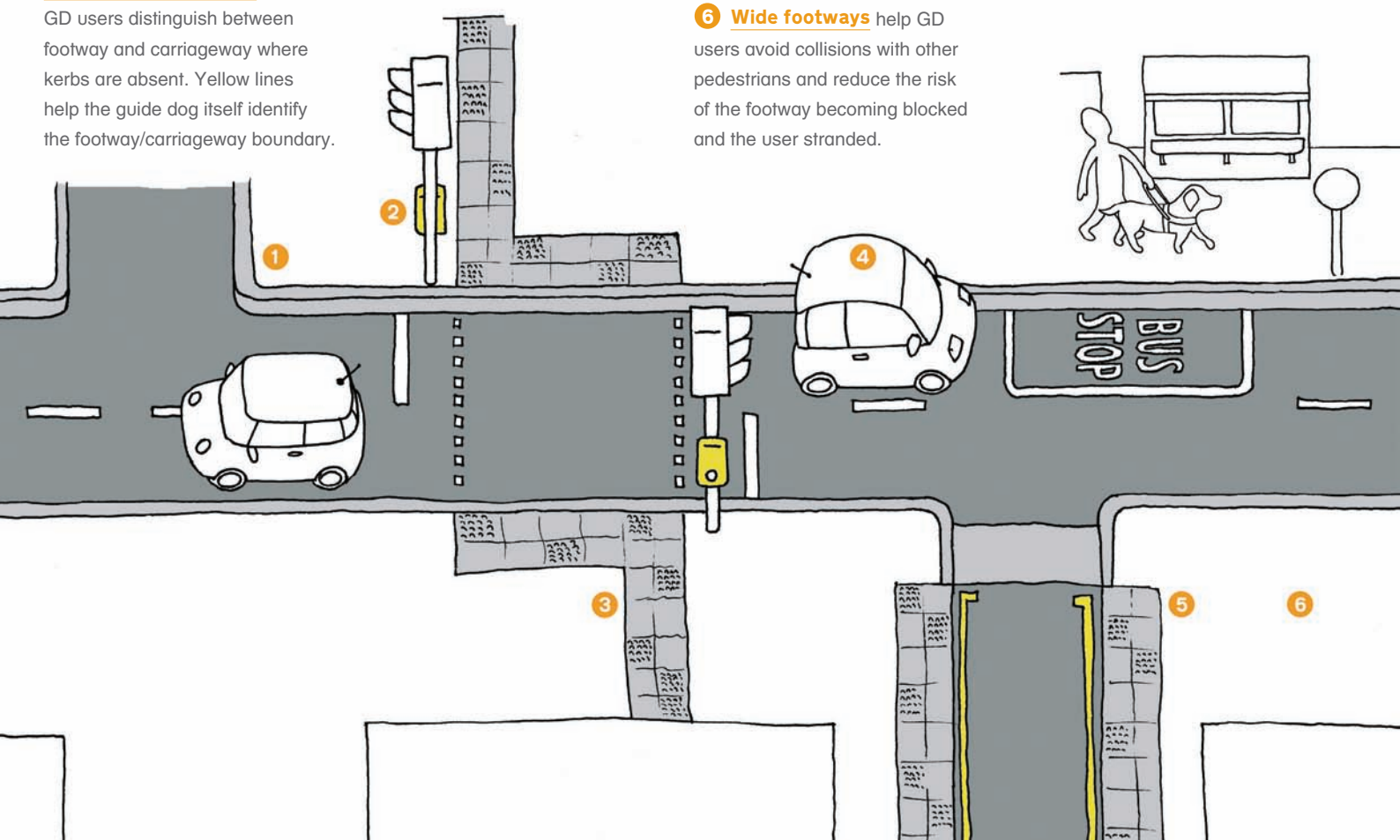
2 Control boxes with tactile rotating cone informs Guide Dog (GD) users if it is safe to cross.

3 Tactile paving reassures GD users that they are at the crossing point. The tail reaching to the building line can help with locating the crossing.

4 The sound of flowing traffic can be extremely useful for GD users helping them to orient themselves and walk in a straight line.

5 Tactile paving along full length of level surface helps GD users distinguish between footway and carriageway where kerbs are absent. Yellow lines help the guide dog itself identify the footway/carriageway boundary.

6 Wide footways help GD users avoid collisions with other pedestrians and reduce the risk of the footway becoming blocked and the user stranded.



Real Streets

Now we are acquainted with the three basic types of visually impaired street user and their requirements, it is time to move from 'perfect streets' to real streets. Over the next few pages we will explore how the features found in actual streets affect different users and how those elements might be deployed differently to make people's lives easier.

RS Residual Sight Users LC Long Cane Users GD Guide Dog Users

Tactile Paving

Colour and installation is as per the guidelines. However it is only deployed across a small portion of the level surface. This area in which it is deployed is no more appropriate a crossing point than any other part of the level surface. It is therefore providing very little useful information to GD and LC users.

Painted Bollard

Tall bollards with a strong tonal contrast to surrounding paving in a variety of lighting and weather conditions reduces the risk of collision for RS users.

Bollards may assist LC users in locating the edge of the footway in the absence of a kerb.

Yellow Line

Yellow lines help RS users to identify the edge of the footway.

Level Surface

This wide expanse of level surface without any tactile demarcation between footway and carriageway could cause LC and GD users to drift into the path of traffic without noticing.

Tactile Studs

Studs are installed along only 10% of the length of the level surface so are not functioning to warn LC or GD users of the edge of the footway. They may give LC and GD users the false impression that pedestrians have priority where they are installed. Metal studs can be slippery when wet.

Wide Featureless Footway

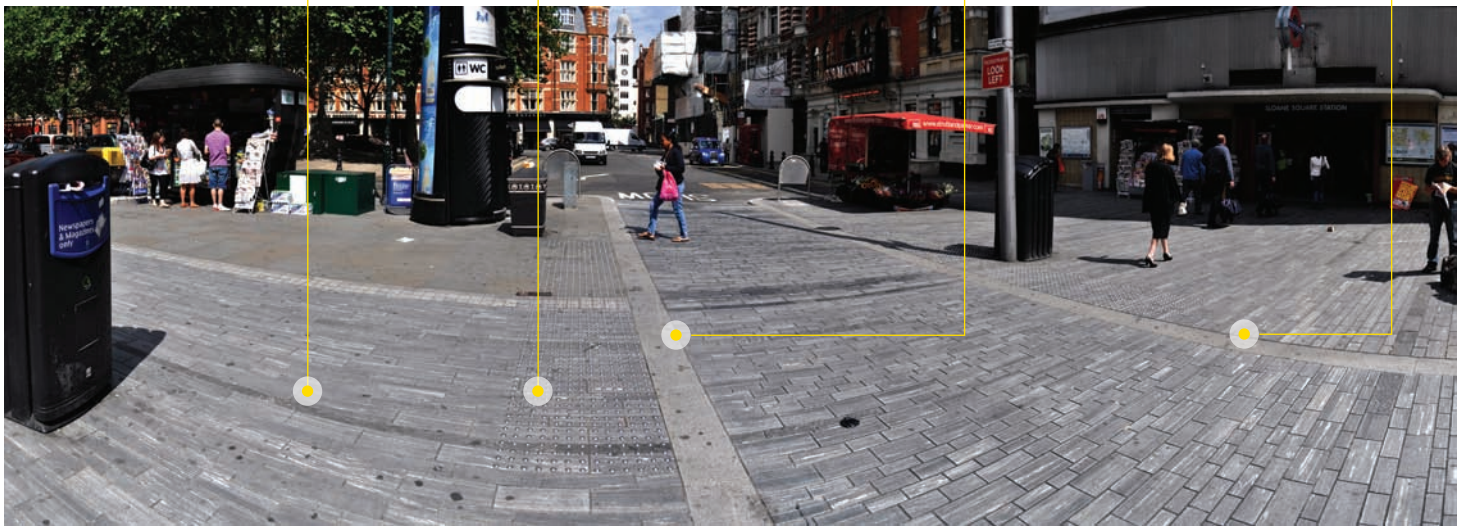
This can be disorienting for LC users, especially if the building line is obstructed. It is often helpful for RS and GD users giving them space to avoid other pedestrians.

No Tonal Contrast

The absence of both tonal contrast between footway and carriageway, and contrasting lines mean RS and GD users are unable to distinguish between them.

No Tactile Demarcation

The absence of tactile demarcation along 90% of the length of the level surface makes locating the carriageway almost impossible for LC and GD users.



Dropped Kerb
A well-defined drop with tactile paving along whole level area can help LC users locate the crossing point.

Tactile Paving
Tactile Paving installed as per the guidance with a strong colour contrast to the surrounding footway and carriageway can help RS users locate the crossing.

Tactile Tail
Tactile Paving Tail that runs all the way to the building line helps LC and GD users locate the crossing as they move down the footway.

Obstructed Building Line
Obstructions on the building line can cause difficulties for LC users who are likely to be attempting to follow it.

Dropped Kerb
Well-defined kerb drops with tactile paving across whole level area helps LC users locate the crossing point and ensures that they and GD users do not unwittingly drift into the carriageway.

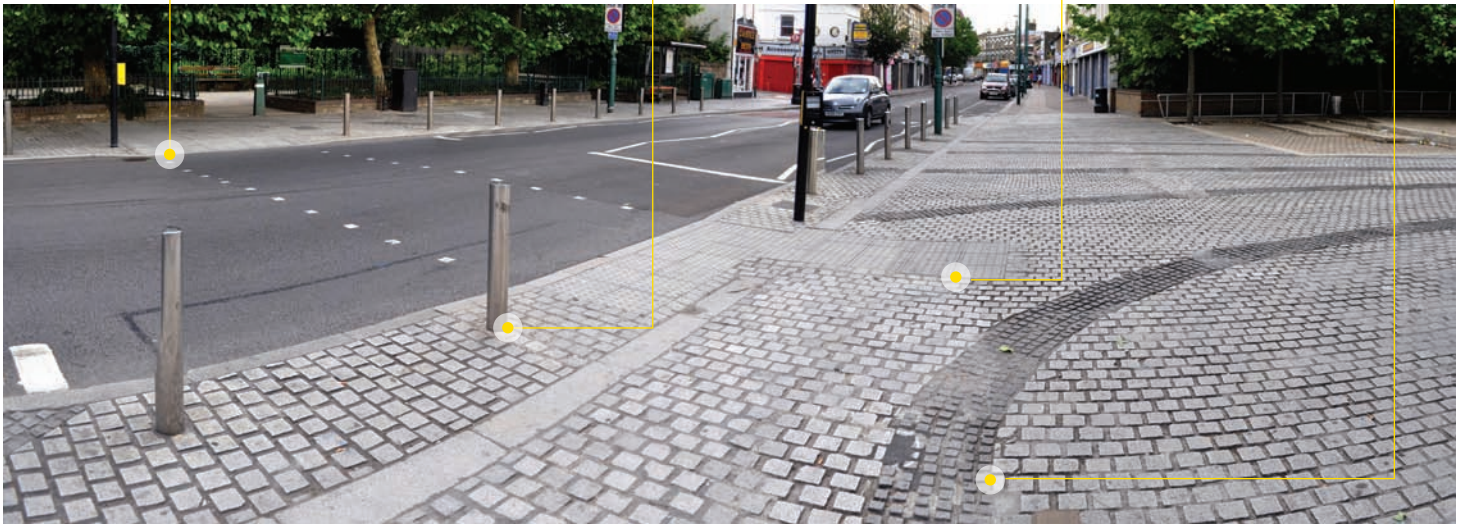
A lack of colour contrast between the level area and the raised area could cause RS users to misjudge level change and trip.

Stainless Steel Bollards
A complete lack of tonal contrast between the bollards and the surrounding paving renders the bollards almost invisible to RS users and increases the risk of collision.

Granite Setts + Grey Tactile
The identical colouration of the tactile and surrounding paving makes identifying the crossing area very difficult for RS users.

The rough granite sets make differentiation of tactile paving from its surroundings almost impossible for LC and GD users.

Decorative Tone Change
The meaningless changes in paving tone can confuse and delay RS users as they will usually have to stop and check for a level change.



Painted Guardrail

Guardrail can help LC users to locate the crossing point. A strong colour contrast with the surrounding paving is helpful to RS users, preventing collisions.

Tactile Paving

Paving is worn out and in need of replacement to be fully usable, especially for GD users. Poor tonal contrast between the tactile and surrounding paving makes identification of the crossing area difficult for RS users. Small block paving in the surrounding area makes locating the tactile area difficult for LC users.

Audible Crossing Alert

Audible alerts can be masked by traffic noise or other sounds. Tactile rotating cones are preferred by most people with sight loss, preferably on both left and right control boxes.

Building Line Obstructions

The building line is obstructed on both sides by cafe tables and chairs and advertising boards making it very difficult for LC users to follow and increasing the risk of cane breakage.

Wide Featureless Space

Navigating open space without features is very difficult for LC users meaning that they must follow the building line. A run of guidance paving through the space would make it much easier for LC users to use.

Meaningless Tonal Change

Meaningless tonal changes will delay RS users as they will often stop and check for level changes. Contrasting lines such as these could be used to guide RS users through the space. However those present here converge on an obstruction.

Rope Partitions

Partitions can assist LC users by guiding them around obstructions such as table and chairs; however the low rope and post type do not perform this function well.

Future Streets

→ The previous section dealt with how the existing palette of streetscape elements, standards and guidance could be better applied in real world situations for people with sight loss. This section discusses issues raised by the research around that palette and proposes possible changes and additions that could be made in the future.

It can be argued that a situation that is already poorly understood, inconsistent and confusing would not benefit from the introduction of new kinds of provision or changes to nationally agreed guidance. To a degree this is true and it is likely that greater improvements could be made by using existing provision better than by making changes. However, set out here, are some areas where current provision is not working properly, or improvements could be made without added confusion.

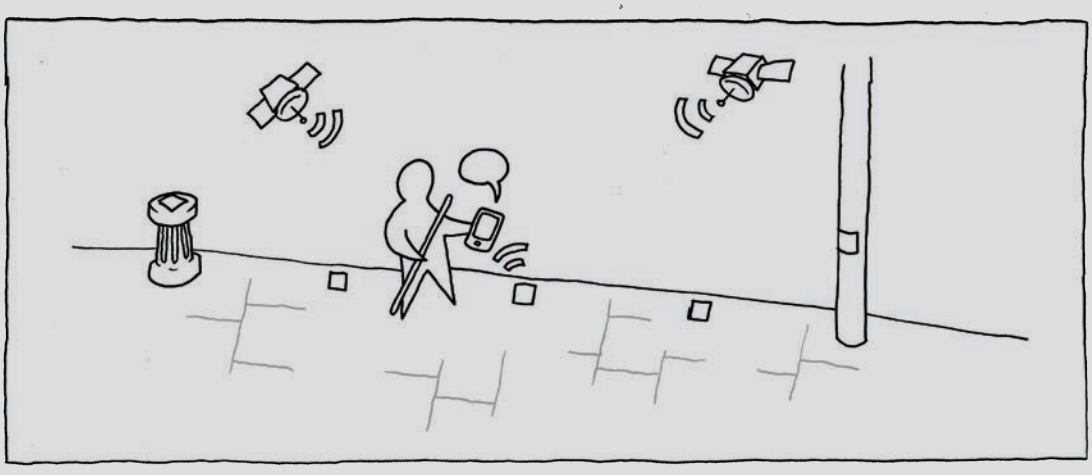
TECHNOLOGY

→ Before discussions about costly changes to the physical streetscape begin it must be acknowledged that a range of technologies, which are becoming increasingly accessible, could make some of those interventions obsolete.

Radio Frequency Identification (RFID) presents the opportunity to embed tags in the environment that can be linked to digital information pertinent to different street users, accessed through a portable device. It is technically possible that a system such as this would be accurate and robust enough to convey information about proximity to a road or crossing. In this way it could replace tactile paving for example. In order to achieve this, however, the device carried by the user would have to be unrealistically reliable. Flat batteries half way home could be disastrous. In addition such devices would need to be distributed to all visually impaired street users who would also need to be trained to use them.

Rather than substituting information currently provided by hard streetscape features, a RFID system could provide useful supplementary navigational information. At this scale, however, in external environments like streets, it is likely that Global Positioning System (GPS) technology would be able to work as well without the inconvenience and expense of embedding physical tags in the environment. GPS systems are already used to great effect by some highly mobile people with sight loss. As their price comes down, usability increases and they become better integrated with mobile phones, they will become more popular.

The usefulness of these systems would be increased greatly if a programme were undertaken to tag the GPS coordinates of locations pertinent to pedestrians with sight loss, such as controlled crossings, and make this data available in a format usable by the systems, much like road map data are currently provided for car systems.



Tactile Paving Challenges

In the course of research with both street users and street designers, several issues have arisen regarding different forms of tactile paving. These are set out here and are followed by proposals for improvement.

MISUNDERSTANDING

→ The guidance on the use of tactile paving includes provision for seven different kinds. None of the project participants were aware of this and, interestingly, neither were any of the three mobility trainers involved in the research. Most participants were aware of, and able to differentiate, only the blister used at crossings and dropped kerbs and the corduroy used at the top and bottom of steps. This lack of understanding appears to extend to the design community. A draughtsperson in the largest paving manufacturer confirmed that designs were rarely compliant with the guidance when they were received from urban designers and architects.

"What does it mean?
Do you need a guide book?"
Guide Cane User, Barnet

Simplify: The lack of understanding on the part of both users and designers about the current system of tactile paving presents a strong argument for a redrafting of the guidance to make it clearer and more accessible. It may also be prudent to remove, substitute or simplify some of the less well used and understood types of tactile paving.

INCONSISTENCY

→ There is a striking inconsistency with which tactile paving, most notably blister, is deployed across different local authorities. This is especially acute in London, where most of the research was conducted, due to the large number of different municipalities contained in relatively compact areas. A walk along Fleet Street, for example, moving between Westminster and The City of London, will involve dealing with a total shift in the way blister paving is applied at controlled crossings. Walking down one side of Boundary Road in St Johns' Wood, blister paving is provided at every dropped kerb, but on the other side of the road there is none. A walk through suburban East Acton involves the total disappearance of blister paving at dropped kerbs just before the Tube station. These stories repeat themselves at local authority boundaries all over London, and also in many cases within single boroughs. Such inconsistencies significantly undermine the usefulness of tactile paving, even where it is installed in line with national guidance.

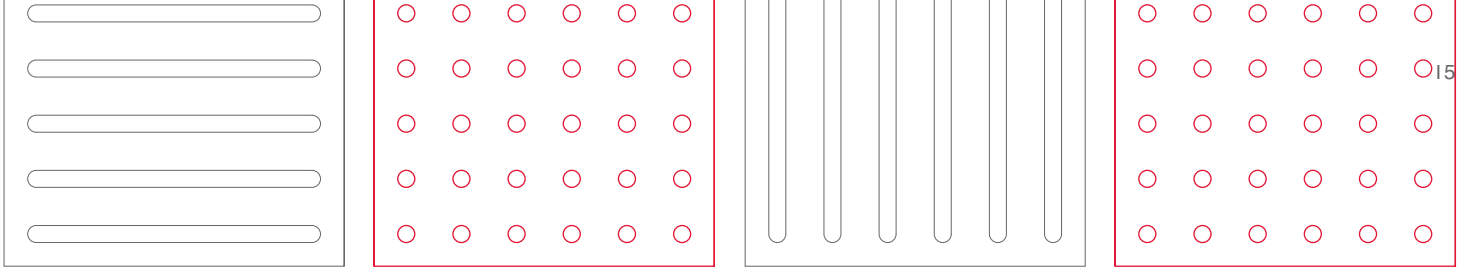
"I'm not a great believer in tactile paving;
it is an indicator but it's not a very accurate indicator..."
Long Cane User, Bromley

Coordinate: Stricter adherence to the nationally agreed guidance and better coordination between neighbouring local authorities would do much to improve the consistency of application of tactile paving making it a much more reliable and useful indicator.

GUIDANCE PATH

→ There are three types of paving tiles consisting of a series of parallel bars included in the guidance; one for the top and bottom of steps, one that indicates priority on a shared pedestrian and cycle path and one that functions as a guidance path. Currently, the guidance path is barely used anywhere. Whilst it would not assist all street users with sight loss, greater use of the guidance path, especially in pedestrianised areas, and to bypass bus stops or other obstructions, would be of great assistance to long cane users. It would allow them to move away from the building line with its associated obstructions without getting lost in space. Interviews with urban designers revealed a reluctance to use the guidance path because of a perceived negative impact on other street users. In addition if, as proposed here, corduroy was more widely used on streets, use of the current guidance path would be confusing.

Redesign: As it is only of benefit to long cane users, and therefore need not be detectable underfoot, the guidance path could be redesigned to present less of a barrier to other street users, to be more easily distinguishable from the corduroy and to work better with long canes.



CROSSINGS & LEVEL SURFACES

→ Interviews with street designers have revealed some issues with the national guidance that is contributing to the inconsistency described above. Currently, according to the guidance, the same blister tile should be used to demarcate dropped kerbs at both controlled and uncontrolled crossings, albeit with a different colour and installation configurations. These configurations are neither consistently observed by designers nor easily differentiated by people with sight loss however the difference between the two situations is of crucial importance.
In addition the recent proliferation of traffic tables, raised entry treatments and other level surfaces mean that there are many situations where a tactile demarcation is required beyond the traditional dropped kerb at a crossing point.

Some designers believe that using the blister at an uncontrolled crossing could mislead a visually impaired person into believing they had priority. Because of this, these designers were only using blister at controlled crossings and leaving other dropped kerbs with no tactile demarcation whatsoever.

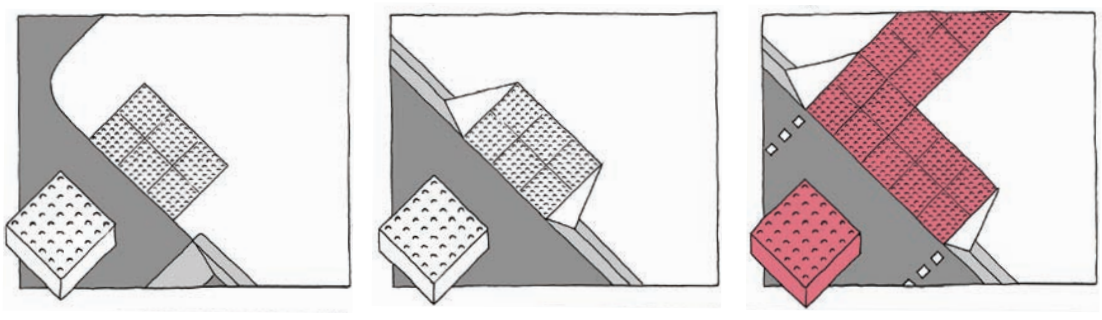
For some street users this situation also caused difficulties beyond just the inconsistency of installation. Some felt themselves that the use of blister at uncontrolled crossings was misleading and dangerous. Another was consistently mistaking the tail of a blister installation at a controlled crossing for a warning of an upcoming side road with a raised entry treatment.

"Although there is blister paving there it is a crossing that would be totally unusable for visually impaired people... As a blind person that is actually leading me into danger"
Long Cane User, Bromley

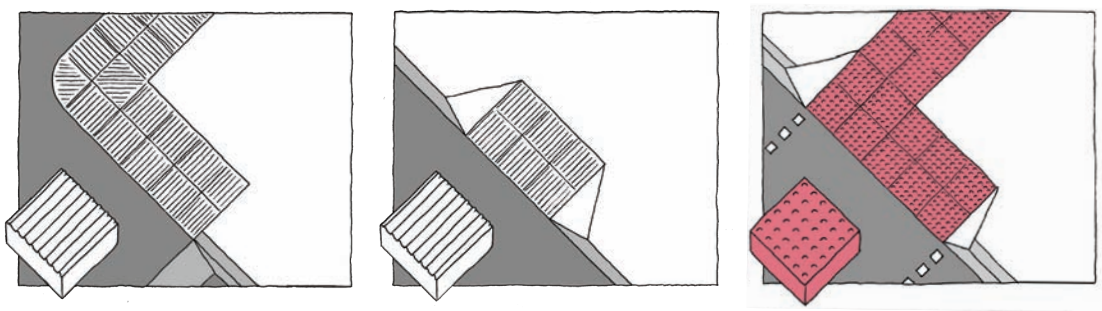
"We only use tactile where there is a controlled crossing because anywhere else it's a hazard. You are basically telling someone who has limited sight that it is a safe place to cross."
Urban Designer, Hammersmith and Fulham

Differentiate: Whilst a simplification of the tactile paving system as a whole is desirable, this particular area would benefit from more sophistication. It is our view that wherever kerbs are dropped, or surfaces levelled **but pedestrians do not have priority over vehicles**, the distinction between footway and carriageway should be made with either corduroy tactile paving, or a new alternative that is more acceptable to wheelchair users. This would leave blister paving to indicate the presence of controlled crossings in an unequivocal manner. Efforts should be made to encourage designers to install it consistently as per the current guidelines. [04]

Current Guidance



Proposed Changes



Proposed Design Briefs

There are some specific areas identified in the research where designing new products would be useful. These are outlined below as briefs to be addressed through further work.

TEMPORARY OBSTRUCTIONS

→ Unpredictable streetscape interventions such as roadworks can create very serious problems for all people with sight loss. Because of the extent to which they rely on their mental maps of an area, small, unexpected deviations can cause them to become totally disorientated.

Currently the paraphernalia put up around roadworks is focused solely on preventing people from falling into holes, a role these products perform adequately for the three low vision user types. There is an opportunity to redesign some of this equipment and its application so it can function as an effective diversion system for our three types of visually impaired street user. A set of languages would need to be developed which communicated clearly with these users, letting them know what was going on, which way to go and returning them to somewhere they could recognise.

As this equipment already consists of quite complicated plastic mouldings with applied colours and graphics, with sensible design it is likely that this could be achievable without adding significant cost or complexity.

MORE INFORMATIVE STREETS

→ The diversity of cues and information derived from the street by the eight different project participants is enormous. There are opportunities to make small interventions to particular streetscape features to augment these information flows. Each intervention would not necessarily be useful to all visually impaired street users but would function to increase the bandwidth of possible information sources. Together they would add up to greater overall accessibility. Below are propositions for some such interventions.

Augmented Traffic Sounds

There is scope to modify the texture of the carriageway at specific locations in such a way that vehicles passing over those areas generate a characteristic sound. Such interventions could be used to increase the information available to someone with sight loss about the configuration of a junction, or the presence of a controlled crossing.

Information Street Furniture

Many streets are littered with poles and bollards. Whilst de-cluttering may succeed in removing some, many are likely to prove necessary and will persist. These could be transformed into valuable navigational assets with the addition of some inexpensively applied tactile information. Simple consecutive numbering of poles on a street would prove useful for

re-orientation as well as aid in the location of shops and properties. Information could also be provided about the direction of and distance to the nearest controlled crossing.

User Centred Street Design

→ This publication has sought to give greater insight into how people with visual impairments actually navigate real streets, thus adding flavour and depth to the general advice already available elsewhere. It has also proposed how some things might be done differently to be more effective.

A major limitation throughout has been the need to generalise from specific information about specific people in specific streets. In doing this, useful information is always lost. When designing an actual street, it is this specific information about how particular local users actually use that street that is most useful to the designer. Only this will really allow him or her to understand the consequences of levelling a surface or removing guardrail at a particular point, or the most useful route for a run of guidance paving.

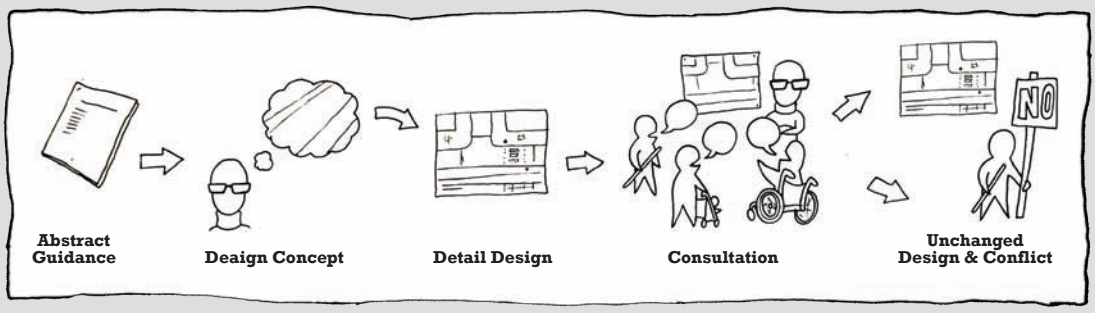
The way in which the design process is currently set up, does not allow the designer to receive this information at the correct time. He or she creates a design based on abstract guidelines and assumptions about user behaviour. Once the design is well resolved, it is put to a limited group of users for 'consultation' at a point when it is usually already too late to make major changes. Users who attempt to get their needs met in the design at this point are often seen as obstructive.

Many of the participants in this project had very strong views about the design of particular parts of their local streets and were keen to articulate them. The client and design teams responsble for the decisions that shape our streets have a duty to take on board this information. If properly considered it can help generate creative and practical design soloutions which balance and address the requirements of different street users.

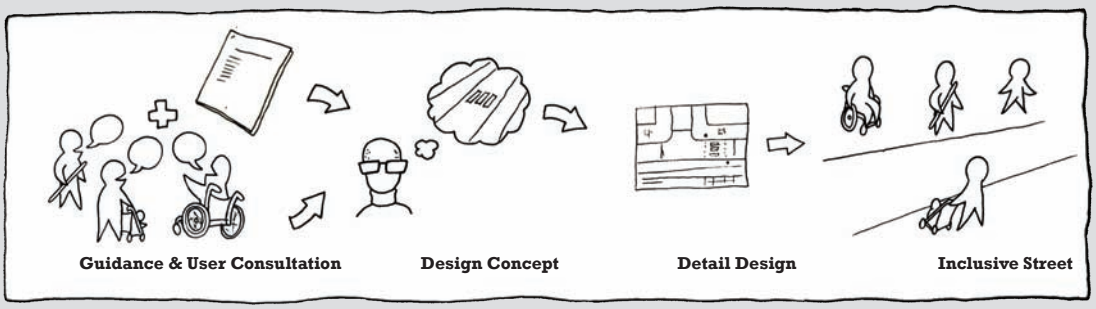
A system that allowed members of the public to document their views and experiences and linked them to specific locations in a way that was then accessible to designers would help solve this information problem. To be workable the system would have to be open and designers could not be obliged to respond to all user requirements. However, by being aware of them at the start of the design process, designers would be much more likely to produce streetscape designs that work well for their users.

Existing internet mapping systems, which already allow users to post photographs and comments, could be adapted to provide this sort of service with little reconfiguration. Smart phone applications could be developed that made the process of documenting issues even easier for street users, or those helping them.

Current Design Process



Inclusive Design Process



Conclusion

→ Being able to go out alone is one of the foundations of an independent life. A great many people with visual impairments find our streets too difficult to use and never attempt this. Those that do, overcome considerable difficulties and risks to do so. As a society we should expect our streets to be improving in this regard, becoming easier for people with sight loss to use. We should be alarmed that many feel we are moving in the opposite direction. We should treat departures from traditional ways of making streets as opportunities to make them much more accessible to more people than they were before.

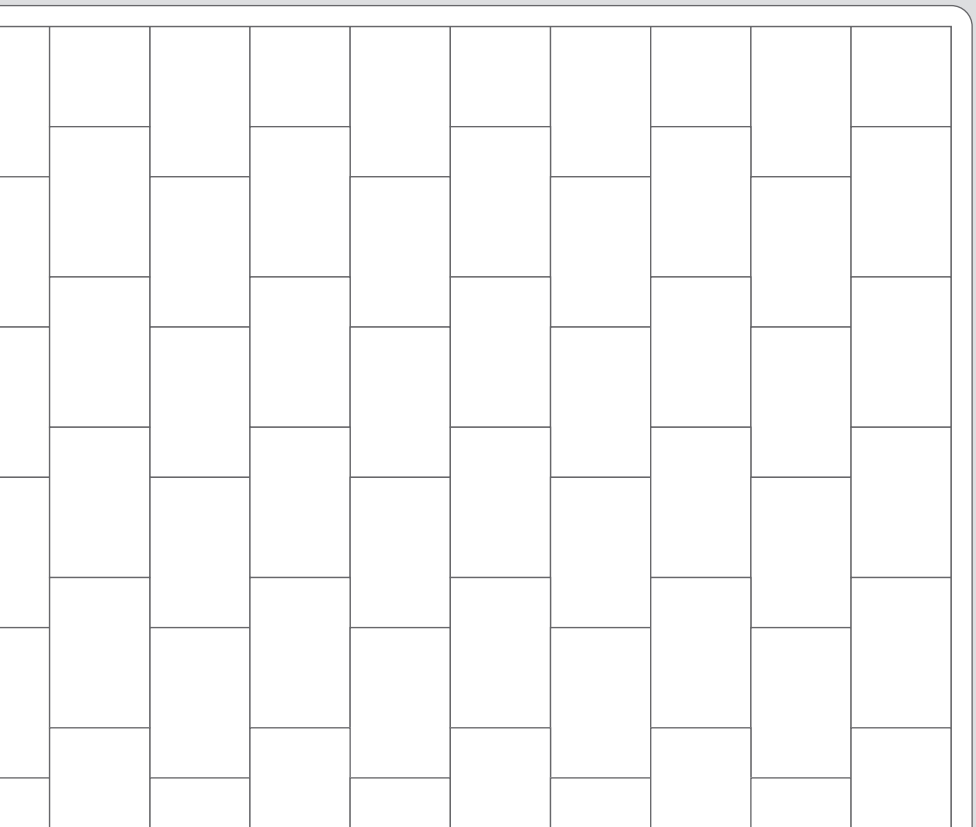
In order to design effectively for people with visual impairments, the variations within that group must be acknowledged. People with sight loss do not represent a homogeneous whole with identical traits and needs, but an extremely diverse population with differing and sometimes contradictory requirements.

By considering three basic user types—residual sight users, long cane users and guide dog users—much of the variation in people's requirements can be better understood. Thinking through how these different users will be affected by streetscape changes allows a more nuanced picture of how effective a particular design would be.

In general, there is more scope for improvement through using existing provisions more sensitively in future street designs than by creating new provision. However there are a few areas where useful changes could be made.

There are some major issues with the guidance and provisions for tactile paving which are preventing it from being as useful as it could be. These are probably significant enough to make a redrafting of the guidance worthwhile, despite the initial confusion this might cause.

Beyond any particular feature or design, there is a wider problem about the process through which the needs of street users, especially vulnerable ones, are addressed in the design of public spaces. New technologies offer the prospect of more open, collaborative and less confrontational ways of consulting the public on the specifics of their local environments. Designers have a greater opportunity than ever before to respond to people's individual preferences and requirements as they remake their places. Only in this way will we really be creating places for all.



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01 Unseen; Neglect, isolation and household poverty amongst older people with sight loss, RNIB + British Gas, 2004

02 Registered Blind and Partially Sighted people year ending 31 March 2008 England, National Statistics, 2008

03 Network 1000; Opinions and circumstances of visually impaired people in Great Britain: report based on over 1000 interviews, Douglas G, Corcoran C, Pavey S, University of Birmingham, 2006

04 Guidance on the use of tactile paving surfaces, Department for Transport, 2003

More Information

01 **PAMELA Research, University College London**
Research has been conducted at UCL's PAMELA simulation lab to test different proposed paving elements as delineators in shared space environments. The first phase of this research has been published by Guide Dogs for the Blind and contains useful information about the impact of different elements on both people with sight loss and those with other mobility problems.
http://www.guidedogs.org.uk/sharedstreets/fileadmin/sharedsurfaces/user/documents/Full_Report_of_design_trials_at_UCL_PAMELA__01.pdf
For more information about ongoing research contact Kim Morgan, kim.morgan@ucl.ac.uk

02 **'Guidance on the use of tactile paving surfaces', Department for Transport**
The nationally agreed guidance for the deployment of seven different tactile paving surfaces. As a guidance document it is not legally binding and is observed to a varying degree by different Local Authorities.
http://www.dft.gov.uk/adobepdf/259428/tactilepavement

03 **I'D GO Project, University of Salford**
A wide-ranging research project looking at the experience of older people in urban environments. They have published some design guidance:
http://www.idgo.ac.uk/design_guidance/factsheets/kerbs_of_Footways_and_Footpaths.htm
They are also currently conducting research specifically into the impact of tactile paving on older people. For more information contact Marcus Ormerod, M.Ormerod@salford.ac.uk

04 **Research Group for Inclusive Environments , University of Reading**
A well established academic research group with special expertise in the use of tone and colour to improve the accessibility of environments.
http://www.reading.ac.uk/kqFINCH/nhe/research/fit/fit.htm
For more information contact Dr. Geoff Cook, g.k.cook@reading.ac.uk

05 **'Kerb your enthusiasm', Parliamentary Advisory Council on Transport Safety**
A report into the Shared Space concept from a policy point of view emphasising the importance of the consultation process to creating successful schemes.

06 **'Inclusive Streets', Guide Dogs for the Blind Association**
Brief guidance published by Guide Dogs on behalf of several other charities representing people with sight loss.

Ross Atkin is an Industrial Designer, and a graduate of the Royal College of Art. His understanding of the details of streets developed through several years working as a designer of street furniture, during which he was involved in numerous streetscape projects up and down the UK. He holds Masters degrees in both Mechanical Engineering and Industrial Design.

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