

## **Designing Shared Space**

Technical Information Note 05/2019

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This information note explains the different types of Shared Space, its associated benefits and issues, and points to and clarifies other sources of information

# 1 Introduction

- 1.1 The term shared space, when applied to the mixing of pedestrians and vehicles in the public realm, means lots of different things to different people. This results in a confused debate of the subject area, exacerbated by the Department for Transport (DfT) issuing often conflicting statements, particularly over the course of 2018. This information note aims to:
  - describe and define the different forms of shared space;
  - help clarify the latest DfT position on shared space
  - outline Inclusive Design issues
  - comment on some structural, layout and maintenance issues
- 1.2 In this note, the updates on the position of the Department for Transport are outlined and highlighted to help clarify a confused situation. It is possible that this position will alter somewhat over the next year. If so, the Landscape Institute will attempt to keep members up to date.
- 1.3 Landscape Architects who have the appropriate knowledge and experience are typically able to play a/the lead role in the design of shared space projects due to their awareness of urban environments and pedestrian movement patterns. Without suitable knowledge and experience, however, it is very easy to make mistakes. Generally, Transport Planners and Highway Engineers will be part of the professional team looking at a shared space project, but they too may be more or less familiar with this specialist area of design.
- 1.4 Pedestrians share most of their streets and spaces with vehicles. Even where a grade-separated pavement exists, they are in immediate proximity to vehicles and are affected by their speed, size and traffic flows. And pedestrians are always going to have to cross a carriageway at some point, either informally or at prescribed crossing locations utilising Zebras, Pelicans, Puffins, Toucans or courtesy crossings.
- 1.5 All the preceding forms of street-crossing can lead to higher or lower level of risk depending on the design of the facility and the context in which they are located. There are good and bad examples of their design or the application of the techniques. The same is true for shared space. It is the design, application and context that make any form of sharing the public realm of higher or lower risk.
- 1.6 Documents such as *Link & Place* by Peter Jones of UCL and *The Manual for Streets* published by the CIHT have promoted the idea of multi-functional streets and spaces where vehicular movement is just one of the functions. Other functions include:
  - pedestrian and cycle movement
  - social interaction
  - trade (shops)
  - cafes
  - a sense of place
  - the setting for historic buildings
  - events
  - exercise

1.7 The concept of shared space street environments has been developed in the UK from its origins in the Netherlands where it is sometimes known as a *Woonerf* (“*living yard*”). There is enormous potential of applying these techniques to:

- improve the pedestrian experience;
- reinforce a sense of place;
- retain or reinstate vehicle penetration to town/city centres including buses and shared modes of transport; and
- improve social, residential, commercial and retail environments
- develop healthier streets

but there has been a lot of controversy and confusion around schemes with:

- blind and partially sighted users in particular feeling threatened or excluded from these environments;
- potentially inappropriate application of the techniques where traffic speeds or volumes are high;
- poor design through lack of consideration or understanding of behaviours; and
- inadequate construction detailing and specification.

1.8 This Technical Note outlines the issues and potential benefits relating to shared space and highlights other sources of information. It focuses on shared space in town centre environments as opposed to Home Zones which are also considered a shared space but will have more specific if overlapping issues.

1.9 A recent document by the Chartered Institute of Highways and Transportation (CIHT) is discussed in this Technical Note. The CIHT recognized that the term shared space has meant different things to different people and that this was confusing the debate. The CIHT reviewed the performance of some existing schemes and identified three typologies of shared space in its document entitled “*Creating better streets: Inclusive and accessible places. Reviewing shared space*” (January 2018):

- a) Pedestrian priority streets
- b) Informal streets
- c) Enhanced streets

## 2 Different types of shared space

2.1 The CIHT recognised that the term shared space has meant different things to different people and that this was confusing the debate. The CIHT reviewed the performance of some existing schemes and identified three typologies of shared space in its document entitled *“Creating better streets: Inclusive and accessible places. Reviewing shared space”* (January 2018):

- d) Pedestrian priority streets: often level surfaces with no defined carriageway that appear to be pedestrianised streets or spaces
- e) Informal streets: where there is a defined carriageway but often contained by low kerbs, there are reduced amounts of standard highway infrastructure such as signals and signs
- f) Enhanced streets: a fairly traditional street layout but with some aesthetic enhancements and reductions in highway infrastructure

These three typologies are explained in more detail in the remainder of this section and are illustrated below:



*Pedestrian Priority square*



*Informal Street (one-way example)*



*Enhanced street (one-way example)*

2.2 The CIHT report recommends “that future schemes seeking to improve the public realm through better street design need be promoted, designed, implemented and monitored against a series of predefined objectives with clear outcomes that can be measured in a consistent way” to enable inclusive environments to be created CIHT, recommend five key areas that should be included:

- inclusive environment,
- ease of movement,
- safety and public health,
- quality of place and
- economic benefit.

## Pedestrian Priority Streets and Spaces

*“Streets (and spaces) where pedestrians feel that they can move freely anywhere and where drivers should feel they are a guest. Under current legislation, this does not give formal priority to pedestrians.”*

- 2.3 The CIHT report goes on to say: *“Street schemes of this type have generally adopted designs that do not appear to contain a well-defined carriageway so that road users (particularly drivers) do not assume that pedestrians need a defined crossing or a driver’s permission to cross the street.”*
- 2.4 One interpretation of this is that pedestrian priority spaces can be designed to appear as pedestrianised spaces to both drivers and pedestrians such that drivers do not feel they have a right of way, so drive at a speed that means they can avoid any form of pedestrian movement. Pedestrians can behave without regard to the movement of vehicles, knowing that it is up to the vehicle to avoid them rather than the other way around.
- 2.5 This form of shared space is perhaps the most likely to be led by a Landscape Architect and provides the greatest freedom of design.
- 2.6 Successful designs tend to be rooted in the surrounding urban form rather than paving patterns, a strong urban form almost certainly encourages lower vehicle speeds, and where Landscape Architects have exploited the uncluttered simplicity of pedestrian priority design to create environments that better exhibit surrounding good quality buildings as well as creating spaces for events to take place.
- 2.7 Pedestrian Priority schemes have been less successful when drivers are not aware they are approaching one. Signage can be used to communicate that they are expected to change their behaviour but this is more effectively achieved by a stepped change in the character of the urban environment or public realm. Too much abstract pattern-making in design, also creates a confusing environment, particularly for blind and partially sighted users or those with neuro-diverse conditions or learning disabilities. Strong tonal contrast is best reserved for tactile paving rather than pattern making.
- 2.8 High densities of pedestrians can improve the functioning of these forms of environment as pedestrians dominate the space, whereas high vehicle speeds and volumes may mean that it does not operate effectively. Vehicle speed and vehicle flows have different effects on the functioning of these environments with higher speeds perhaps having a greater effect on pedestrian comfort than higher flows.
- 2.9 The CIHT report provides some indication on the appropriate vehicle flows for a Pedestrian Priority Space *“Manual for Streets notes that people will treat a street as a space to be occupied and not a road to be crossed when traffic flows are not more than about 100 vehicles per hour”*.
- 2.10 The CIHT report also states that vehicle speeds should typically be very low, well below 20mph. Greater understanding of the functioning of shared space and the relationship between speed, traffic flows and pedestrian densities is probably required:
  - when a vehicle travels at 5mph through a busy shared space it has a very different effect to a vehicle travelling at 15mph

- when there is a high pedestrian density, 15mph vehicle speeds might not be appropriate, but in the same scheme at a quieter time, when there are less pedestrians present, 15mph might be appropriate.



*Castle Square, Caernarfon before and after the pedestrian priority scheme (2008)*



- 2.11 The number of variables that influence vehicle speeds in a shared space is large and reference to existing schemes has been found helpful in developing designs.
- 2.12 Some design elements introduced to shared space can sometimes appear to make a scheme safer but the reaction of motorists to that element might result in greater risk to pedestrians by encouraging faster or less sympathetic driver behaviour. Counter-intuitive effects are not uncommon due to over-compensation in driver behaviour.
- 2.13 One of the advantages of a flush surface is illustrated at Frodsham Street, Chester. In this scheme there is no kerb to restrict the movement of prams, wheelchairs and other mobility apparatus. The original narrow, kerbed footway (see before/after images) sometimes caused wheelchairs to tip or users to be trapped in the carriageway area until they could access a dropped kerb.
- 2.14 The Chester scheme (one-way traffic) used timber totems to guide drivers away from the pedestrian-only zone with the tactile paving kept to the edge of the space, to minimize the impression of an effective carriageway. The layout appears pedestrianised to drivers and pedestrians alike encouraging pedestrians to use the centre of the space, and drivers to respect pedestrians. Benches, located adjacent to vehicular movement paths, are used at key locations, particularly pinching the vehicular entrance to the space, to communicate to drivers the sense of a pedestrian priority space.



*Frodsham Street, Chester before (and overleaf after) the pedestrian priority scheme (2017)*



*Frodsham Street, Chester*

- 2.15 The Chester scheme highlighted the value of retaining: a linear clear zone between the building frontage; and tactile paving so that blind/partially sighted users do not regularly collide with street furniture, as they would on a traditional pavement. This, and an appropriate layout of tactile paving with a tonal-contrast, helped prompt a positive response to the scheme from local blind and partially-sighted users. In the absence of a defined standard for tactile paving in a flush surface pedestrian priority space this scheme uses a 400mm wide corduroy tactile to guide users along the clear, furniture free, route, this was terminated at side road crossings with 800mm of blister paving, a major cross route was also marked with 800mm of blister paving in-place of the corduroy.
- 2.16 The sole purpose of tactile paving is to aid blind and partially sighted users navigating streets and spaces whereas many pedestrian priority schemes use it as a substitute for a flush kerb to inform drivers where the effective carriageway is. The photos below are examples of schemes where the tactile paving is used, unhelpfully, in place of a flush kerb and where

tactile paving is cluttered with street furniture making it impossible for blind/partially sighted people to follow.



*Examples of inappropriate use of tactile paving where it conveys a carriageway line rather than directing blind/partially sighted people and where it is cluttered with street furniture and therefore impossible to follow.*

- 2.17 Blind and partially sighted users may request that signalized crossings being incorporated into pedestrian priority schemes. Designers have tended to avoid this as it increases the risk

that the highway infrastructure unintentionally implies a right of way for vehicles when a green light shows along with resulting increase of traffic speeds.

- 2.18 Cyclists would generally be expected to use pedestrian priority streets in a similar manner to a pedestrianised area and this form of design can be used to facilitate contraflow cycling without any of the usual confusing infrastructure. Some cyclists are seen to dismount in such areas, others ride with differing degrees of care. In a well-designed pedestrian priority scheme, cyclists do not feel they have a right of way over pedestrians.

#### Informal Streets

*Streets where there is a footway and separate carriageway but these are often separated by a low kerb.*

- 2.19 Some new junction and crossing arrangements have been developed that reduce the impression of a vehicular right of way, for instance: courtesy crossings instead of Zebras or signalized crossings; and roundels instead of signalized junctions or mini-roundabouts.
- 2.20 These informal features also provide designers with the opportunity to locate crossing points more freely as they are not subject to the design advice generally applied to traditional highway infrastructure which can result in crossing points being located away from desire lines. Sometimes a central medial is employed to help pedestrians cross.
- 2.21 Informal street techniques have been employed in exceptionally busy vehicular environments, in excess of 25,000 vehicles per day, such as Poynton in Cheshire, Frideswide Square in Oxford or Ashford in Kent and appear to efficiently manage the high volumes of vehicles by providing a free-flowing but slow moving environment.



*Frideswide Square, Oxford showing a roundel, courtesy crossing and central median with minimal formal highway infrastructure. The scheme includes three roundels which replaced a very busy and intrusive series of traffic lights.*

- 2.22 Blind and partially sighted campaign groups have particular concerns regarding:
- The absence of signalised crossings as this means that the users they represent do not know when it is safe to cross. Some designers have been reluctant to incorporate signalised or Zebra crossings for fear of reinforcing the sense of a vehicular right of way in the carriageway but this is a subject for debate.

- Low kerbs that are not easy for all long cane or guide dog users to detect making it difficult for users to navigate or find crossing points.
- 2.23 Generally, to date, Informal Street schemes have not incorporated cycle lanes. There is no reason why they should not. The slower vehicular speeds seen in a well-designed scheme, make it easier to cycle in the traffic. Informal Streets often employ narrow lanes to reduce average traffic speeds which can result in:
- vehicles squeezing past cyclists in an uncomfortable and potentially dangerous overtaking manoeuvre;
  - a lack of space for cyclists to under or over-take vehicles when traffic backs up.
- 2.24 Cyclists can combat the former of the previous points by taking a more central position in a lane but some cyclists will not feel confident doing this or be aware that it is legitimate for them to do so.

### Enhanced Streets

*“Streets where the public realm has been improved and restrictions on pedestrian movement (e.g., guardrail) have been removed but conventional traffic controls largely remain”*

- 2.25 These are fairly traditional streets but, as set out above, they might have pedestrian guard rails removed or signage decluttered. Designers might not recognise these as a shared space but blind and partially sighted campaign groups have described them as such so the terminology is used to help differentiate these from less traditional highway arrangements.
- 2.26 An early example of this was Kensington High Street where carriageway and footway are separated by a full 100mm or 120mm kerb.



*Kensington High Street, London*

- 2.27 Blind and partially sighted users can be concerned that the lack of pedestrian guard rails makes it difficult for them to find and navigate signalised crossings. There is though substantial evidence that removal of pedestrian guard rails dramatically reduces pedestrian casualties so any decision to retain or remove guard rail must be balanced. If they are removed, mitigation arrangements, utilising tactile paving, can be employed to direct the blind and partially sighted.

### 3 Clarification of the latest position of the Department for Transport on Shared Space

- 3.1 In this Note, the updates on the position of the Department for Transport are outlined and highlighted to help clarify a confused situation. (Note: It is possible that this position will change in the near future and the following analysis become out of date.)
- 3.2 The clarification from the DfT on the 28th September 2018 regarding a temporary moratorium on shared space states: *“the focus of the pause is on level-surface schemes in areas with relatively large amounts of pedestrian and vehicular movement, such as high streets and town centres (outside of pedestrian zones). The pause does not apply to streets within new residential areas, or the redesign of existing residential streets with very low levels of traffic, such as appropriately designed mews and culs-de-sac”*.
- 3.3 This clarification came after the DfT had taken a number of different positions during 2018 and still leaves a lot of room for interpretation. For instance, what constitutes a relatively large vehicle flow? Also, existing schemes that show these flush forms of shared space function better when there are ‘*relatively large amounts of pedestrians*’ using them, and less well when there are fewer pedestrian, because, at higher densities, pedestrians are able to dominate the space and drivers feel a greater sense of responsibility. The clarification also makes no mention of:
- vehicular speed: higher traffic speeds are arguably a greater risk to pedestrians than vehicle flow
  - the use of signalised pedestrian crossing facilities: their omission from schemes is arguably a much bigger issue to blind and partially sighted users than the flush surface
- 3.4 To put the September 2018 clarification in context, the following lists some other statements relating to shared space issued by the government over the previous year, highlighting the complexity of the issue and the range of opinions within government:
- November 2017: Women and Equalities Committee Report: advocates for moratorium on shared space;
  - January 2018: BS8300 Design of an accessible and inclusive built environment “The recommendations for street design do not include any advice on shared space/shared surfaces, as responses to the public consultation on this edition of BS 8300-1 indicate that the subject is controversial, and further *research is required before the subject can be covered in any detail in the standard.*”
  - March 2018: DfT response to the Women and Equalities Committee states that councils are responsible for the design of streets, they do not have to seek DfT permission. Decisions are for councils to make, this is the case for all streets, not just shared space (itself not clearly defined). Each site is different. Design is dependant on its individual characteristics, the features included and how they work in combination;
  - May 2018: Disabled Persons Transport Advisory Committee recommendations on Shared Space: advocates for moratorium on shared space;
  - July 2018: DfT Inclusive Transport Strategy: recommends pause on shared space; and
  - 28th September 2018: DfT clarification letter on the recommended pause on shared space design: *“the focus of the pause is on level-surface schemes in areas with relatively large amounts of pedestrian and vehicular movement”*
- 3.5 The DfT had published Local Transport Note 1/11 ‘Shared Space’ (LTN 1/11) but this was withdrawn in August 2018 whilst the DfT carry out further research following the Inclusive Transport Strategy recommendations.

## 4 Inclusive Design

- 4.1 The Landscape Institute has produced a Technical Guidance Note on Inclusive Design 03/2019 which, following the lead of BS8300: 2018 “Design for an accessible and inclusive built environment”, does not provide specific advice on inclusive design within Shared Space as it is a specialised subject area. This TIN highlights the key issues, benefits and provides some design examples relating to inclusive design.
- 4.2 The Equalities Act 2010 sets out our Equality Duty to:
- eliminate unlawful discrimination;
  - advance equality of opportunity; and
  - foster good relations.
- 4.3 The Equalities Act states “*Public bodies must publish information to show that they consciously thought about the three aims of the Equality Duty as part of the process of decision-making.*” and requires a ‘reasonable’ adjustment to ensure the equal provision of services. The definition of reasonable is on a case by case basis. You are discriminating against a disabled person if you “*cannot show that a treatment is a proportionate means of achieving a legitimate aim*” (Sections 15 and 19).
- 4.4 It would be normal to consult widely on any proposed shared space scheme in order to: understand issues; identify opportunities; and review options. This would usually involve blind and partially sighted groups as well as less well represented individuals, who might be impacted positively or negatively by the scheme, to help inform a balanced understanding.
- 4.5 Blind and partially sighted users have expressed concerns regarding how they safely navigate shared spaces and the bodies representing them have mounted a sustained campaign against shared space. Two of the main concerns are:
- How do they know where they are in a street or space without a kerb?
  - How can they safely cross the street without a signalized crossing when they can’t tell whether or not a car is coming? This is because many shared space proponents discourage the use of signalised crossings as traditional highway infrastructure increases vehicular speeds and drivers accelerate towards an amber or interpret the green light as indicating they have a right of way.
- 4.6 Concerns are also expressed with respect to children and people with neuro-diverse conditions or learning disabilities who might find it easier to understand a traditional street environment.
- 4.7 Those who promote shared space would counter that the low vehicle speeds that a well-designed shared space environment encourage result in a safer environment for all users, therefore complying with the Public Sector Equality Duty, and is more forgiving of mistakes that might be made by drivers and pedestrians including children, old people, the blind/partially sighted and those with neuro-diverse conditions or learning disabilities. Flush surfaces are also easier for people in wheelchairs or pushing prams to negotiate.
- 4.8 There are many poorly designed streetscapes, both shared space and traditional design, which do not create safe environments for pedestrians. Tactile paving is often very poorly detailed across all environments resulting in confusing or entirely absent guidance for blind and partially sighted users. The DfT “*Guidance on the use of Tactile Paving Surface*” is very

out of date though a consultation is underway on some updated guidance *“Interim changes to the Guidance on the use of Tactile Paving Surfaces, Department for Transport 2015”*.

- 4.9 The Disabled Persons Transport Advisory Group (DPTAC), Women and Equalities Committee (WEC) and the DfT’s Inclusive Mobility Strategy highlight the issues from the position of disabled users and all call for some form of moratorium on shared space influencing the DfT’s position as described in the previous section.
- 4.10 Lord Holmes, an ex-Paralympian, and peer who is blind has led much of the campaign against shared space along with the Royal National Institute for the Blind (RNIB), Guide Dogs for the Blind and the National Federation of the Blind UK (NFBUK).
- 4.11 Lord Holmes published a report on shared space in 2015 *“Accidents by Design”*, this interviews blind and partially sighted people about their experience of shared space reporting universal condemnation. This further emphasizes the problems faced by blind/partially sighted users though the report is not academically rigorous and was described by the Disabled Persons Transport Advisory Group as *“useful evidence, but perhaps lacks the objectivity of the Women and Equalities Commission report”*.
- 4.12 Some blind/partially sighted groups campaigning against shared space cite the Public Sector Equality Duty which they say *“instructs planning authorities that all streets and public areas must be accessible to everyone”*. This is not the case. DPTAC more accurately state *“Those involved in shared space schemes need to be cognisant of the need to comply with the Public Sector Equality Duty and the duty to implement reasonable adjustments”*.
- 4.13 There is evidence that local blind/partially sighted users, where some well-designed shared space schemes have been implemented, support these environments, finding them easier to navigate than the previous traditional environment. A better understanding of what makes these schemes work is needed to help inform designers.
- 4.14 Designers should engage proactively with disabled access groups when designing any streetscape scheme. Unfortunately, constructive dialogue is sometimes difficult as some proponents and opponents have established entrenched positions and there is much misinformation and propaganda to support their positions making it difficult for people to make informed, objective decisions. It would be helpful if people involved in future schemes were able to engage more constructively to deliver a better pedestrian environment for all users.
- 4.15 The issues highlighted by disabled users also have parallels with the experience of users engrossed in their mobile phones or wearing headphones and unable to hear traffic.

## **5 Hostile Vehicle Defence Solutions**

- 5.1 The issue of security, particularly from terror attacks, is sometime raised in relation to shared space as the kerb is either flush, or easier to mount than a conventional 100mm or 125mm vertical kerb.
- 5.2 Recent terror attacks in London, Barcelona and Nice all occurred on streets with a traditional full kerb, none have happened in a shared space environment. The kerb does little to deter an attack or stop a vehicle entering a pedestrian area.
- 5.3 Terror attacks can happen in streets with any form and the risk in shared space streets should be analysed to the same degree as in a traditional street.
- 5.4 This issue can result in pressure to design in security barriers (PAS 68 standard) such as bollards or other elements of street furniture to create a pedestrian only zone. The problem with this is that it can create a corridor effect: deterring pedestrians from using the whole space; and reinforcing perceived vehicular rights of way in the carriageway, resulting in: higher vehicular speeds; and a greater risk to pedestrians and cyclists throughout the operational life of the scheme.
- 5.5 Design techniques can be used to reduce the perception of an effective carriageway, perhaps substituting bollards for other elements of street furniture that are PAS 68 compliant but, due to the close spacing required to exclude a vehicle, it is not easy to avoid the increased risk of raising vehicle speeds. There is of course also a cost associated with these products.
- 5.6 A risk assessment could be carried out comparing the risk from a hostile vehicle to that from potential increased vehicular speeds, though there would be very little evidence to base such an assessment on.

## 6 The detailed design of Shared Space

### Surface material, detailing and structure

- 6.2 Shared spaces often employ non-black asphalt surfaces to help communicate to drivers and pedestrians that they are in a non-standard highway environment or for aesthetic reasons. Unfortunately there are lots of examples of poorly detailed shared space surfaces that have failed in multiple locations. Although this is generally the responsibility of an engineer or contractor who should be familiar with the specialist skills required to robustly design or build trafficked environments with non-asphalt materials, the Landscape Architect can help if they are aware of some of the issues.
- 6.3 Surfaces can be described as rigid or flexible. There is extensive advice in the thirteen different parts of BS7533 that set out the appropriate detailing of rigid and flexible surfaces suitable for the predicted traffic loadings. Surface detailing, base and sub-base design are the remit of engineers who should also detail the structural aspects of bedding, jointing, paving unit size, material and paving pattern. A Landscape Architect might reference BS7533 to inform their design and will have particular input to the surface finish.
- 6.4 Asphalt is described a 'flexible' surface as it deforms, very slightly, under loading. Stone sett or concrete block surfaces that are laid on, and jointed with, sand are also flexible surfaces. Mortar jointed and bedded setts or blocks create a rigid surface.
- 6.5 Based on traffic loading and ground conditions, an appropriately experienced engineer will advise on the detailing of the system that supports the surface. Generally a rigid surface is laid on a rigid base, such as concrete. Flexible surfaces are usually laid on a flexible base such as asphalt.
- 6.6 Rigid systems are able to take higher traffic loading than flexible systems which are cheaper and quicker to lay due to the longer curing time of concrete and mortar in a rigid system. Flexible systems are more readily laid onto existing road bases which are usually asphalt where as a system employing a rigid base may require removal of the existing base, disruption of services and additional cost.
- 6.7 Rigid systems often use resin mortars which are more consistent than cement mortars and can be stronger than the stone itself if full and consistent contact with the unit is achieved. Primers can be used to improve the adherence of the jointing or bedding mortar to the block. Some of these mortars might be applied in a liquid form such that they flow into joints with excess mortar washed off, there is a risk that if this is not done properly, or the surface of the paving unit is very rough, the mortar can dry and adhere to its surface creating an unsightly finish.
- 6.8 Sometimes, if failure of a rigid surface occurs, it can be because of the massive point load exerted by the power-assisted turning of an HGV or bus wheel being concentrated on an individual unit. Deep units can successfully resist this as the strength is derived from the area

of jointing and bedding mortar fixing the unit in place, an engineer can advise on the appropriate depth with reference to BS7533.

- 6.9 Larger paving units actually produce more resistance to failure from this turning motion than smaller units, due to the larger mortared surface area but smaller units are better at withstanding flexural loading and appear more commonly in schemes.
- 6.10 Paving bonds are not simply patterns but provide strength to the surfaces with Fan and Herringbone some of the stronger patterns whereas patterns where joints line up, such as Stack Bond, are weaker. Causes of failure might be associated with a break in the bond pattern, this can occur at:
- The edge of a paving area where it meets a different surface (see paragraph below)
  - Around access covers, gullies or linear drains: such ironmongery needs to be rigid enough such that it's flexing does not induce cracking in adjacent paving, and deep enough to accommodate the adjacent paving unit
  - Any linear feature such as a flush kerb
  - Changes in paving pattern
- 6.11 Where a rigid surface meets a flexible surface such as asphalt, often at the edge of a paving area, a line of weakness exists as the movement in the flexible system induces cracks in the rigid system since it is not providing a solid support. BS7533: Part 7 provides details for strengthening the haunching at such junctions with steel reinforcement bars.
- 6.12 Once cracking starts in a rigid system it can propagate as neighbouring blocks are no longer fully supported, this can result in the failure of a wider area.
- 6.13 Coloured asphalt and Resin Bound Gravel can be used as flexible surfaces but require a diligent maintenance regime to ensure that any post-completion works to services are properly repaired.



*Fan tail pattern being laid using a rigid system at Castle Square in Caernarfon, a rare use of Welsh Granite.*

### Street furniture in shared space

- 6.14 Street furniture can be used to guide vehicular movement across flush surfaces but it can also be used to indicate the character of a space, changing perceived rights of way. Benches may be a more effective way than signage to communicate how drivers should behave and they can be used as such i.e. not only located where people may want to sit, but also at gateway locations and regular intervals along a street as a reminder, whilst also providing more rest spots for those who need it. Artwork can also be used to change the character of a space such that it is seen as a public space, not a highway.
- 6.15 Street furniture is more vulnerable to vehicle impact in a Pedestrian Priority Space or Informal Street as there is not a full height kerb to protect it. Careful consideration to the detailing and location of furniture helps minimize this risk and more sensitive pieces such as lighting or artwork can be protected by less sensitive pieces such as bins and bollards. Low level street furniture is especially vulnerable to reversing vehicles.



*The Town Square in Accrington takes very limited traffic but accommodates large vehicles accessing a service yard between the Town Hall and Market Hall. The signage and bin are located to protect the expensive bench which incorporates interpretive artwork (n.b. the textured paving is not tactile paving).*

- 6.16 There is sometimes pressure to designate a shared space a 20mph zone. Where average speeds are above or approaching 20mph, this may be helpful, but where average speeds are significantly lower than 20mph, the signage might encourage drivers to think it is safe to drive at 20mph when designers are aiming for lower speeds.
- 6.17 Formal highway signage can be used to indicate to vehicles that they are entering a shared space but a design will be more successful if this message is communicated through the character of the space rather than signage. Poynton uses a prominent piece of artwork as well as formal signage. The artwork includes the text “Shared Space Village, Give Way to All”



*Poynton Gateway Artwork by Chris Brammall*

- 6.18 The quality of some shared space schemes has suffered from litter and road debris where the sweeping regime has not been taken into account in the design. The kerb in a traditional street provides an efficient means of collecting such detritus and a sweeper simply follows the kerb to clean the street, the kerb also prevents road debris from spreading across the footway. Particularly on a flush surface, there is nothing to contain or collect the debris and street furniture can create areas that are difficult to reach with a mechanized sweeper. Ensuring the spacing and layout accommodates sweeping machines used in the locality of the scheme can mitigate this issue.

## 7 List of relevant documents

Links are not provided to referenced document as these often change but the document should be accessible with a google search. British Standards might have to be purchased to view.

Link and Place, Peter Jones, University College London

Manual for Streets 2, Chartered Institute of Highways and Transportation

Local Transport Note 1/11 Shared space – currently withdrawn

Accidents by Design, the Holmes Report into Shared Space, Lord Holmes of Richmond MBE

Inclusive Mobility, DfT

Inclusive Transport Strategy, DfT

DfT Inclusive Transport Strategy

BS8300 (2018) Design of an accessible and inclusive built environment

Sight Line, Designing Better Streets for People with Low Vision (2010), by Ross Atkin, CABI, Helen Hamlyn Centre at the Royal College of Art

Guidance on the use of Tactile Paving Surfaces, DETR 1998

Interim changes to the Guidance on the use of Tactile Paving Surfaces, Department for Transport 2015

BS7533 Series - Pavements constructed with clay, natural stone or concrete pavers BS 7533 consists of the following parts:

- Part 1: Guide for the structural design of heavy duty pavements constructed of clay pavers or precast concrete paving blocks;
- Part 2: Guide for the structural design of lightly trafficked pavements constructed of clay pavers or precast concrete paving blocks;
- Part 3: Code of practice for laying precast concrete paving blocks and clay pavers for flexible pavements;
- Part 4: Code of practice for the construction of pavements of precast concrete flags or natural stone slabs;
- Part 6: Code of practice for laying natural stone, precast concrete and clay kerb units;
- Part 7: Code of practice for the construction of pavements of natural stone paving units and cobbles, and rigid construction with concrete block paving;
- Part 8: Guide for the structural design of lightly trafficked pavements of precast concrete flags and natural stone flags;
- Part 9: Code of practice for the construction of rigid pavements of clay pavers;
- Part 10: Guide for the structural design of trafficked pavements constructed of natural stone setts and bound construction with concrete paving blocks;
- Part 11: Code of practice for the opening, maintenance and reinstatement of pavements of concrete, clay and natural stone;
- Part 12: Guide to the structural design of trafficked pavements constructed on a bound base using concrete paving flags and natural stone slabs;
- Part 13: Guide for the design of permeable pavements constructed with concrete paving blocks and flags, natural stone slabs and setts and clay pavers.

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