2.4 Street design principles

Early 'Street Types' work proposed six key roles which streets and roads need to fulfil including moving, living, unlocking, functioning, protecting, and sustaining (www.tfl.gov.uk/cdn/static/cms/documents/rtf-report-chapter-1.pdf). Below, each role is described. From these six roles, key design principles have been extracted which define the aspirations of this guidance. These symbols will appear alongside case studies, vignettes and trials to denote how these interventions are working to achieve the aspirations of 'Street Types':

'Moving'

Help people, goods and services get from A to B, by enabling more efficient and reliable movement for a range of transport modes.

a) Facilitate an increase in walking and cycling – ensure that walking and cycling are the most competitive transport modes for short and medium length journeys. This can be achieved through an enhanced public realm, safer, more convenient crossings and prioritising pedestrian movements in key locations.

b) Balance user priorities – explore techniques that prioritise particular road users and communicate with the use of surfacing and material layouts.

c) Manage traffic speeds – ensure that vehicle speeds are appropriate for the surroundings, and reinforced through the street layout, scale and type of materials used.

'Living'

Provide welcoming and inclusive places which support economic, cultural and community activities.

a) Implement contextually sensitive design – streetscape design must respect the character of the place through which the TLRN passes, not only the physical attributes of landscape and townscape, but also the activity, vitality and distinctiveness of the local community.

b) Apply inclusive design principles – people of all abilities should be able to access different modes of transport and conveniently change between them. People should be able to comfortably move along footways unhindered by street clutter, poor quality materials or inappropriately located obstacles.

c) Facilitate social interaction – opportunities should be taken to encourage people to interact socially on the street and support stationary activities where appropriate.

d) Improve journey experience – ensure a high quality streetscape that makes the best use of the space available through rationalisation of street furniture and utilities, and through the use of high quality materials.

'Unlocking'

Improve the accessibility, connectivity and quality of major growth areas to support the delivery of new homes, jobs and economic sectors that London needs as it grows.

a) Reduce severance – the provision of safe and convenient crossings between neighbourhoods divided by infrastructure should be prioritised.

b) Foster regeneration – recognise the impact that streetscape improvements may have on public and private interests. Public realm improvements can act as a catalyst for further regeneration.

'Functioning'

Ensure essential access for deliveries and servicing, and upgrade utilities to better serve London's growing needs and foster a digital city.

a) Fit for purpose – products must be robust, durable, and fulfil their designed lifespan, wearing well over time.

b) Adaptable – select materials and products that are flexible to change, such as street light columns that can be adapted to take signs, signals and banners.

c) Convenient to maintain – new products should accord with current maintenance regimes and all existing assets brought up to a good state of repair.

d) Timeless – materials and designs must embody a simple and consistent approach to ensure that the street does not look dated quickly.

e) Seamless – avoid abrupt changes in paving and street furniture materials and patterns where possible and work to provide seamless integration of materials across administrative boundaries.

f) Simplicity – minimise the variety of materials; use intuitive solutions and declutter.

g) Improve legibility – streets need to be easy to understand and move through. This can be achieved through the consistent use of materials, good wayfinding signage, and a logical approach to street design.

'Protecting'

Improve safety and ensure that streets are secure.

a) Create safer streets –slowing traffic speeds where appropriate, maintaining good visibility and reducing the likelihood of collisions.

b) Improve the perception of personal security – design and manage our streets to actively reduce crime and the fear of crime.

c) Reduce crime and disorder – design teams have a duty to ensure that highway schemes provide a safe and secure environment and do not create opportunities for crime. This is especially important for pedestrian and cycling only routes.

'Sustaining'

Reduce road network emissions and support clean, green initiatives for a healthier and more active city.

a) Resilient design – mitigate the impact of current and future climatic conditions by assessing, managing and minimising risk through good design. Plant trees and integrate sustainable urban drainage systems to better accommodate surface water runoff.

b) Invest in modal change – support sustainable transport modes with greater capacity for cycling and higher quality public realm to enable walking.

c) Low carbon materials – priority should be given to materials that support local economies and reduce negative environmental impacts.

2.5 Healthy Streets for London

TfL is embedding a new Healthy Streets Approach, and putting in place policies and strategies to help Londoners use cars less and walk, cycle and use public transport more. You can take a look at this approach here: http://content.tfl.gov.uk/healthystreets-for-london.pdf and find more detailed information about walking here: https://content.tfl.gov.uk/the-planning-for-walking-toolkit.pdf

Because 80 per cent of London's journeys happen on our streets – including bus and tram trips and journeys to and from Tube and rail stations – we can only do this by creating streets that feel pleasant, safe and attractive, where noise, air pollution, accessibility and lack of seating and shelter are not barriers that prevent people – particularly our most vulnerable people – from getting out and about.

The purpose of the Healthy Streets Approach is not to provide an idealised vision for a model street. It is a long-term plan for improving Londoners' and visitors' experiences of our streets, helping everyone to be more active and enjoy the health benefits of being on our streets.

To deliver the Healthy Streets Approach, changes are required at three main levels of policy making and delivery:

1) Street level 2) Network level

3) Strategic level policy and planning

Work at every level aims to improve the experience of travelling through and spending time on London's streets and is judged on the ten Healthy Streets Indicators. The Healthy Streets Approach uses ten evidence-based indicators of what makes streets attractive and appealing places. Working towards these will help to create a healthier city, in which all people are included and can live well, and where inequalities are reduced.

Figure 15: Indicators of a healthy street environment

2.6. Delivering value

TfL is committed to ensuring that public money is invested to maintain and enhance London's transport network and provide the greatest benefits to all of society in the most efficient way. It is therefore vital that all investment decisions are based on clear and robust analysis of value for money.

TfL defines value for money as the optimal use of resources to achieve the intended outcomes. This focuses on spending less, spending well, spending wisely and spending fairly.

We adopt the following principles in practice as developed by National Audit Office (NAO) which consist of four main elements:

(a) Economy: minimising the cost of resources used or required (inputs) spending less;

(b) Efficiency: the relationship between the output from goods or services and the resources to produce them – spending well;

(c) Effectiveness: the relationship between the intended and actual results of public spending (outcomes) – spending wisely; and

(d) Equity: the extent to which services are available to and reach all people that they are intended to – spending fairly. Some people may receive differing levels of service for reasons other than differences in their levels of need.

TfL and the Borough's investment programmes should aim to deliver the optimal combination of whole-life cost, safety, reliability, effective commercial management, customer perception, mandatory standards and environmental impact in a sustainable way to meet requirements within the bounds of financial constraints.

The capability to realise value from any investment starts with *selecting the right things to do for the right reasons, then completing this work effectively and efficiently*.

Part B From strategy to delivery

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3.1 Bringing it all together

It is not always necessary to undertake wholesale redesign of a space when simple, light-touch measures may be all that is needed to make a place more functional and attractive. Understanding the context, purpose and demands placed on the space helps us understand how best to deliver the right type and scale of intervention.

It is essential that good public realm and street design provides for a myriad of social and economic needs, in addition to responding to the characteristic and functional diversity of different places and the vital movement function that the road performs.

The Better Streets agenda advocates a considered and staged approach to tackling these intrinsic differences in function, performance and urban form. This guidance asks designers to consider some fundamental guiding principles of design before presenting a staged approach which recommends five levels of intervention with increasing levels of complexity and cost to improving the public realm:

- **Tidy up** – look to remove unnecessary road markings or broken furniture which is simple to clear up and will not damage the footway

Figure 16: Better Streets Delivered provides examples of what has been achieved across London

- **De-clutter** – requires a more strategic justification for every individual piece of equipment in the street, with the presumption of removal unless a clear reason for retention is given
- **Relocate or merge functions** – any remaining features should be rationalised to combine signage and lighting or better locate street furniture to fulfil its intended use
- **Rethink traffic management options** – by considering user priority, changes to carriageway widths, or removal of traffic signals
- **Recreate the street** – complete remodelling of the street may be suitable if a new set of objectives or character is desired, for example, by creating a shared surface. This approach is not suitable in all locations and requires extensive consultation

Streetscape Guidance brings together many of the physical elements commonly found on London's streets. By consolidating various elements in a rationalised, clear and well-executed composition we can determine how well a street performs its function and serves the people who use it.

This guidance emphasises the importance of creating vibrant and inviting public spaces that promote the principles of Better Streets. This section investigates some of the recently completed schemes in London that have successfully transformed place and user experience through a range of techniques and creative vision.

Additional information

Better Streets Delivered: Learning from completed schemes (2013) http://content.tfl.gov.uk/better-streets-delivered-web-version.pdf

Better Streets Delivered 2: http://content.tfl.gov.uk/better-streets-delivered-2.pdf

3.2 A bold new approach

Exhibition Road

Royal Borough of Kensington and Chelsea
SW7

Completion date: December 2011
Cost: £29m

Improvements

- Recreate the street
- Rethink traffic management
- Relocate/merge functions
- De-clutter
- Tidy up

Exhibition Road, which runs south from Hyde Park to South Kensington, is home to some of the top educational and cultural institutions in London, including the Victoria and Albert Museum, Natural History Museum, Science Museum, Royal Geographical Society and Imperial College London. Until recently, Exhibition Road had a poor urban environment dominated by vehicular traffic and narrow footways, frequently blocked by parked coaches, cars and street clutter. With more than 11 million visitors a year, this unwelcoming pedestrian environment often led to overcrowding with people spilling out on to the busy carriageway.

Figure 17: The redeveloped Exhibition Road creates a more pleasant environment for those living, working and visiting the area

The transformation of Exhibition Road into one of the finest streetscapes in London required extensive public and stakeholder consultation to ensure all users were able to access the space, that the design responded appropriately to the historical context of the street, and the needs of local residents and institutions were met. As the layout of the street is unique, without traditional methods defining the footway and carriageway, concerns raised for visually impaired people were met with rigorous testing of tactile delineation and monitoring for two years following completion.

The Royal Borough of Kensington and Chelsea, in partnership with English Heritage, Exhibition Road Cultural Group, City of Westminster and TfL worked to convert a busy and unappealing traffic-dominated road into an elegant pedestrian boulevard, setting new standards for urban design. The bold design features a kerb-free surface with tactile materials to distinguish boundaries between pedestrian and vehicular areas, a reduction in speed limits to 20mph, and the removal of street clutter and gyratory system around South Kensington station. The result is one of the most recognisable cultural destinations in the world.

Before

1. Street furniture obstructs narrow footway
2. Car parking impedes crossings
3. Road markings create visual clutter
4. Material choice and design creates poor setting for historic buildings

After

1. Granite paving setts applied in bold pattern across entire area to create shared surface
2. Drainage channel, corduroy paving and bollards define shared space
3. Inspection covers seamlessly integrate with paving
4. Art, seating and car parking provided in street furniture zone
5. Street furniture and equipment use consistent colours

3.3 Enhancing a cultural heart

Leicester Square

City of Westminster
WC2H
Completion date: 2012
Cost: £15.3m

Improvements

- Recreate the street
- Rethink traffic management
- Relocate/merge functions
- De-clutter
- Tidy up

Prior to the works, the urban environs of Leicester Square no longer mirrored its international landmark status. Shabby with neglect, the space struggled to encourage the 250,000 people who pass through the square every day to linger in the area. At the physical heart of London's West End, it functions as a beacon for entertainment and a destination in its own right with bars, clubs, cafés, restaurants and hotels. As the home of UK cinema and a flagship red carpet destination, the square also hosts major film premieres. To sustain this reputation, Westminster City Council committed to transforming Leicester Square. Westminster ran a design competition in 2007, with Burns + Nice ultimately being awarded the contract.

Figure 18: The high quality public realm at Leicester Square now sits comfortably within its surrounding street network, reinforcing the identity of this internationally important space at the heart of London's West End

During the development stages, there was significant involvement with local businesses and representative groups. This was followed up with weekly public drop-in briefing sessions, monthly meetings with key groups, a website detailing the planned works, and information displayed on construction hoarding – all coordinated through a dedicated communications officer.

The redesign of Leicester Square into a must-see destination presented an opportunity to consider the gardens, the square and the connector streets as one entity and create a coherent public realm that strengthens the identity of this part of the West End. Around the perimeter of the gardens, a curvilinear seating wall and shrub planting now extends the experience of the green square beyond its boundaries, while new lighting incorporated into the seating wall deters antisocial behaviour and makes the square more appealing after dark.

The identity of the square is highlighted with dark granite, while the primary movement corridors adopt a lighter shade. The existing 19th century Shakespeare fountain was retained and features water jets around the statue. Along the building lines a consistent alignment of alfresco dining areas now appear, reinforced with consistent edge treatments which again feature in the railings around the square. Legible London signage has been provided at key decision points. Vehicular access for loading is severely limited to times of day with the least visitors.

The square's makeover was completed in time for the Queen's Diamond Jubilee and the London 2012 Olympic and Paralympic Games. These revitalisation works have breathed new life into London's West End, attracting a number of new businesses to the square by providing a flexible and contemporary space that works well for everyday use and for large red carpet functions.

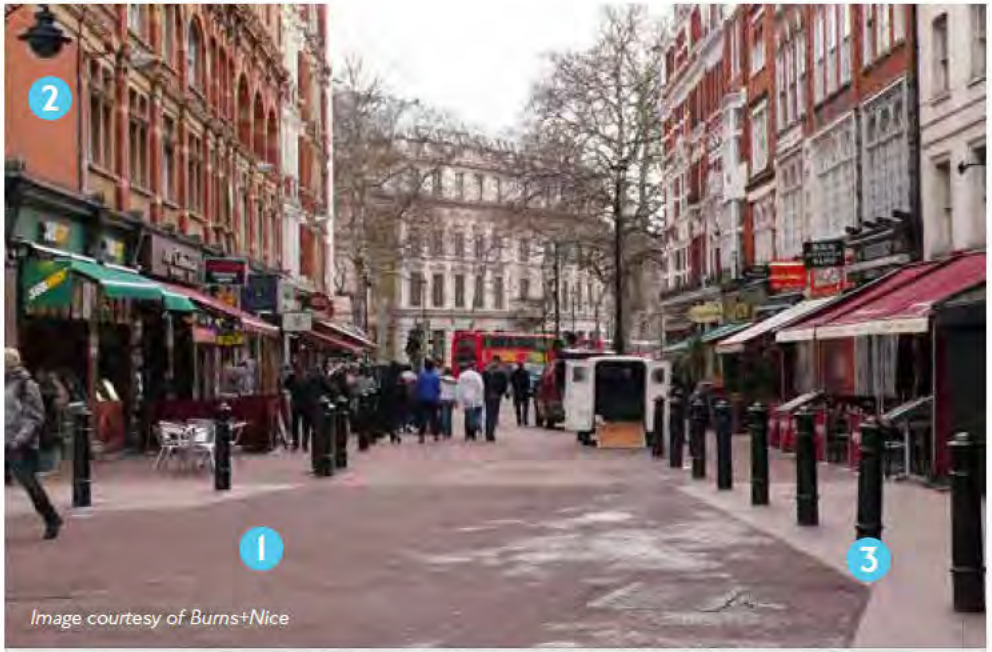


Image courtesy of Burns+Nice

Before

1. Multiple paving treatments create visual clutter
2. Paving tones conflict with architecture
3. Bollards restrict footways

Image courtesy of Burns+Nice

After

1. Simple light grey granite paving provides simplified backdrop
2. Café planters tie laneways to railings in the main square
3. Utility covers consistently paved

3.4 Changing the purpose of the street

Braham Street Park

London Borough of Tower Hamlets
E1
Completion date: February 2010
Cost: £2m

Improvements

- Recreate the space
- Rethink traffic management
- Relocate/merge functions
- De-clutter
- Tidy up

Braham Street Park was the first project completed under the High Street 2012 programme to improve links between the Olympic Park and the rest of London. This scheme was also part of a wider transformation of the Aldgate gyratory into a two-way system.

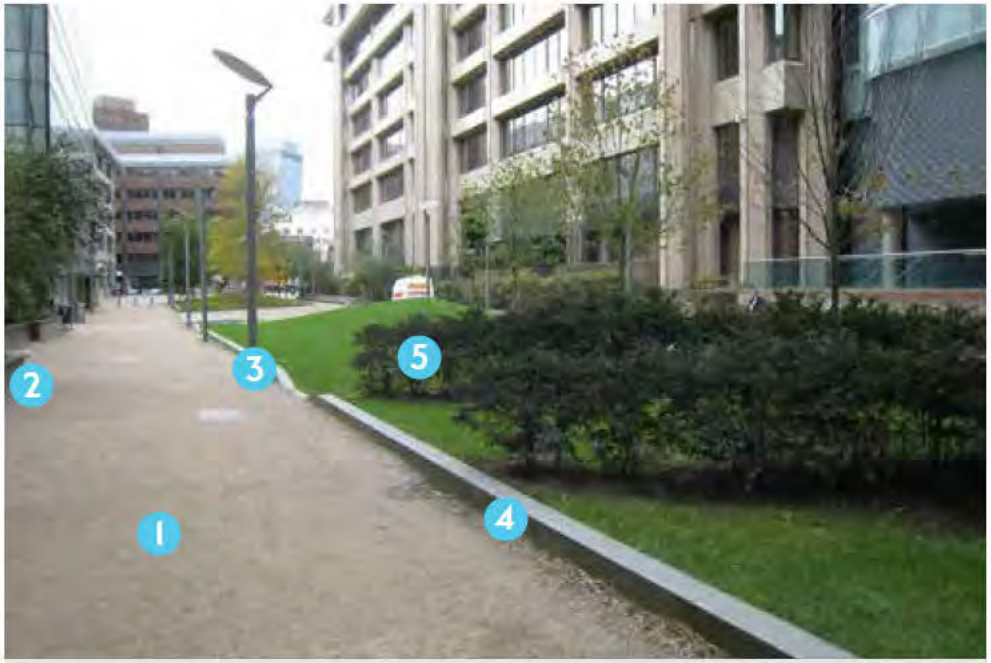
The redirection of four lanes of traffic by reverting Whitechapel High Street back to a two-way street, freed up road space owned by TfL for the development of new offices. Through a public-private partnership between the developer Tishman Speyer and ourselves, a much-needed open public space was created transforming an unfriendly busy street into an oasis of green.

Figure 19: The closure of a former one-way street has allowed for the creation of a large, fully accessible linear park in a busy area at the edge of the City of London

This long narrow park features many of the wishes expressed through extensive public consultation, including accessibility for all, with large expanses of greenery achieved through the use of sloping grass mounds. A simple palette of surface materials included asphalt paving, gravel and granite kerbs. The areas of planting combine grass, hedges, shrubs and trees which contrast nicely with light grey lighting columns and light grey granite kerbs. As the site prioritises children's play, it also features a waterfall and Europe's longest bench.

Before

1. Pedestrian movement restricted by guardrail
2. Inconsistent street furniture colours
3. Streetscape provided poor setting for commercial buildings



After

1. Loose aggregate allows water to infiltrate
2. Bespoke timber seating incorporating planters
3. Lighting column colour provides consistency with colour of kerb, bench and trees
4. Granite kerb used as dwarf wall
5. Low planting provides clear views of area

3.5 Rebalancing user needs

Angel town centre – Upper Street

London Borough of Islington
N1
Completion date: June 2012
Cost: £2.2m

Improvements

Recreate the space	☐
Rethink traffic management	☐
Relocate/merge functions	■
De-clutter	■
Tidy up	■

The initial aim of this scheme was to improve the ease of running buses through Angel town centre. However, the scope of the project quickly expanded to include bus reliability, improved conditions for cyclists and pedestrians, measures to smooth traffic flows, public realm improvements, and improved conditions for local businesses.

Early proposals included the widening of footpaths and the removal of one southbound lane between Islington Green and Duncan Street. TRANSYT modelling suggested that the scheme would be capacity neutral, however, consultation revealed intense speculation that the proposed road layout would worsen congestion in the area. Pedestrian crossings were widened as a result of the consultation.

Figure 20: A series of interventions at Angel town centre has led to a more user friendly street with increased space allowance for pedestrian movement and a negligible impact on vehicle capacity

Creating more 'people friendly' streets with improved facilities for pedestrians was a key focus of this project. A programme of decluttering was undertaken which included the removal of guardrails from the centre median and along footpaths. A key crossing serving Angel Tube station was relocated to the north side of Liverpool Road junction and rephased so that crossings could be made in a single stage. A staggered crossing was also added at the junction of Essex Road. Where existing tree plantings used a raised edge, these were lowered to be flush with the footway to increase the available width for pedestrians.

To create a consistent public realm with visual appeal, Yorkstone paving was laid throughout the scheme. A band of setts was used on the edge of the footway to visually reinforce the edge and prevent cracking of paving should a vehicle mount the kerb. The wide central median was extended along the length of Upper Street and guardrails removed to accommodate more informal crossings.

The needs of local businesses were also better served with three new inset loading bays added to the east side of Upper Street. These were paved in setts to match the surrounding footway and therefore functioned as part of the footway when not being used for deliveries.

To help traffic flow and increase the accessibility of the bus stops on Upper Street, the kerbs in the waiting area were moved. The southbound bus lane was also widened to better accommodate cyclists and motorcyclists.

Prior to these improvements, movement in Angel was tightly controlled and was subject to speeds not suitable to its context. Since the improvements, Angel town centre is better able to safely and efficiently serve businesses, pedestrians, buses, cyclists and other traffic.

Before

1. Pedestrian movement restricted by guardrail
2. Central island guardrail restricts pedestrian movement and creates a hazard for those that choose to cross informally
3. Inconsistent and damaged paving
4. Inspection covers with poor finish
5. On-carriageway loading bay restricts vehicular movement when in use

After

1. Grade change incorporated as a landscape feature increasing usable space
2. Carriageway islands paved in Yorkstone provides safe refuge for informal crossings
3. Consistent Yorkstone paving provides high quality footways
4. Corduroy paving denotes grade change
5. Street furniture, equipment and plantings are arranged in two furniture zones

3.6. Reversing a gyratory

Piccadilly Two Way

City of Westminster W1J, SW1Y and SW1A

Completion date: Phase 1 completed June 2012

Cost: £12.5m

Improvements

Recreate the space	☐
Rethink traffic management	■
Relocate/merge functions	■
De-clutter	■
Tidy up	■

The road network from Piccadilly Circus to St James's Street junction, and through to Pall Mall/ Waterloo Place, was changed into a one-way gyratory system in the 1960s to optimise traffic flows in London. A by-product of this one-way gyratory was streets dominated by traffic and an unpleasant pedestrian environment.

Besides the reversal of a one-way working system back to a two-way system, a major achievement of this project has been the partnership formed between TfL, Westminster City Council and The Crown Estate. The team worked collaboratively to undertake the modelling and design rather than TfL assessing

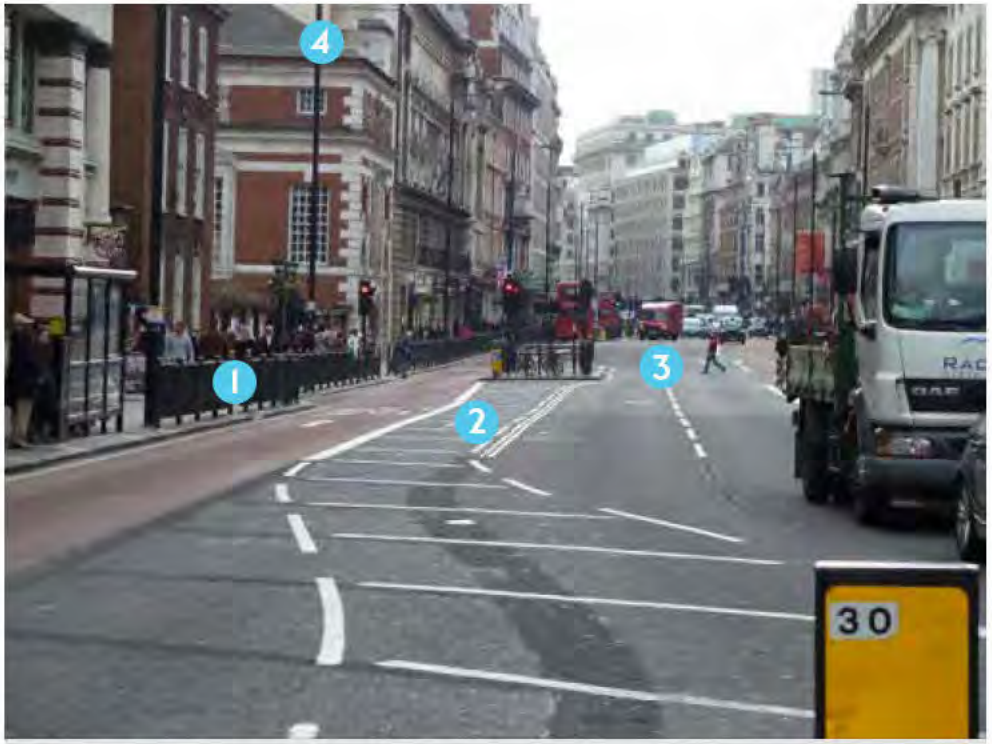
Figure 21: Streetscape enhancement has improved the historical setting of Piccadilly and provided greater space to accommodate the high level of pedestrian movement on the street

a borough-led scheme. Three critical areas were identified by the team: Piccadilly Circus, Piccadilly/St James's Street junction and Pall Mall/ Waterloo Place. Each area required careful design and testing to balance and maintain efficient traffic flows and bus service reliability in an area of very high footfall, while simplifying crossings and creating additional public space in this architecturally and historically significant part of the Capital.

The scheme reintroduced a two-way traffic system to the road network, as well as significant improvements to the public realm. The scheme has responded to the high footfall levels by widening the footways on highly trafficked walking routes. Informal pedestrian crossings have been encouraged through the use of a wide central median paved in light grey granite setts and the removal of one kilometre of guardrailing. Pedestrian crossings have been improved with the use of single stage phasing and widened crossing points.

Street lighting previously placed on either side of the street was rationalised and included along the central medi an. Signals were combined with lighting and road markings were minimised where practical. To reflect the area's cultural and historic significance, heritage-style lighting, Yorkstone slabs, granite setts and kerbs were used.

The resulting street provides a quiet composition that allows the rhythm and beauty of the buildings to stand out. Movement for all modes has become less congested, safer and more enjoyable.



Before

1. Guardrails restrict pedestrian movement and add visual clutter
2. Road markings create visual clutter
3. Pedestrian crossings are narrow and infrequent
4. Lighting columns on both sides of street further restrict narrow footways

After

1. Wide central median paved in similar footway material encourages informal crossings
2. Minimal use of road markings
3. Footways are paved in Yorkstone slabs
4. Street furniture placed in single zone against carriageway
5. Central street lighting reduces clutter

3.7 Simplifying a junction

Herne Hill

London Borough of Lambeth
SE24
Completion date: July 2010
Cost: £1.7m

Improvements

Recreate the space	
Rethink traffic management	■
Relocate/merge functions	■
De-clutter	■
Tidy up	■

Figure 22: Strong relationships and flexibility throughout the design process has led to a multifaceted and vibrant space which is actively used by the local community and provides a distinct sense of arrival at Herne Hill

The Herne Hill junction was identified as an overly complex arrangement with the intersection of six major roads causing significant traffic congestion. Initially, the scheme was a bus priority project to review bus lanes and signal timings, improve interchange links, and reduce bus delays by simplifying the junction.

The borough conducted extensive community engagement and set up a project board to help guide the process. As the brief developed, the focus shifted towards an all-encompassing town centre strategy. This included looking at walking and cycling facilities, opportunities for improved crossings and better access to Brockwell Park.

Policy 67 of the Unitary Development Plan (UDP) permitted 1,070 square metres of Brockwell Park to be used for a raised slip road between Norwood and Dulwich Roads, improving vehicular flow and safety for cyclists and pedestrians. This also allowed for a new, more open entrance to the park.

A major component of the design involved the closure of through traffic to Herne Hill station on Railton Road. A raised table outside the station and shared surfaces constructed of Yorkstone created a high quality pedestrianised environment.

On Milkwood Road, a raised zebra crossing and widened footway was introduced and staggered signalised crossings installed on Half Moon Lane. Junctions have also been tightened throughout the scheme to maximise footway space.

A strong project brief, coupled with political support from a project board, the local community and a flexible in-house design team, enabled the design of a more vibrant and multifaceted end product than originally planned. Simplifying the junction by closing Railton Road was the key component for justifying further interventions, with the pedestrianised area acting as an effective gateway to the scheme from the station.

Before

1. Pedestrian guardrail provides visual and physical barrier
2. Asphalt road surface in poor condition
3. Pedestrian realm poorly defined
4. Street furniture and equipment causes clutter and uses inconsistent colours

After

1. Pedestrian realm consistently defined with Yorkstone paving
2. Clear views to Brockwell Park enhanced
3. Granite kerbs provide a high quality finish
4. New tree planting

3.8 Making the most of constrained space

Kingsland High Street

London Borough of Hackney
E8

Completion date: April 2012
Cost: £2.58m

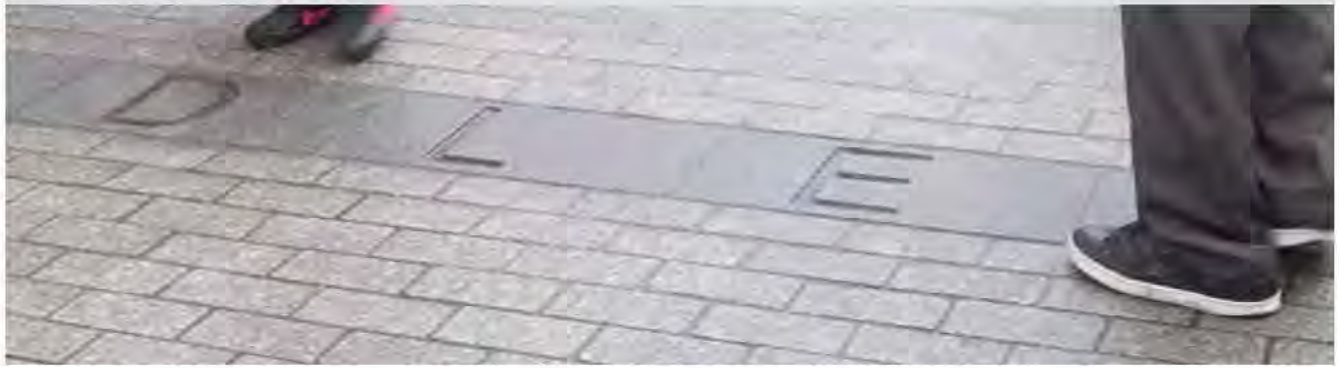
Improvements

Recreate the space	☐
Rethink traffic management	■
Relocate/merge functions	■
De-clutter	■
Tidy up	■

Kingsland High Street is a bustling local centre in Dalston, east London, that experiences high footfall and traffic at all hours of the day. Prior to the improvements, the corridor suffered from a poor safety record largely as a result of narrow footways and high levels of pedestrians, with some forced to walk on the road due to congestion and inadequate footway widths. It was anticipated that following the completion of Dalston Junction station this situation would only worsen as passengers interchange between Overground stations and buses.

Coupled with the obvious transit-related need to improve Kingsland High Street, the London Borough of Hackney recognised the area was rundown and identified Dalston town centre as a regeneration area. Streetscape improvements were seen as the starting point for supporting regeneration aspirations to better support local communities and businesses, and encourage further investment and growth.

Figure 23: Bespoke detailing elements and treatment can help to enhance the sense of place and reinforce the identity of a street



Following consultation with various parties including the police, the major objectives of the scheme were updated to include:

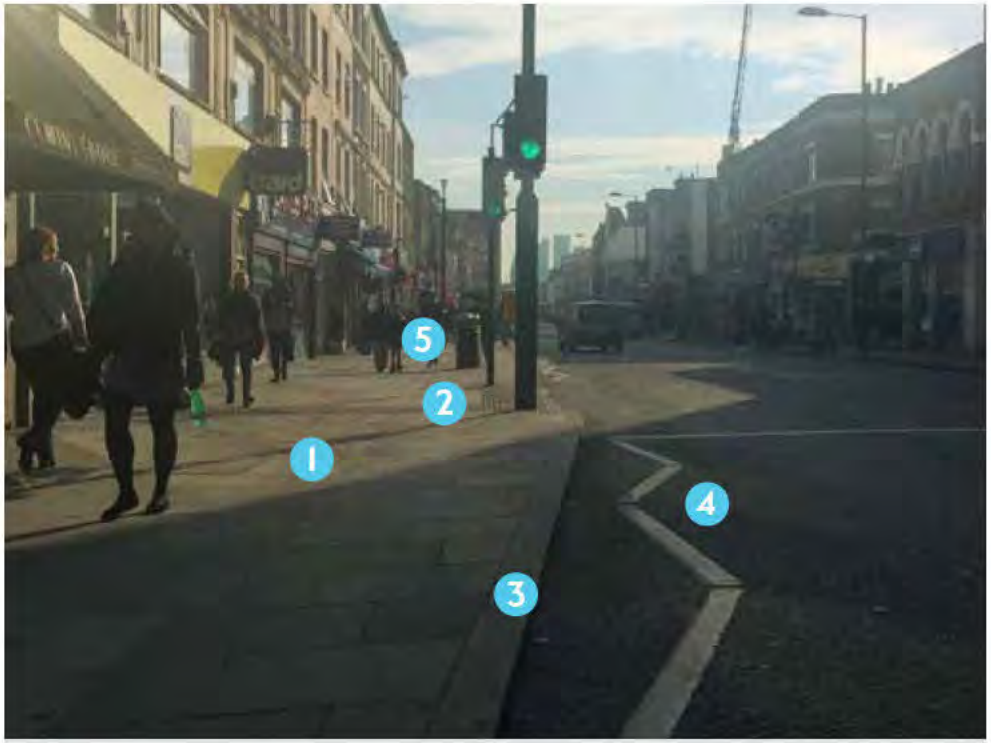
- Making Dalston a more walkable, attractive and thriving town centre
- Providing a more integrated streetscene and transport interchange
- Reducing levels of congestion and increasing levels of public transport use, cycling and walking
- Improving access to jobs, facilities and businesses
- Improving safety and security for residents and businesses

To simulate the effects of the scheme, which proposed a narrowed carriageway, a six-week trial was run. Temporary barriers were used to demonstrate that despite the reduction in overall capacity, congestion levels and bus travel times were not worsened.

This shift towards pedestrian priority is reflected in the new streetscape design which incorporates widened, decluttered and improved footways in Yorkstone and highlighted crossings. The transport interchange was highlighted with a bespoke treatment on the carriageway and relocation of bus stops. Businesses are better served with loading bays on the footway in granite setts. Wide kerbs were used to reinforce footway zones and bespoke paving was used to highlight special areas and enhance wayfinding. Lighting columns and lanterns were updated to LED. Despite the reduced carriageway capacity, traffic signals have been optimised to ensure that bus travel times are maintained and vehicle congestion minimised.

Before

1. Existing paving in poor condition
2. Signage and guardrails cluttering an already narrow footway
3. Crossings are infrequent causing pedestrians to cross informally



After

1. Consistent high quality footway paved in Yorkstone
2. Utility covers paved in Yorkstone provide unified footway
3. Wide granite kerbs provide elegant detail to pedestrian realm
4. Road markings rationalised
5. Street furniture and equipment have been decluttered and aligned in one furniture zone

3.9 Facilitating local businesses

Venn Street

London Borough of Lambeth
SW4

Completion date: September 2011
Cost: £0.46m

Improvements

- Recreate the space
- Rethink traffic management
- Relocate/merge functions
- De-clutter
- Tidy up

Monthly markets were introduced to Venn Street in 2001. Since then the popularity of the market has grown and Lambeth Council was asked to investigate how a weekly market could be introduced. The ambition for better market infrastructure quickly developed into a wider vision for wholesale streetscape improvements.

Prior to the improvements, Venn Street was dominated by vehicles and the footways were narrow and cluttered with equipment, limiting the street's social and commercial potential. A key challenge was that part of Venn Street was on the TLRN, however, in 2011 the Mayor of London returned this section of road back to Lambeth.

Figure 24: Engagement with local businesses and an innovative maintenance and funding regime has transformed Venn Street into a multifunctional space where businesses can benefit through the use of wide footway areas

Image courtesy of Ian Hingley, Urban Movement

The streetscape improvements have seen a new central paved area introduced using Yorkstone to create a level surface across the street. Recycled granite cobbles adjacent to this area demarcate the road and provide on-street car parking bays at either end. The shared surface approach helps to emphasise the 'villagey' Victorian character and enhances the quality of usable space for local businesses.

No road markings are painted on the street as it was granted a Restricted Zone by the Department for Transport (DfT) which has improved the aesthetic of the area. The design also includes building-mounted street lighting to reduce street clutter and electrical power points have been provided for market stalls.

The scheme has provided an economic boost for local businesses, as well as reducing council costs through a bespoke maintenance agreement. This has enabled businesses to take greater management responsibility for the street, which includes the funding of a regular jet wash. The bars and restaurants rent footway space and this money is invested in street cleaning and maintenance costs. Feedback from local residents and businesses has been positive, leading to calls for similar maintenance initiatives elsewhere.

Before

1. Streetscape dominated by car parking
2. Footways are narrow and cluttered

After

1. Yorkstone paving and granite kerbs provide defined spaces
2. Café seating, cycle parking and feature planting located in distinct zones
3. Key views are maintained

3.10 Good ordinary

Ambleside Avenue

London Borough of Lambeth
SW16

Completion date: November 2010
Cost: ±£1m (£60-£70 per sq m)

Improvements

Recreate the space	☐
Rethink traffic management	☐
Relocate/merge functions	☐
De-clutter	☐
Tidy up	■

Ambleside Avenue is part of a one-way system linking Tooting Bec Green with Streatham High Road. It is flanked by attractive Edwardian houses; however, its streetscape had deteriorated and by 2010 was in a poor state.

As part of our commitment to streetscape improvement, we elected to carry out a full reconstruction, including complete re-kerbing and resurfacing as part of our capital renewal programme. Wide granite kerbs provide a clear edge between the footway and the carriageway; both were then surfaced in asphalt. New trees have been planted and skilfully integrated into the footway with attractive granite setts.

Figure 25: Ambleside Avenue was fully reconstructed

Amblesde Avenue is an excellent example of the 'good ordinary', where consistent and well-detailed application of our Streetscape Guidance can provide a significant enhancement in the quality of public open space, based solely on the use of standard components. Asphalt footway surfacing can be perfectly attractive if well implemented and framed by high-quality kerbstones. A similar scheme is currently underway over a long stretch of Edgware Road.

Before

1. Regular kerbs poorly define footway
2. Trees not defined with paving
3. Asphalt is scarred by repairs

After

1. Footway surfaced in asphalt
2. Wide granite kerbstone defines footway
3. Build-out protects car parking
4. Wide granite kerb used as channel for drainage
5. Granite setts used to define edge of tree pit

3.11 Accommodating all users

Royal College Street

London Borough of Camden
NW1
Completion date: August 2013
Cost: £0.37m

Improvements

Recreate the space	☐
Rethink traffic management	■
Relocate/merge functions	■
De-clutter	■
Tidy up	■

Royal College Street had a reputation for road accidents involving cyclists. Despite a 20mph speed limit, vehicles were averaging 30mph which made collisions more serious in nature. In the three years prior to the improvements, there had been 12 collisions with cyclists. A new scheme was implemented to tackle this but failed to reduce the number of collisions at Pratt Street and Plender Street junctions.

TfL and borough traffic engineers worked closely with cycling groups through several iterations to ensure final designs were robust. Completed in 2013, new segregated 2,000mm-wide cycle lanes run down both sides of the road. This narrows available space for drivers resulting in lower speeds which makes it easier to anticipate cyclists' movements. The cycle lanes use a 'light touch' approach to segregation with armadillo road bumps and planters placed between cycles and cars. These add greenery to the streetscape and provide an effective but permeable barrier to cars, while allowing pedestrians to cross the road and board buses. Car parking bays have been relocated away from the footway, doubling up as buffers to protect cyclists against traffic. Bus stops have been redesigned to accommodate the new layout and junction signals have been changed or removed to smooth traffic.

Six months after these works, traffic speed dropped by up to 21 per cent. The route also rapidly grew in popularity with a 46 per cent increase in cyclist use. This has led to aspirations to extend the scheme north and southbound of the site.

Figure 26: The use of 'light touch' cycle delineation measures at Royal College Street has led to a greener environment where cyclists feel safer using the road. The result has been a reduction in vehicle speeds and an increase in cycle numbers

Before

1. Bi-directional cycle lane with physical segregation
2. Inconsistent and small tree pits
3. 400x400mm concrete slabs

After

1. Two single direction cycle lanes separated with armadillos and planters
2. 600x900mm concrete slabs
3. Bus stop bypass
4. Tree pits resurfaced and new trees planted

3.12 Reflecting local character

Clapham Old Town

London Borough of Lambeth
SW4
Completion date: 2014
Cost: £2.8m

Improvements

Recreate the space	☐
Rethink traffic management	☐
Relocate/merge functions	■
De-clutter	■
Tidy up	■

Following the success of the public realm works undertaken in Venn Street, the Clapham Old Town Regeneration Project launched another scheme to improve Clapham Old Town, aiming to stimulate the local economy, improve connectivity and the overall ambience of the area. Working with local residents and stakeholder groups, the design consultants proposed the public realm works in conjunction with new traffic and road layouts to reverse the surface use from 35 per cent footway and 65 per cent road, to 65 per cent footway and 35 per cent road, effectively giving it over to pedestrians.

Figure 27: The Clapham Old Town scheme responded to the area's distinctive local character through the use of high quality materials and innovative treatments to pedestrian areas

The most transformative change was the replacement of a fast gyratory around a cluster of bus stands with a new public space connecting to businesses and pedestrian walkways, while retaining an efficient bus service.

To encourage walking and cycling in the area, new cycle paths and parking were introduced.

Footways have been widened, trees planted and seating added to create a pleasant environment to walk and pedal through while retaining loading facilities for local businesses. 'Copenhagen crossings', which extend the footway surface across the road, feature along the high street. These prioritise pedestrians, improve streetscape legibility and maintain traffic through flow.

Before

1. Taxi stand
2. Paving slabs in poor condition
3. Car parking on carriageway

After

1. Taxi rank relocated onto footway and stand removed
2. Paving renewed
3. Cycle parking provided
4. Car parking provided on footway

3.13 Rebranding a town centre

Hornchurch

London Borough of Havering
RM11
Completion date: April 2013
Cost: £2.5m

Improvements

- Recreate the space
- Rethink traffic management
- Relocate/merge functions
- De-clutter
- Tidy up

Hornchurch town centre is an important district centre in Havering distinguished by its medieval street pattern and modern centre. Although Hornchurch's retail economy is relatively healthy, the recent downturn has had a negative impact on local businesses. The area also suffers from road congestion, poor personal safety, inadequate inclusive design features and a tired public realm.

Recognising the increasing need for intervention, London Borough of Havering set out a programme of works consisting of cultural and residential redevelopment, physical improvements to the high street and support to rebrand businesses.

Figure 28: Hornchurch High Street has benefited from a series of interventions aimed at enhancing the pedestrian environment and reducing the visual and physical impact of vehicular traffic, resulting in a more prosperous town centre

Key features of the scheme included a focus on improving pedestrian permeability. This was achieved by removing guardrail, placing crossings on desire lines, increasing the width of the footways and implementing a continual central pedestrian crossing strip. The scheme also improved social spaces through planting, new lighting, wayfinding and street furniture. In addition to these, traffic was smoothed, bus stops were made fully accessible, and better provisions for cycling were installed.

Further public realm works have begun with additional funding from TfL following the success of the high street's improvements, which won a 'highly commended' Urban Transport Design Award in 2014.

Before

1. Small modular paving
2. Cluttered streets

After

1. Footway paved in 600x900mm slabs
2. Wide central median implemented to encourage informal crossings
3. New formal crossings implemented
4. Street furniture rationalised and new trees planted
5. Utility covers paved in same material

3.14 Ensuring good design

High quality urban design is an essential component for building a great city such as London. Streetscape Guidance is a tool to support the best in design which should be combined with the skilled judgement and expertise of professionals.

Multidisciplinary design teams are essential for exemplary streetscape design. A broad range of skills are vital for understanding the complex interactions, issues and requirements of the street environment. We recommend working with specialists to provide consistency and excellence in design, and encourage design teams to seek advice on specialist disciplines irrespective of project size.

Project design briefs

A systematic process should be employed for all street projects whereby a clear and succinct project brief forms the basis for delivering a focused and robust design. Refer to the DfT's Manual for Streets (2007) and CABE's Good practice in brief-writing (2011) for further information on briefs.

TfL Pathway is an integrated and consistent framework with the clear objective to provide the tools for delivery teams and their stakeholders to work effectively. Underpinned by common project management principles, it emphasises professional judgement in its flexible application to manage and control specific programme, project and delivery portfolio scenarios. Pathway is part of the TfL Management System and its use is mandatory for all project, programme and delivery portfolio work at TfL. Our staff should refer to the 'Pathway Handbook – Managing the Project, Programme or Delivery Portfolio' for further information.

The design team is responsible for producing designs which satisfy the brief and are Pathway compliant. Irrespective of the prime objective of the project, opportunities for streetscape improvements should be taken advantage of in accordance with Streetscape Guidance.

Reviewing the design

Internal review programmes should be embedded in the project programme as part of the design process.

Designers can also obtain impartial advice from Urban Design London (UDL), which is supported by TfL and strives to work closely with practitioners and other organisations to improve the quality of place. UDL runs a design surgery programme which can assist in shaping design decisions at an early stage in the project, and can prove useful as a sounding board for draft designs. For more information, contact info@urbandesignlondon.com

The Mayor's Design Advisory Group (MDAG) also provides expert advice and advocacy to support design quality, and is another sounding board for London-wide design strategies and major schemes. MDAG reviews serve as a prerequisite for selected projects and as a gateway to progress from development to delivery.

All streetscape projects impacting the TLRN should seek the endorsement of our technical approvals managers as well as the SDRG. Contact streetscapeguidance@tfl.gov.uk for more information, or refer to Section 1.8 – How and when should I engage with TfL?

How do we deliver and maintain high quality streets?

The materials outlined in Streetscape Guidance in the coming sections are recommended for all London streets and should be used across the TLRN regardless of project size, unless our SDRG approves an alternative. Like-for-like replacements will not achieve the world's best-managed streets, if they are not already world-class. The replacement of small quantities of surface materials or street furniture to correct a defect requires careful consideration.

Appropriate and timely maintenance regimes are essential for ensuring that the streetscape design and materials retain the quality of function set out by the designer, and meet safety, serviceability and sustainability requirements.

Working with TfL

Our routine maintenance works follow the principles of good practice set out in this guidance. Capital renewal works may occur on a cycle of more than 20 years. It is important that streetscape works are recognised as long-term investments in the streetscape of the TLRN. Any changes to materials or layouts should be reviewed by TfL Engineering and our road safety auditors at an early stage in the design process to ensure the scheme remains a long-term investment.

At regular intervals, a review of all TLRN streets is conducted to look for opportunities to improve aesthetics. Better Streets principles are applied to identify and remove unnecessary street signs, clear graffiti, declutter, relocate or merge functions, and in rare cases, to rethink or recreate the street.

Figure 29: It is important that detailed consideration is given to material type and method of laying to ensure longevity

Additional information

Commission for Architecture and the Built Environment (CABE):

Good practice in brief-writing (2011): http://webarchive.nationalarchives.gov.uk/20110118095356/http:/www.cabe.org.uk/masterplans/preparing-a-project-brief/good-practice

Department for Transport

Manual for Streets (2007)

Part C New measures for new challenges

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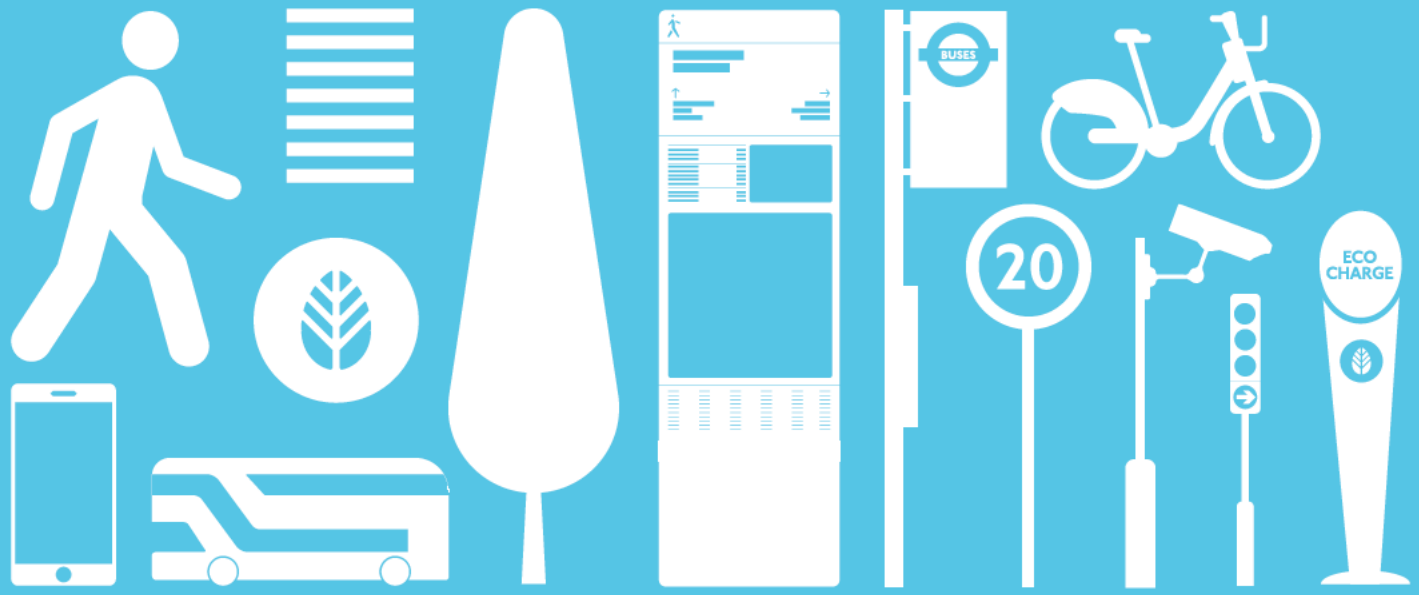

4.1 Encouraging innovation and creativity

As London grows, the demands and expectations on streets and places will also grow and continue to diversify.

Continuous improvement of London's streets and places is therefore critical in meeting this challenge and will rely on best practice, creativity and innovation to develop places that are fit for purpose and fit for the future.

Best practice is an evolving concept and relies on continuous learning, research and trials. To maintain London's world-class streets and places, the barriers that prevent the uptake of new and innovative ideas need to be overcome.

This will require closer collaboration, open minds and earlier engagement.

Figure 30: Our streets need to be flexible to meet the changing demands that are placed on the network

Figure 31: The installation of the Oxford Circus all round crossing improved safety and aesthetics

Figure 32: New applications and technologies are working to improve information about the status of our network

Table 1: The innovation cycle

Innovate	**1. Aspiration** – London's streets must work hard to function and perform at a high level as places where we live, work and move through • An evidenced-based approach to innovation is required
Exception process	**2. Innovation** – Streetscape Guidance encourages designers to continually innovate; working with researchers and designers to produce better, more efficient and more attractive design solutions • Draw on best practice • The innovation must solve a problem, increase functionality, or better serve the customer
Deliver	**3. Exception** – The proposal must demonstrate that the innovation fulfils criteria set out within the Streetscape Guidance • The safety and security of all road users is of primary importance • The innovation must provide adequate accessibility features
Evaluate	**4. Installation** – Once the product is installed, it must be monitored and assessed as part of an iterative process of design development
Standardise	**5. Streetscape materials palette** – Where a design solution can be applied in a practical and reliable way across a range of settings, the Streetscape Design Review Group may elect to adopt the innovation as part of the approved materials palette for the TLRN • Use the materials palette as a baseline for the minimum standard required on the TLRN • Research new ways to improve the palette

Creativity and innovation should be directed at improving the efficiency of movement, the effectiveness of place, and in a way that improves the overall street user experience. To illustrate the level of creativity desired on London's streets, Streetscape Guidance references domestic and international examples of innovative streetscapes and streetscape components. These examples are not intended to be prescriptive but serve to demonstrate what is possible by adopting an innovative design attitude. While London is unique in character and complexity, the examples throughout the document highlight what may be achieved on its streets.

4.2 Trials and tests

Achieving the vision for London's streets requires a willingness to adopt a wider range of measures to address the emerging needs and functions of streets and places. This can be realised through trials and tests at small cost and scale to provide an evidence base from which to make permanent and positive change.

Off-street trialling of new measures, products, materials or layouts in a controlled environment, such as those at the Transport Research Laboratory (TRL), is generally required prior to proceeding to a DfT authorised on-street trial.

Off-street trials allow for quality testing and the collection of user feedback to help shape and refine proposals. Proceeding immediately to on-street trials may be necessary for testing site specific temporary measures, though should be subject to a range of authorisations and performance criteria assessments to determine whether adjustments are required. The results of on-street trials will determine if the measure, product, material or layout can be successfully implemented at a wider scale across London.

We are championing creativity and innovation at TfL by turning approach into action. A collection of examples below describe how innovation and creativity are being applied across a number of different functions.

Figure 33: Examples of creativity and innovation that will occur throughout the document

Protected junction temporary trial Portland, USA

A 'protected intersection' designed to eliminate cycle-car conflicts

Key functions

Opportunity
Right turns at junctions can put cyclists into conflict with motor vehicles. A redesigned junction can remove this conflict.

Benefits
This reinterpretation of a Dutch cycle-friendly junction provides a phased and safe way to make a right turn. The introduction of kerbs within the junction reduces the crossing distance and offers a refuge to cyclists while they wait to complete their turn.

Implementation
Junctions that avoid merging cyclists and drivers have proven safer for both. This is a trial aimed at making junctions more comfortable for cyclists to use. Cycle friendly junctions take many forms and need to be adapted to their context.

The image shows a trial example of a cycle friendly junction in Portland, Oregon, USA (Image courtesy of Nick Falbo)

Applying in London
This Dutch inspired concept is being studied to determine its suitability for the London context. The hope is that the design will provide an increased sense and level of safety and comfort for cyclists, especially at busy junctions. At the moment this is a concept design which will require further design development and trialling prior to implementation.

Figure 34: Innovations and creative ideas are constantly being reviewed to determine if they are right for our network

Figure 35: CMS is being installed on street lights across the network

4.3 Infrastructure and assets fit for the future

Better asset management

We are introducing Central Management Systems (CMS) on TLRN street lights. This system will allow us to remotely monitor and manage street lighting, allowing for dynamic control of lighting levels. This will allow lighting levels to be aligned better with traffic flows and road use, reducing energy consumption and carbon emissions without compromising safety or security. The system also remotely records failures allowing maintenance crews to ensure lighting levels are restored in a timely manner. CMS will dramatically cut carbon dioxide (CO_2) emissions by 9,700 tonnes and save approximately £1.85m a year. In addition, we are replacing conventional lighting with light emitting diodes (LED) which are more energy efficient and last longer.

Key functions – moving, living, protecting, sustaining

Figure 36: Trixi mirror on signals

Enhanced safety features

Improving safety for all street users is a top priority to ensure London remains an attractive place in which to live, work and invest. To reduce the conflict between cyclists and large vehicles, we have trialled the use of street cycle safety mirrors (also known as trixi mirrors) to give drivers of large vehicles better visibility of cyclists at junctions.

Key functions – moving, protecting

Improved materials

Adopting smarter and more innovative materials can drive significant improvements to streetscape performance by reducing environmental impacts and costs. Porous asphalt has been used at trial locations to better drain highway and footway surfaces from storm water to improve safety and reduce demand on storm water systems.

Key functions – moving, functioning, protecting, sustaining

Providing future flexibility

A lack of public and road space in London necessitates the need for streets and places to make best use of what is available. Implementing flexible street designs can allow for changing use over time. This is currently being explored with the introduction of 'pocket parks', small spaces that serve as extensions to the footway to provide amenities and green space.

Key functions – moving, living, sustaining

Basic street improvements

Areas with high foot traffic should have good quality footways to make walking easy and enjoyable and provide a range of pedestrian facilities, including good seating and lighting. At TfL we are using Better Streets principles to improve London's streets over time using a holistic highway maintenance approach.

Key functions – moving, living, protecting, sustaining

Figure 37: Permeable asphalt allows water to infiltrate

Figure 38: Derbyshire Street Pocket Park

Figure 39: New pedestrian facilities have been provided at Holborn Circus

Greener streets

Greater efforts can be made to enhance the environmental quality of London's streets through the use of recyclable materials and drainage improvements. Clapham Old Town has built a new town square which features tree planting and planters with seating.

Key functions – living, sustaining

4.4 Making more efficient and flexible use of space

More efficient people movement

New street and junction layouts can be used to build up safe, well-connected networks for travel by foot and cycle. We have sponsored UK trials of Dutch-style roundabouts for main roads. These use an orbital cycle track to separate cycles from motor traffic. This design minimises conflict and increases safety.

Key functions – moving, living, sustaining

Safer speed environments

Limiting traffic speeds through effective street design is important for cyclists and pedestrians. The introduction of 20mph trial zones and centreline removal studies takes a major step towards enhancing the quality of the streetscape beyond that of materials and layouts. Results suggest a consistent decrease in vehicle speeds as a result of these interventions.

Key functions – moving, living, sustaining

Figure 40: Clapham Old Town's new town square

Figure 41: Dutch style roundabout being trialled at TRL

Figure 42: 20mph speed limit

Enjoyable and active streets

As more people and families choose to live in London and its population grows, more is needed to get the most from public space, including the streets themselves. Around 4,000 planned events are already accommodated on London's streets every year. Simple but powerful ideas and showcase events can bring streets to life, boosting tourism, local economies and community interaction.

Key functions – moving, living

Re-imagined streets and places

London must evolve to keep pace with the aspirations and needs of its population. There are a number of locations across the city that benefit from implementing bold new design and traffic management to support safety and regeneration. We supported a shared space scheme on Exhibition Road, South Kensington, to great effect following extensive local engagement.

Key functions – moving, living, sustaining

Enhanced public realm

Balancing user priorities, especially the needs of pedestrians and cyclists, is often challenging in busy urban contexts. We are trialling new configurations, phasing and infrastructure to respond to the most challenging junctions and increase permeability across London.

Key functions – moving, living, protecting

Figure 43: Tour of Britain at Westminster Bridge

Figure 44: Exhibition Road has been reimagined

Figure 45: Hornchurch town centre redesigned to allow for informal crossings

Informal spaces

The creation of temporary and reversible city living spaces can support local initiatives to give streets a radical makeover in low cost and imaginative ways.

Key functions – moving, living

4.5 Intelligent systems and management

More dynamic information

We are promoting the use of cutting-edge cooperative technology at TfL to communicate with all streetscape users in real time to examine and improve customer experience, reliability, safety and the environment. Trials in this area include a real-time, state-of-the-art digital screen mapping tool at a Regent Street bus stop. The bus stop incorporates a data feed of live departure information. We share information across the modes and work with businesses to make this information accessible to all.

Key functions – moving, functioning, living

4.6 Changing behaviour and enabling different choices

Land use planning

High density, mixed-use development schemes with embedded walking and cycling infrastructure can ensure that travel by foot or cycle is the most competitive option for short and medium journeys. We are working with developers to promote schemes that implement car-free and 'car-lite' proposals, including the provision of Mayor's Cycle Hire Scheme and/or car club infrastructure to offer an attractive alternative to car ownership or use.

Key functions – moving, living, sustaining

Figure 46: Café seating in front of a pub

Figure 47: Interactive screen in a London bus shelter

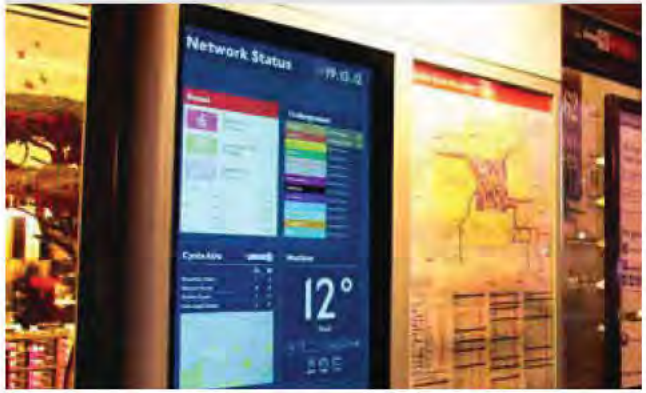

Figure 48: The Shard at London Bridge

Additional information:

Transport for London:

International Cycle Infrastructure Best Practice Study, 2014
Network Operating Strategy, 2011
Highway Licensing and Other Consents, 2011

Licence application:

http://www.tfl.gov.uk/info-for/urban-planning-and-construction/

Legislation:

The Highways Act 1980

Infrastructure Commission:

World class infrastructure for a world city, 2010

Part D Balancing priorities

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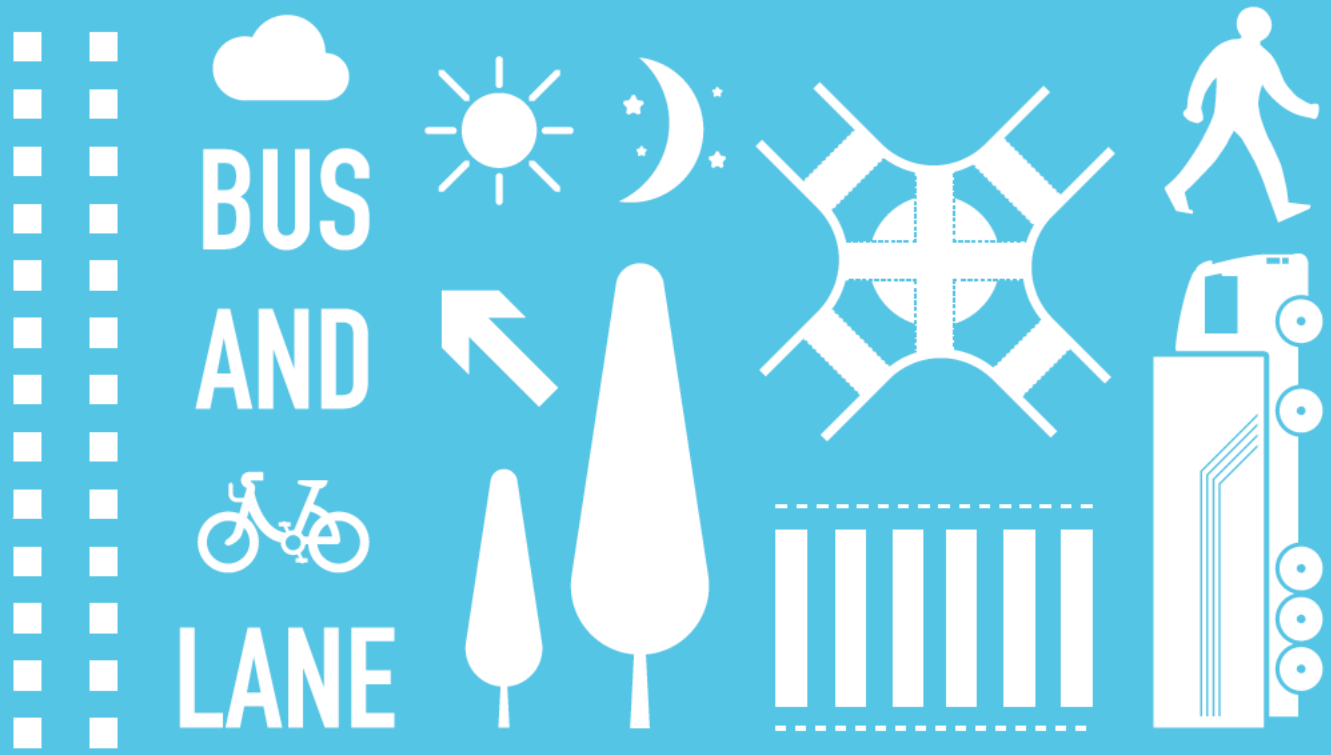


5.1 Accommodating movement

Streets are dynamic environments with movement playing a significant role in defining the character of the streetscape. The streetscape should act as a calm backdrop to facilitate movement in a logical, consistent and cohesive manner, acknowledging that streets are vibrant places of activity for a wide range of users.

Regardless of the mode of transport, all users require convenient, direct, safe, legible routes that are efficient and reliable. The design challenge is to facilitate these principles within the context of a confined street where different modes often require significantly different types of infrastructure. Only through a robust design process, backed up by safety and quality audits, can these objectives be achieved for all road users.

5.2 Understanding competing demands

Streets need to manage a wide range of road users and their competing demands by providing clear but flexible spaces, with consistent and legible features that acknowledge where, when and how users should interact. Priorities should be applied to best provide for efficient and safe movement of people, goods and services, while reflecting and enhancing the character of the place.

Detailed consideration should be given as to how different users inhabit, interpret and compete for the finite space available on streets. Particular attention needs to be given to accessibility and ease of movement for less able and less confident street users, which should be established through best practice design and consultation with accessibility groups and officers.

Figure 49: Streets support movement and can play a significant role in defining its character

5.3 Recognising place

A place is more than the sum of its spatial and physical attributes: the buildings, streets and spaces. A place is a location of meaning; one where everyday life occurs. Spaces are transformed through individual and communal experience into places. Places are diverse, dynamic, socially responsive and can range in cultural meaning. Places can also be considered across a multitude of scales; a seat within a park could be considered a 'place', or a park within a neighbourhood.

Successful streets and places tend to have common characteristics. These can be summarised as those places which have a distinct identity, vitality, are flexible, safe and easy to navigate.

Figure 50: Successful places are flexible, easy to access and navigate, locally identifiable and responsive to the needs of its users

5.4 Function, performance and form

While it may seem that the role of a street is defined and fixed, it is important to consider that spaces evolve, and that the function, performance and form of a street may change over time as a result of urban form redevelopment, changing demands, alterations to surrounding street network, new public transport stops etc. Designers should always consider the future aspirations of the street and surrounding area when developing proposals to ensure that they can respond successfully to change.

Function

Considering how the street functions in the wider movement network is a vital first step towards putting forward proposals which enable the street to perform better. A balanced design strategy must reflect the type and quantity of activity that exists on the street and ensure that all users are considered throughout the design process through quantitative analysis of the street.

Figure 51: Euston Circus sees large volumes of vehicles daily

Performance

Complex modal interactions regularly occur within the urban environment, for example, where pedestrians cross informally on desire lines or walk on the carriageway. Common activities not endorsed by or discouraged by existing infrastructure may indicate that the street is not performing well.

It is important to analyse the performance of the road network to ascertain how well the street is fulfilling its intended function and establish where changes can be made to improve conditions. For most roads, the width, speed limit, extent of kerbside activity, frequency of side roads and crossings, play a major role in how well the road is performing.

Many roads in London typically exhibit a morning and evening peak in use. However there are exceptions, such as some locations in central London, where roads are at capacity for most parts of the day. Measures to enhance capacity should be balanced so as not to compromise other uses.

Figure 52: Congestion may indicate that a street is not performing its intended function

Figure 53: Roads must perform well for all intended users

Figure 54: Streets need to be designed flexibly to allow for use at all times of the day

Form

Understanding the role and sense of place of the street or space is important for establishing how to compose its physical form and assist with the selection of materials that are of an appropriate scale, mix and fit for purpose.

When assessing the sense of place, it is essential to understand the site-specific qualities of the street and its surrounding area. These should be incorporated throughout the design process and can be established through a variety of techniques including site surveys, public consultation, mapping of historic street patterns, topographic surveys, public realm quality assessments, open space studies, land use analysis and townscape character assessments.

These methodologies can help to construct a detailed understanding of the place. They can also help identify constraints and opportunities, and should be used to inform the design brief.

Figure 55: Westminster Bridge

5.5. Facilitating place

Public space

Public spaces are at the cornerstone of all human interaction and engagement in London, with the majority of public life played out on the streets and public realm. The design of these spaces can have a significant impact on people's sense of belonging and quality of life as they can play a large role in promoting social cohesion and better mental and physical health.

Successful public realm allows for the congregation of people and social interaction to take place at all levels of the community. It offers different activities, caters for a variety of users, is safe and enjoyable to spend time in during both the day and night, and enhances the sense of place and identity of an area through cohesive integration with its surroundings.

Figure 56: Leicester Square is a vibrant London destination

In urban areas, public spaces can be considered as all areas open and accessible to the general public, and can include those spaces between buildings, parks, highways and cycleways. On streets, public spaces can be considered as any part of the streetscape where there is an opportunity for encouraging social activity. These can be gathering spots, places for interaction or simply a place to rest.

There are many important elements required to facilitate the design and maintenance of great streets, however, we would like to highlight four aspects of street design found to be critical in London. These include townscape character, local identity, heritage, and crime prevention and are briefly covered below. For further information on street design, please refer to following websites:

- www.livingstreets.org.uk
- www.designcouncil.org.uk
- www.landscapeinstitute.co.uk
- www.architecture.com

Townscape character

The aesthetic character and functional requirements of the surrounding buildings should be considered together with the street layout as part of an integrated composition. The urban structure, density and mix, together with the scale, massing and general appearance of buildings should influence the designer's

response. Designers should be sensitive to the architectural character of the buildings, their rhythm and scale and how these features can be reflected through detail in the streetscape.

Consideration should be given to other townscape elements such as framing of key vistas and landmarks, the texture, pattern and character of existing building materials, and the impact of microclimate and overshadowing as a result of tall buildings.

Figure 57: The street provides a neutral canvas that supports diverse architecture

Local identity

Local identity can be considered as the sense of distinctiveness defined by an individual or community. The look and feel of the streetscape impacts on how people perceive and respond to the street: it affects where people spend time and shop; where businesses choose to invest; it affects how neighbourhoods physically connect to each other; and it impacts on how people choose to travel. A poorly connected community with streets that are unattractive for walking will likely develop a completely different local identity to that of a neighbouring community which is well connected to retail centres with a vibrant street environment.

Figure 58: Coloured surfaces reinforce signalised diagonal crossings for pedestrian movements

Designers should seek to reflect identity by engaging with local authorities and working collaboratively with communities to identify the attributes of the place which are important to local people.

It is important to be contextually aware, using the materials palette sensitively, detailing to a high standard, with careful placement and rationalisation of street furniture, signage and road markings to ensure context, character and identity are respected.

Heritage

Buildings and elements within the streetscape provide symbols of community identity and are a focus for civic life. These assets and their setting should be celebrated so that their cultural and aesthetic value can be appreciated.

Figure 59: Cyclists riding past Victoria Tower and the Houses of Parliament

When dealing with heritage assets, it is important to consider that while the materials in this guidance are applicable in most circumstances, special treatments may be appropriate in accordance with areas of particular significance and the SDRG should be consulted in these instances.

It is the design team's responsibility to consult the relevant authority to establish the exact location and particular requirements of heritage sites and features, and the local authority's conservation officer should be consulted in all instances.

Detailed advice on conservation of assets in the urban environment is provided in Historic England's guidance The Setting of Heritage Assets (2011) which is recommended for assessing the value of the setting and the implications for change. For information on designated heritage assets, locally important buildings, archaeological remains and landscapes, contact the Greater London Archaeology Advisory Service, Heritage Environment Record at glher@HistoricEngland.org.uk

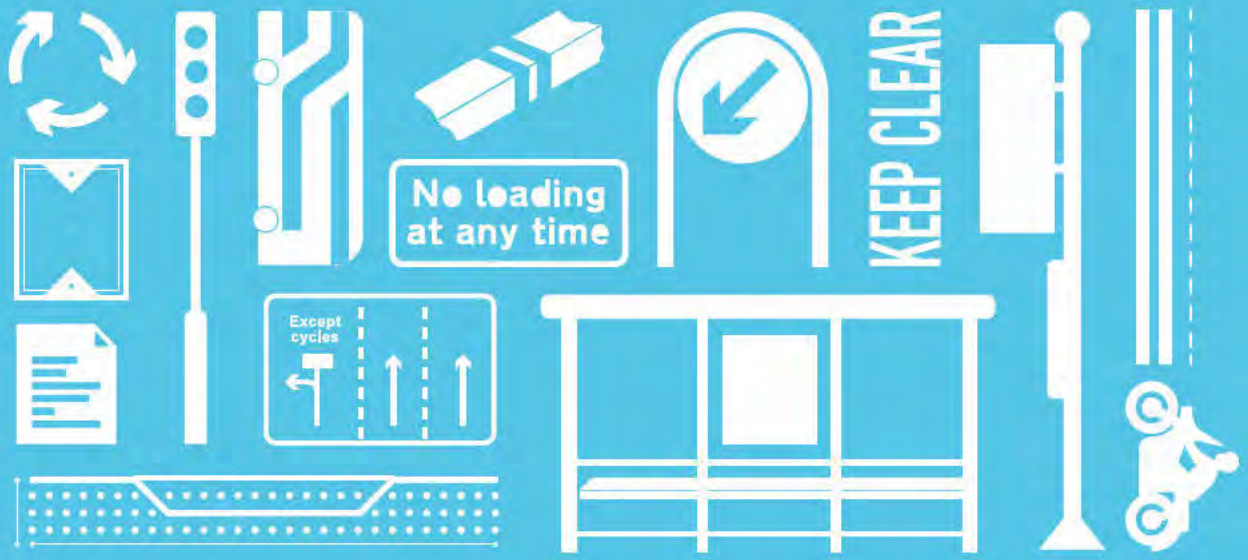
Crime prevention

All designers should seek to provide safe and secure environments, as outlined in Section 17 of the Crime and Disorder Act 1998. Our transport community safety managers can provide advice to help design teams meet their duties under the Act.

When developing public space design, contact should be made with a crime prevention officer to understand existing crime patterns early in the design process and ensure steps are taken to mitigate risk. Consideration should also be given to ensuring that routes designed exclusively for non-motorised users should be well-lit, overlooked (preferably by active frontages) well-connected, direct, following desire lines, and wide enough to avoid blind corners.

Figure 60: Safe and secure environments: A Metropolitan Police Service officer

Part E Physical design and materials



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6 Introduction

Part E of Streetscape Guidance provides layout and design information, including layout drawings. It sets out a vision for London's streets, covering a broad range of topics. This section has been structured to reflect the discrete spaces and materials that are encountered on the street, footways, carriageways, crossings; activities that occur between the carriageway and the footway; and amenities on the footway including those that provide safety and comfort functions, elements that occur on any street environment and interchange zone.

Each section is introduced by a vision for the future and is followed by a breakdown of how to best achieve the vision.

Part E begins by discussing surface material in three sections: 'High quality footways', 'Carriageways' and 'Crossings'. These sections cover a standard palette of materials, preferred layouts, and selection criteria for those materials.

The following section, 'Kerbside activity', details how functions such as parking and loading bays, bus stops, and parking control can be accommodated in a range of circumstances.

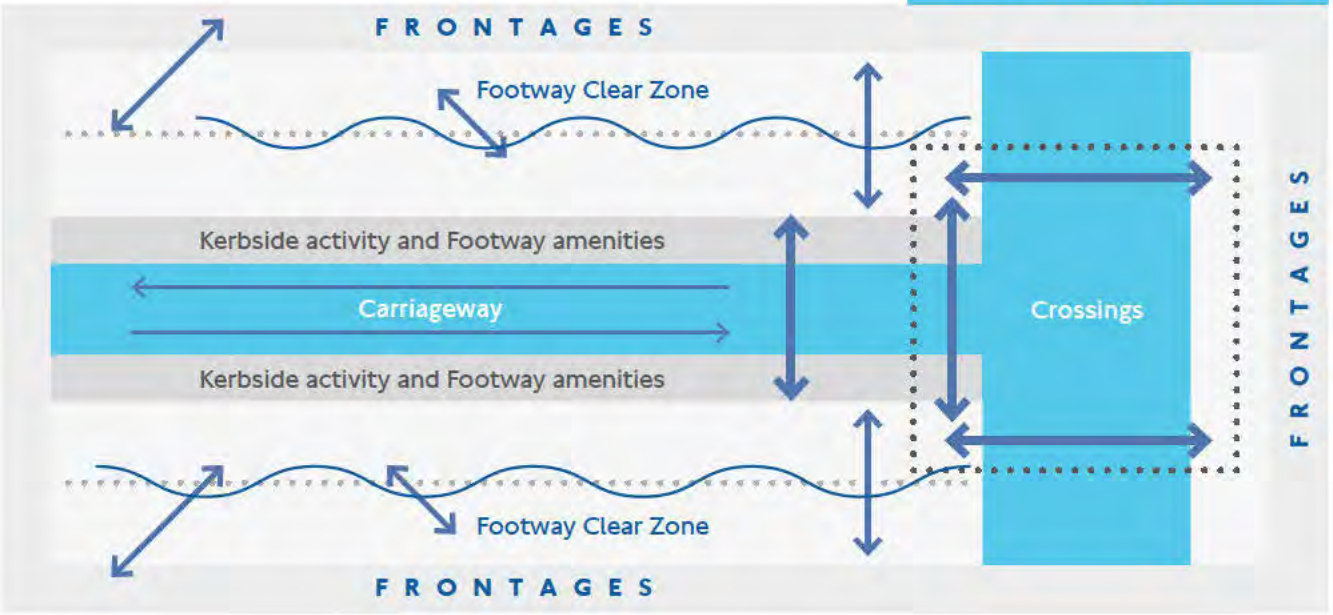
The next two sections, 'Footway amenities' and 'Safety and functionality', deal with components on the footway that provide a comfort, convenience or facility to enrich the street environment or to provide another essential function.

The 'Street environment' section outlines the elements essential to achieving a comfortable street for all users. Information is also provided on how to treat leftover spaces in the public realm and seek out opportunities for pocket parks.

Finally, a section on 'Transport interchanges' covers those areas where more than one transport mode combines to form an interchange environment. This section details how to treat on-street interchanges for various modes, and how specific design consideration is required to ensure successful integration with the surrounding street network.

While the principles included within Part E are provided by ourselves as exemplary practice, reference is also made to wider best practice, relevant guidance and technical documents which offer more detailed information on how a designer should approach a specific area.

Street Design Zones



Part E High quality footways

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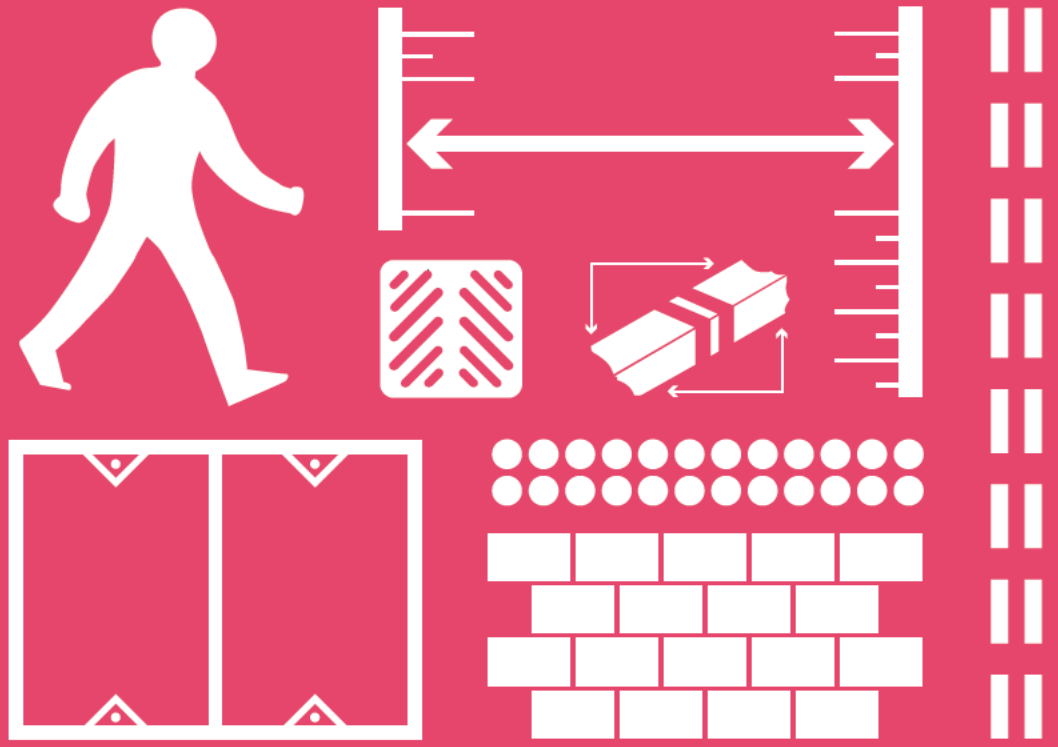


7.1 Vision

Paving forms the background for almost every street scene and it is our intention to provide high quality environments that are robust, timeless and beautiful. At the heart of all well-designed streetscapes are high quality surfaces that are visually appealing and functional. Good footways are simple, durable and well maintained. Well-considered surfaces will tie together the disparate elements of the setting, making it comfortable and enjoyable to linger. The following section provides guidance on how to achieve high quality footways in London through the recommendation of footway materials, layout and application.

7.2 Footway materials

We aim to ensure that London's streets are safe, reliable and well maintained. Footway materials should respond to the distinctiveness of the area as a neutral 'carpet' that complements adjacent buildings rather than standing out in their own right. To achieve this, Streetscape Guidance recommends a simple and durable selection of footway materials applied in standard sizes: concrete, a limited palette of natural stone materials and asphalt.

All footway materials should be applied to achieve a high quality finish. The requirement for a 'high quality finish' does not mean that the most expensive materials are used, rather, that the composition and application of materials are well executed to achieve the best possible result. Careful consideration should be given not just to the footway material, but also the kerb type, tactile paving design and the overall composition that these components create.

This section highlights the recommended materials, layout and application of footway surfaces. Please note that any deviations from this guidance will require approval from the SDRG.

Concrete slabs for footways

TLRN standards:

Colour: Grey natural

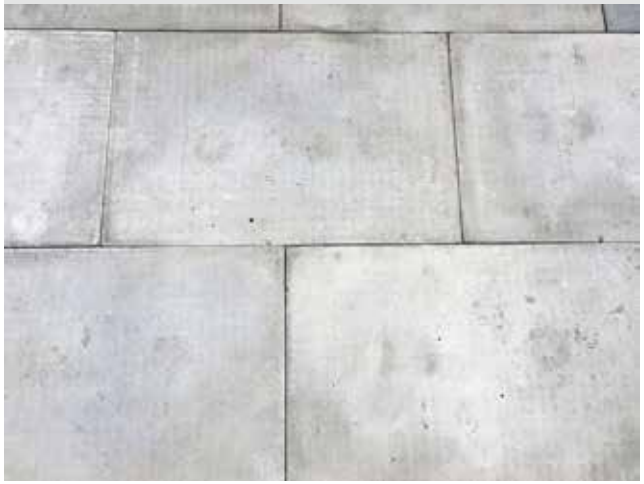
Finish: Pimpled

Dimensions: 900x600mm

Application: Preferred for extensive new areas of paving across most urban settings.

- Concrete and artificial stone paving (ASP) are the most common paving materials used on the TLRN and are TfL's preferred choice for large parts of the network

Figure 61: 900x600mm concrete slabs



Advantages:

- Cost effective
- Convenient to source
- Easy to cut and dress
- Can last between 20-40 years
- Can be reinforced to avoid cracking where vehicles are likely to mount the kerb

Disadvantages:

- The general appearance is utilitarian which may not be sufficient for special areas
- Can crack easily if mounted on poor construction base
- A moderate maintenance regime is required

Considerations:

- When considering a phased approach, designers should recognise that initially the interface will be evident between existing and new paving but will wear to provide a more seamless appearance
- Designers should work with adjacent property owners to better integrate private forecourts and promote a seamless use of paving materials across the footway
- Where the slabs are required to be cut, 600x450mm, 600mm and 750mm may be used to reduce onsite cutting and wastage. These sizes should not be used as standard within the footway without SDRG approval. Loading requirement must be considered when designing joints and structure. It is important to evaluate mechanical sweeping when designing a footway and in such cases butt finishes should be avoided. Bedding materials should be selected with equal care dependant on loading

Construction:

- Setting out of slabs including their orientation should be specified and based on existing interfaces or centrelines
- Chamfered edge concrete slabs should not be used

Figure 62: London Bridge is paved in concrete

Granite slabs for footways

TLRN standards:

Colour: Silver grey (also available in other colours)

Finish: Fine-picked

Dimensions: 900x600mm slabs (standard)

Application:

- Suitable in areas of high civic importance or adjacent to large new developments
- Granite is typically used as a paving surface within a distinct and defined area to highlight the area's importance
- Historically, granite was used extensively for footways and carriageways as small setts. More recently larger granite slabs have proved to be a durable and attractive material for footways. Bespoke treatments, including alternative dimensions and colours which are not standard, require SDRG approval

Figure 63: 900x600mm granite slabs

Advantages:

- High quality, organic appearance
- Durable, long lifespan, reusable and wears well with minimal colour fade
- Combines well with other footway materials
- Can be cut to size and dressed as required
- Relatively low maintenance
- A range of finishes and textures are available to achieve different effects using the same stone. Bespoke finishes must be approved by the SDRG

Disadvantages:

- High material cost
- Less convenient to source
- Installation can be more time consuming and costly than concrete

Considerations:

- The replacement of broken slabs that accurately colour match existing paving can be difficult as sourcing the same stone can be costly and time consuming
- Where the slabs are required to be cut, 600x450mm, 600mm and 750mm may be used to reduce onsite cutting and wastage. These sizes should not be used as standard within the footway without SDRG approval
- There are some circumstances where 100x100mm or 100x200mm stone setts may be used (see Carriageways for further guidance)
- Loading requirement must be considered when designing joints and structure. It is important to evaluate mechanical sweeping when designing a footway and in such cases butt finishes should be avoided. Bedding materials should be selected with equal care dependant on loading

Construction:

- Setting out of slabs including their orientation should be specified and based on existing interfaces or centrelines

Figure 64: Euston Circus uses two shades of granite paving

Yorkstone slabs for footways

TLRN standards:

Colour: Natural buff

Finish: Diamond sawn

Dimensions: 900x600mm slabs (standard) or variable lengthx600mm

Application:

- Yorkstone paving should be considered for use in conservation areas, sites of historic significance and locations with a high civic importance
- Existing Yorkstone should be recycled

Advantages:

- Attractive, organic appearance
- In keeping with much of London's traditional character
- Low maintenance
- Has a long lifespan if installed well; 60 years or more
- Can be cut to size and dressed as required
- Can be laid to sit alongside concrete slabs – this requires an aesthetic transition line, for example, tactile paving, crossover, etc

Disadvantages:

- High material cost
- Prone to fracturing if on an inadequate subbase
- Installation requires excellent workmanship
- Prone to staining

Considerations:

- Most locations should use a diamond sawn finish. However, it may be appropriate to use a flame texture, riven or reclaimed Yorkstone for repairs or to match an existing area
- To minimise waste and maintain a high quality finish, the length of the Yorkstone slab may be less than the prescribed 900mm, as long as it remains greater than the width and has a minimum bond stagger of at least 150mm
- Service ducting should be aligned in a strip and a flag removal method should be identified to minimise damage during service maintenance
- Loading requirement must be considered when designing joints and structure. It is important to evaluate mechanical sweeping when designing a footway and in such cases butt finishes should be avoided. Bedding materials should be selected with equal care dependant on loading.

Construction:

- No break joints less than 150mm on alternate courses and they should not be notched into each other
- Joints between slabs should have a uniform 8-10mm joint or if the specification is for close joints, the dimension is five to six millimetres

Figure 65: 900x600mm Yorkstone slabs

Figure 66: Yorkshire paving sits well alongside granite and concrete paving

Asphalt surfacing for footways

TLRN standards:

Colour: Neutral grey

Finish: Variable aggregate gradings acceptable

Application:

- Footways where structures such as cellars, subways or bridges are located directly beneath the surface
- Footways carrying shallow utilities
- Expansive areas of footway in suburban or rural-suburban areas with grassed verges
- Footways where vehicles regularly mount the kerb
- Cycle lanes and tracks
- Heavy footway crossovers

Figure 67: Asphalt paving

- Asphalt surfacing should not be disregarded as an inferior product to paving slabs as it can achieve an equally high quality finish when executed well. Always consult an experienced materials engineer to help decide on the appropriate bituminous mixture for particular surfacing requirements
- Shared footway/cycleways

Advantages:

- Construction is relatively fast and straightforward
- Finish is even and joint-free thereby reducing the risk of trip hazards and cracking
- Durable
- Easy to reinstate and recycle

Disadvantages:

- Reinstatement of asphalt paving can create a 'patchwork' effect
- A crossfall of two per cent is required
- Can deform with frequent heavy vehicle overrun if underlay is insufficient

Considerations:

- For areas that have a higher place value, consider using 300mm wide granite kerbs to emphasise the pedestrian realm
- Where it is anticipated services will regularly need to be accessed asphalt is not recommended as frequent reinstatement will degrade the appearance
- It is recommended that mastic asphalt is used for areas where waterproofing is essential

Construction:

- Recommendations for the laying of various asphalts are given in BS 594987

Figure 68: Westminster Bridge is paved with asphalt and wide kerbs

Footway construction

Consistent application is important for maintaining a clean aesthetic. Footway surfaces should be firm, slip resistant, and low in reflectivity, laid in a manner which is comfortable underfoot, minimises the risk of trip hazards and is well drained.

Structural design depends on the level of everyday use, the risk of vehicle overrun and the existing ground conditions. The relevant standard must be used to design the footway.

Joints and cuts

The following jointing parameters should be applied when selecting materials and constructing the surface:

Optimum jointing spacing	2-5mm between paving slabs
Acceptable joint spacing filled with compacted mortar	6-10mm between paving slabs
Maximum size of opening for covers and gratings	13mm

Design teams should consider the use of cuts to achieve changes in gradients where paving slabs are used. Generally the number of cuts should be kept to a minimum and a single straight line cut used as opposed to several. Residual slab lengths of less than 150mm should be avoided.

Where two footways intersect at awkward geometries, paving should be cut to ensure a clean aesthetic and respond appropriately to the road hierarchy and the building line. Generally, the primary road should take priority, with surface materials cut to provide continuity along this route.

Figure 69: Careful attention should be given to the treatment and appropriate cutting at locations where surface materials of different types or alignments join. The footway on the left side of the cut line shown in this image has taken precedence, as the primary road of the two

Figure 70: Paving units cut in a radial pattern could be appropriate at certain locations

An alternative approach is to cut the units in a radial pattern. Generally this approach should be reserved for wide or long corner radii and as a response to the adjacent building architecture.

Mortar

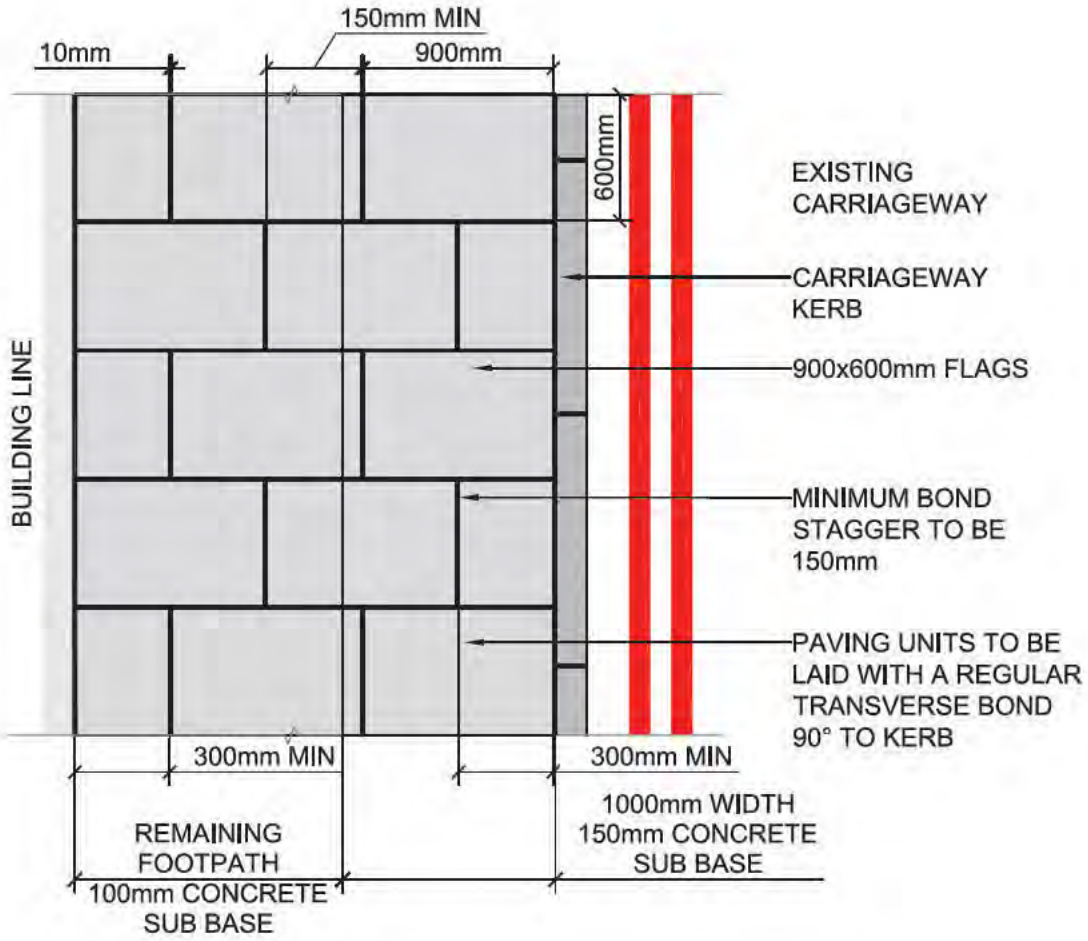
Where it is used, mortar has a significant impact on the aesthetic quality and overall appearance of the paving surface. Close butt jointing should be provided where possible to ensure a continuous high quality surface without a visible network of mortar joints. Good edge restraint on both sides is essential to prevent spreading. Where footways do not abut a kerb or existing wall, precast concrete edging is required. Clean joints at kerb edge and back of footway are required by careful detailing and cutting pre-construction.

Mortar infills must be avoided at the backs of kerbs, at building facades and around utility covers. Infills should be kept to a minimum around posts and special core drilled flags are recommended to ensure good fitting.

Quality control

A sample panel may be constructed at the start of the construction phase to establish specified standards of workmanship for the scheme, acting as a quality benchmark. Typically a sample panel area would cover around 30 square metres of footway and represent most features in the build, including a kerb edge, building line, inspection covers, a radius and at least one dropped kerb.

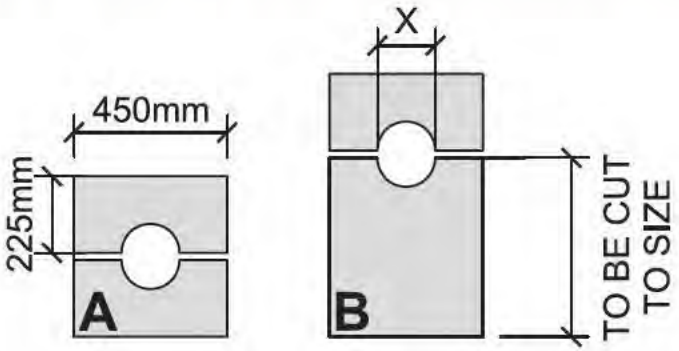
Figure 71: Paving slabs should be laid out as shown here



Notes :

1. Paving units to be laid out with a regular transverse bond across the footway at 90 degrees to the kerb.
2. Minimum bond stagger should be 150mm.
3. Designers should consider the layout of the paving to anticipate the minimising the amount of cuts that will be required and avoid creating small slivers of paving
4. Patterns which incorporate multiple sizes of flags or gauged width layouts are generally not recommended but may be considered for special areas or adjacent to larger civic or commercial projects.
5. When interfacing with private forecourts, cellars or basement lights, additional care should be taken to ensure that footway materials adjoin with surrounding materials smoothly by aligning with existing edges. it may be advantageous to gain the consent of the owner to realign or renew a small area of private forecourt to Improve the overall footway design. if the forecourt is to remain private, it is usual to define the property boundary with metal studs on the footway surface.

Figure 72: Required cuts around signal poles, columns and rails



Notes:

Optional treatment around posts:

1. Pedestrian all fasteners shall be stainless steel.
2. Concrete ready-made at lengths of A=225mm and B=525mm with semi-circular cut-out with variable diameter from X=60mm to X=230mm.
3. Onsite core drilled flag with semi-circular arrangement as indicated.

Figure 73: Paving layouts turning a 90 degree corner

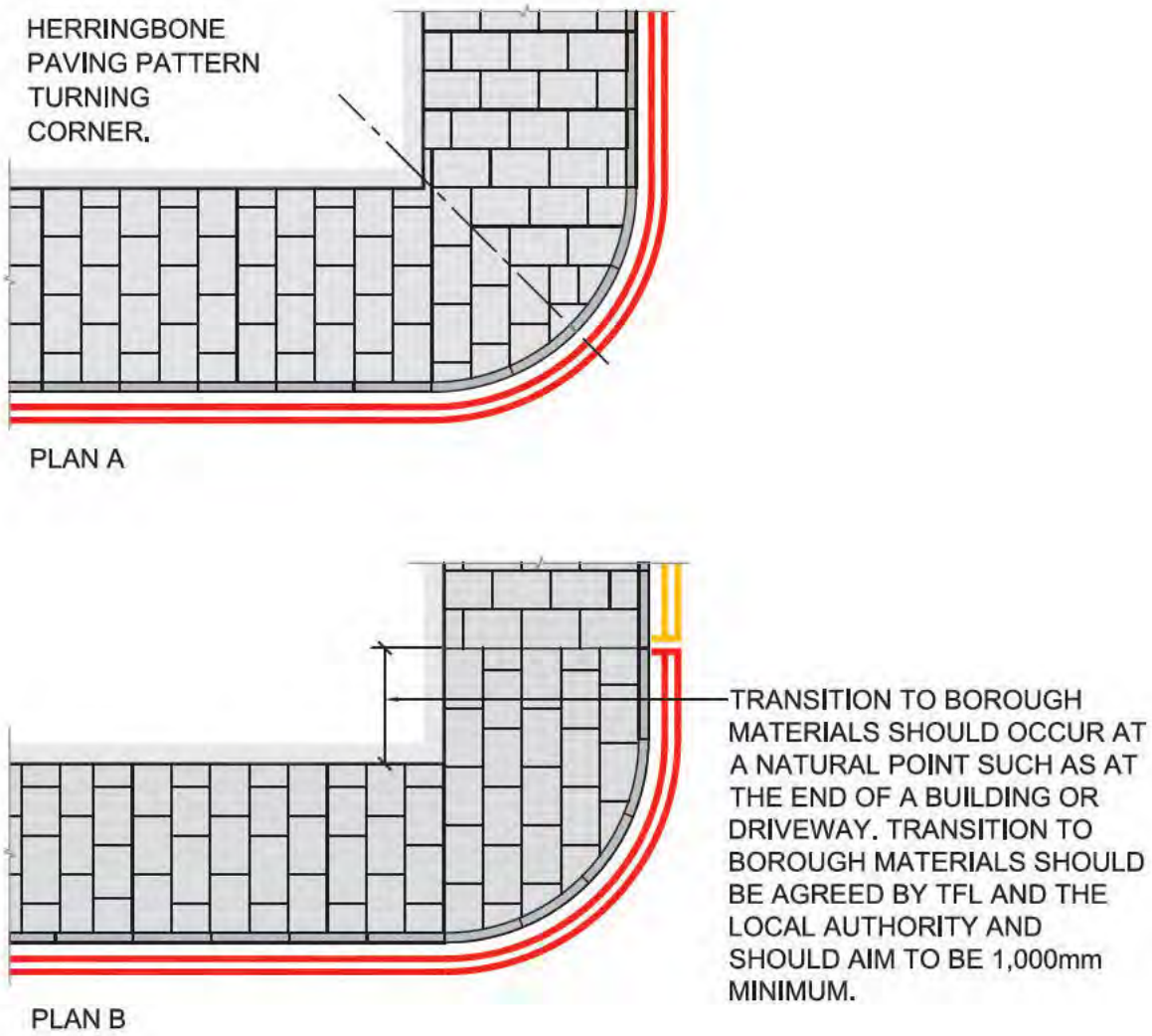
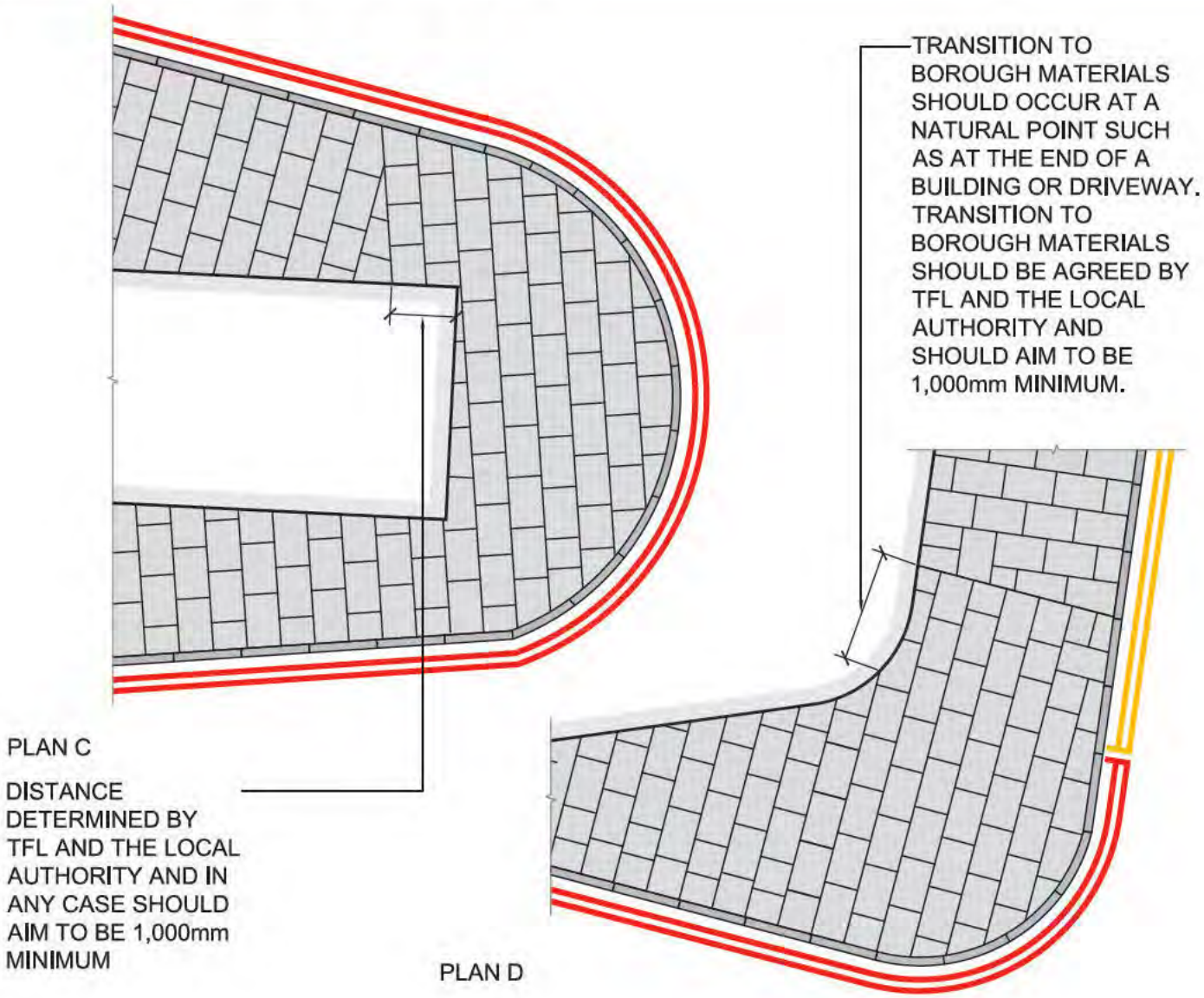


Figure 74: Paving layouts turning irregular corners



Additional information

Department for Transport, Highways Agency:

Design Manual for Roads and Bridges, Volume 6, Section 3, Part 4 TA81/99: Coloured Surfacing in Road Layout (Excluding Traffic Calming)

Design Manual for Roads and Bridges, Volume 7, Section 2, HD 39/01 Footway Design

British Standards:

BS EN 1341: provides guidance on the breaking load for setts and identifies some building specifications.

BS 7533: Part 4 offers a standard method of construction for pavements in natural stone or concrete pavers, including slabs.

BS 7533: Parts 7 and 10 offer a standard method for laying natural stone setts where traffic levels exceed 200 or 1,000 standard axles per day.

BS 7533: Part 12 provides sub-structure advice and shows the construction specification required for pedestrian areas which are occasionally used by vehicles. This detail applies to most pavement crossovers where vehicles occasionally drive on to them.

Transport Research Laboratory:

Footways and cycle route design, construction and maintenance guide

Commission for Architecture and the Built Environment (CABE):

Paving the way: How we achieve clean, safe and attractive streets, 2002

English Heritage:

Streets for All, 2005

7.3 Interfaces and transitions

Detailing of edges, insertions and level changes within paving should be resolved by the design team before construction and should not be left to site operatives. This is particularly important for how materials interface with the surrounding area, whether a borough road or a continuation of the TLRN.

Design teams should consider how the scheme terminates, where the edge is located and how to best tie-in with the adjoining street materials.

Figure 75: Yorkstone transitioning to granite setts with a flush granite kerb acting as a border

Good practice

Scheme boundary treatments:

- The scheme boundary should be detailed to provide a smooth transition between new and old materials, with appropriate edge restraints as required, ensuring alignment resilience
- Where possible, materials should terminate at a point which responds to the surrounding built character, for example, where a building frontage ends, or is aligned to a prominent feature such as a wall or street tree
- For side roads perpendicular to the TLRN, the surface material should continue around the corner for a minimum of 1,000mm
- Aim to avoid making a transition across an inspection cover as this will require additional work in cutting surface materials and result in the creation of small fragments of paving
- It is often more practical for new carriageway surfacing to not directly align with new footway materials. The scheme limits for the carriageway and footway should be resolved separately and detailed based on site-specific issues relating to the existing surface condition and drainage
- Any interface point should be discussed with the respective borough to reach an agreement on where the boundary limits should be extended to and how best to transition to borough materials

Materials

- Designers should look to optimise the modular nature of paving products to minimise cutting
- Footway materials should always be consistent on either side of the carriageway to provide visual continuity
- Any new surfacing should continue across the full width of the footway. This may be difficult to achieve where private forecourts or basements adjoin a building frontage. Design teams should work with shopfront owners to identify opportunities for continuing the paving across the forecourt to the building edge. This provides a far more visually attractive finish to the footway

Figure 76: 900x600mm concrete slabs transitioning to granite

Material transitions

Same modular size

Where new paving meets existing paving of the same size of unit, every effort should be made to ensure that the new paving units align directly with the surrounding materials and interlock.

Different modular sizes

Where new paving meets existing paving of a smaller unit size, a clean transition should be sought, such that new paving units are cut to provide a straight finish across the footway.

It is generally recommended that this cut should be at right angles to the kerb edge; however, it may be more appropriate in some instances where the footway is wide or the building line especially prominent, for the transition cut to be at right angles to the building.

Figure 77: Asphalt transitioning to 900x600mm concrete slabs with edging strip

Paving to asphalt

Where slabs meet non-paved areas, a clean line adjacent to the kerb edge should be implemented with a single row of slabs cut to one-third width 900x200mm and laid lengthways at the interface. This is particularly effective as a detail for natural stone surface edge treatments.

New developments

New building developments that front on to the road network will inherently change the character of the street. This especially relates to any changes that are made to the land use at ground floor level, the height of the new building, and the materials that are used in its construction.

New developments may therefore provide an opportunity to justify changes and improvements to the design of the street to meet new local requirements. This may include making improvements to surface materials, integrating additional street furniture and planting, or providing new crossing facilities and improved access to local public transport.

Building density and massing

In line with London development policies, new developments typically provide higher densities and greater building heights, putting additional pressure on the public realm to perform better for more people.

The ratio of building height to street width significantly impacts on the quality and experience of the public realm for all users.

Higher buildings can create a more overbearing presence on the streetscape, creating increased areas of shade and changing wind patterns and microclimate. This should be considered when planning for any new tree planting or seating in the area.

Buildings at the back edge of the footway, with no front garden or forecourt and a continuous frontage create a strong sense of enclosure and a more urban streetscape character.

Figure 78: A private development transitions subtly to the TLRN through use of similar materials and coordination with the streetscape

Land use changes and public realm design

New active frontages and building uses should be supported by reconsidering the design of the public realm where practicable. This may include providing space for outdoor seating, additional soft landscaping and other measures to support social activities and new land uses.

Any revisions to the street design should coordinate with new building accesses and changes in pedestrian behaviour.

Street furniture should be relocated and merged where appropriate and respond to the new character of the development where appropriate.

Figure 79: More London's active frontages are supported with seating, planting and water features

Street improvements

Where building heights are increased, there will likely be greater pedestrian flows to and from the development. This may provide justification for increased footway widths, cycle parking and new crossing facilities.

New buildings may provide additional opportunities to enhance the public realm through integrated facilities such as mounted lighting as part of the architecture, relocated street furniture, and enhanced wayfinding.

New buildings will likely require additional cycle parking to support the development. Designers should check building plans and internal parking facilities to establish whether additional cycle parking is required at street level. For further information about requirements on the TLRN, please contact our Borough Planning team by email at **boroughplanning@tfl.gov.uk**

Additional information

Department for Transport:
Manual for Streets, 2007

Greater London Authority Economics:
Retail in London, 2006

Transport for London:
Transport assessment best practice: Guidance document, 2010

Existing forecourts

The building setback distance and front boundary treatments significantly affect the character of the streetscape. We encourage developers to carefully consider the adjacent footway material so that the transition is visually cohesive with the street.

Where a forecourt area is provided, developers are encouraged to use Streetscape Guidance's recommended materials, to provide a more cohesive high-quality finish that transitions seamlessly with the street.

When working on the TLRN, should developers wish to extend the forecourt material to the kerb edge, SDRG approval is required. Materials should be suitably robust, slip resistant and maintainable. We will generally assume the maintenance liability for surfaces which extend across the footway for approved exceptions to the streetscape palette, but only up to the private property boundary.

Surface material transitions

Where a surface material transition occurs from private forecourt to the boundary of an authority, developers are encouraged to relate the forecourt surface treatment to the existing paving orientation and/or the surrounding paving module size.

Generally the existing paving will align with the kerb edge and so any new paving should intersect the building frontage at right angles if the building line is parallel to the kerb edge, providing a clean aesthetic.

Where a distinct change in surface paving is proposed, developers should terminate the paving at an agreed location on or adjacent to the boundary, such that the materials transition along a straight edge.

Figure 80: More London's paving extends to the kerb and is successful due to its attention to detail

Developers and the highways authority should agree an exact boundary point where the paving transition will occur to best accommodate the existing footway materials and avoid creating narrow fragments of paving and/or extensive areas of footway resurfacing.

Should the change in paving material not align with the public/private interface, metal studs no greater than six millimetres in height, can be used to outline the boundary.

New access arrangements

Additional footway crossovers may be required where new developments propose a change in access and servicing arrangements.

When working on the TLRN, new footway crossovers need to be approved by us and will be implemented at the cost of the adjoining landowner. Removal of defunct crossovers on the TLRN will be delivered by ourselves.

Additional information

Department for Transport:
Manual for Streets, 2007

Greater London Authority Economics:
Retail in London, 2006

7.4 Footway crossovers

Footway crossovers provide an entry point for motor vehicles to private land. They can be considered an intrusion by vehicles into pedestrian space and can have a detrimental impact on the streetscape if they disrupt the continuity and comfort of the footway. Designers should consider the impact of crossovers on pedestrian experience and ensure that they maintain ease of passage for wheelchair users.

Design

Footway crossovers take one of two forms, light crossovers and heavy crossovers.

Light crossovers are used to access a property with a low level use, such as a house. Light crossovers should provide restricted access to cars or light vehicles. They should provide a continuous footway surface for the crossover with a dropped kerb.

Heavy crossovers are used by heavy goods vehicles (HGVs) for deliveries and servicing requirements. A continuous footway surface is preferable which should be suitably robust. This may require using the same material but in smaller or deeper set paving units. Designers may delineate the crossover with flush kerb treatments or in exceptional circumstances, a change of material to setts or asphalt provided

that there is not a series of heavy crossovers in close proximity.

Good practice

- Tactile paving either side of the crossover is not required but may be recommended in some circumstances
- Sightlines should be kept clear for motorists to see pedestrians on the footway and give way accordingly. Access gates to private land must not open on to the public highway as they reduce sightlines and create a physical obstruction
- Surfacing should match that of the surrounding footway for light crossovers
- Generally, the ramp to the dropped kerb should not extend across the full width of the footway, but only sufficient to accommodate a suitable gradient of 1:12 and the transition kerbs. Where the footway is too narrow for such an approach, the whole width of the footway should be partially lowered for the crossover, such that a level area of footway is achieved with a constant gradient from back of footway to carriageway level
- When an existing crossover becomes redundant through changes in access arrangements to the private land, the developer or land owner will need to remove the crossover and reinstate the footway and kerb alignment through a Section 278 Agreement, without charge to the authority

Heavy crossover using setts and quadrant kerbs

The construction of crossovers should accommodate the magnitude of loading when vehicles cross the footway. The width of the dropped kerb and crossover should enable vehicles to pass without mounting the surrounding footway.

Surface runoff from the carriageway should not pool at the crossover or enter private land. Footway crossovers should not be located within bus stop cages, car parking or loading bays.

Crossovers are to be constructed in accordance with section 184 of the Highways Act 1980.

Figure 81: Heavy vehicle crossover

Design standards	
Typical width	2,400-3,000mm
Kerb upstand height from bottom of dropped kerb to carriageway	25mm
Minimum distance for crossover edge from street furniture	800mm
Gradient to dropped kerb	Maximum 1:12 Maximum 1:40

Planning

New footway crossovers require planning permission and may be requested by the adjacent landowner to the planning and highway authority. The authority will consider the impact of any proposed crossover on safety and free flow of traffic, as well as visibility and proximity to junctions and street furniture, among other considerations outlined in the Highways Act 1980, and will then decide whether to accept or modify the proposal. For work on the TLRN, please contact Borough Planning by emailing **boroughplanning@tfl.gov.uk**

The crossover is part of the public highway and does not give the occupier of the premises any particular rights, except to gain access to their property with a private motor vehicle.

The general presumption is to refuse an application if there is a conflict with a street tree.

If works are agreed they will usually be undertaken at the expense of the landowner, including the cost for footway strengthening and street furniture relocation. The authority is responsible for subsequent maintenance.

Additional information

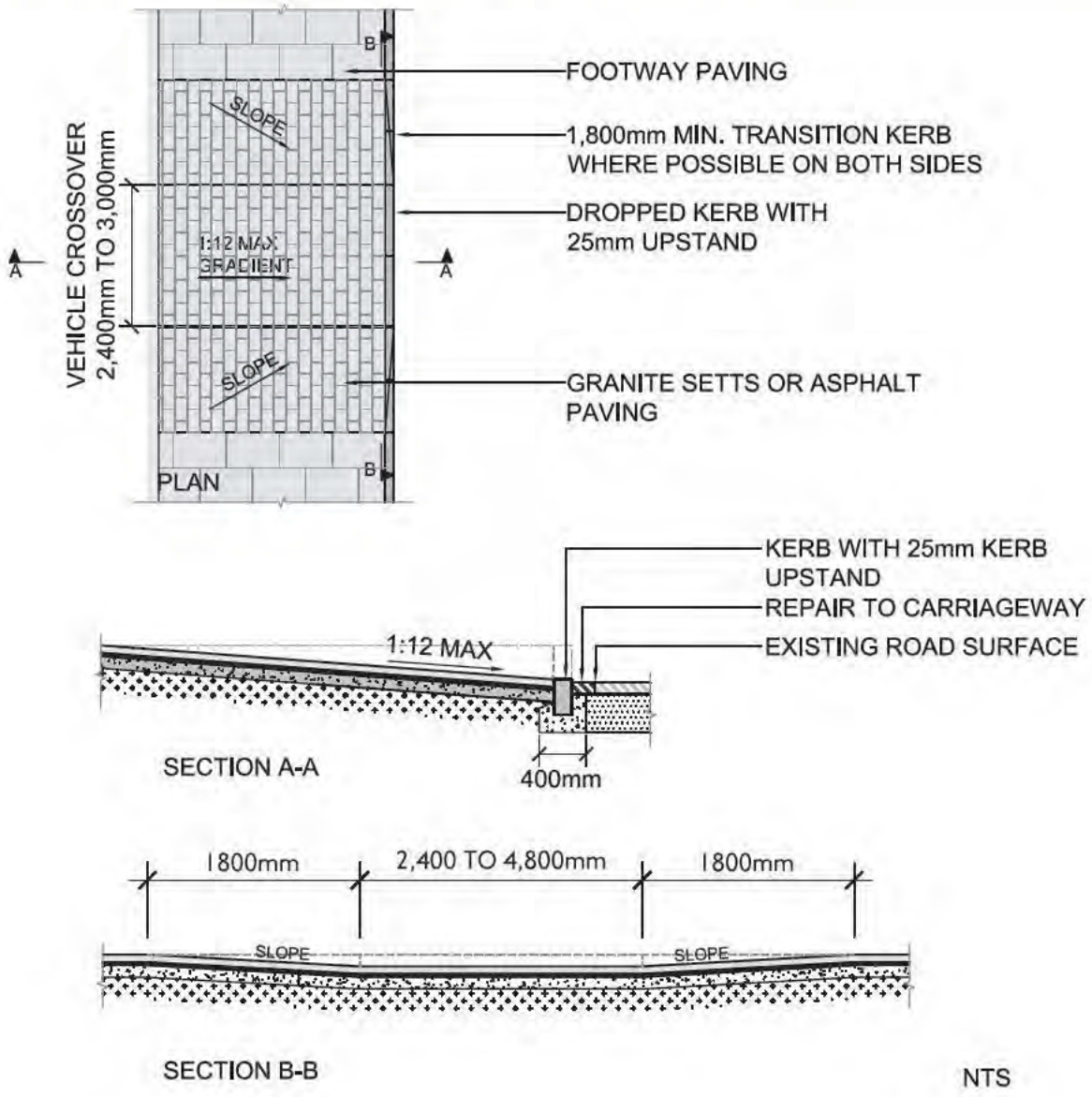
Legislation:

Highway Authorities, Highways Act 1980

Department for Transport:

Inclusive mobility – A guide to best practice on access to pedestrian and transport infrastructure, 2021

Figure 82: Domestic vehicle crossover in paved footway – Option 1

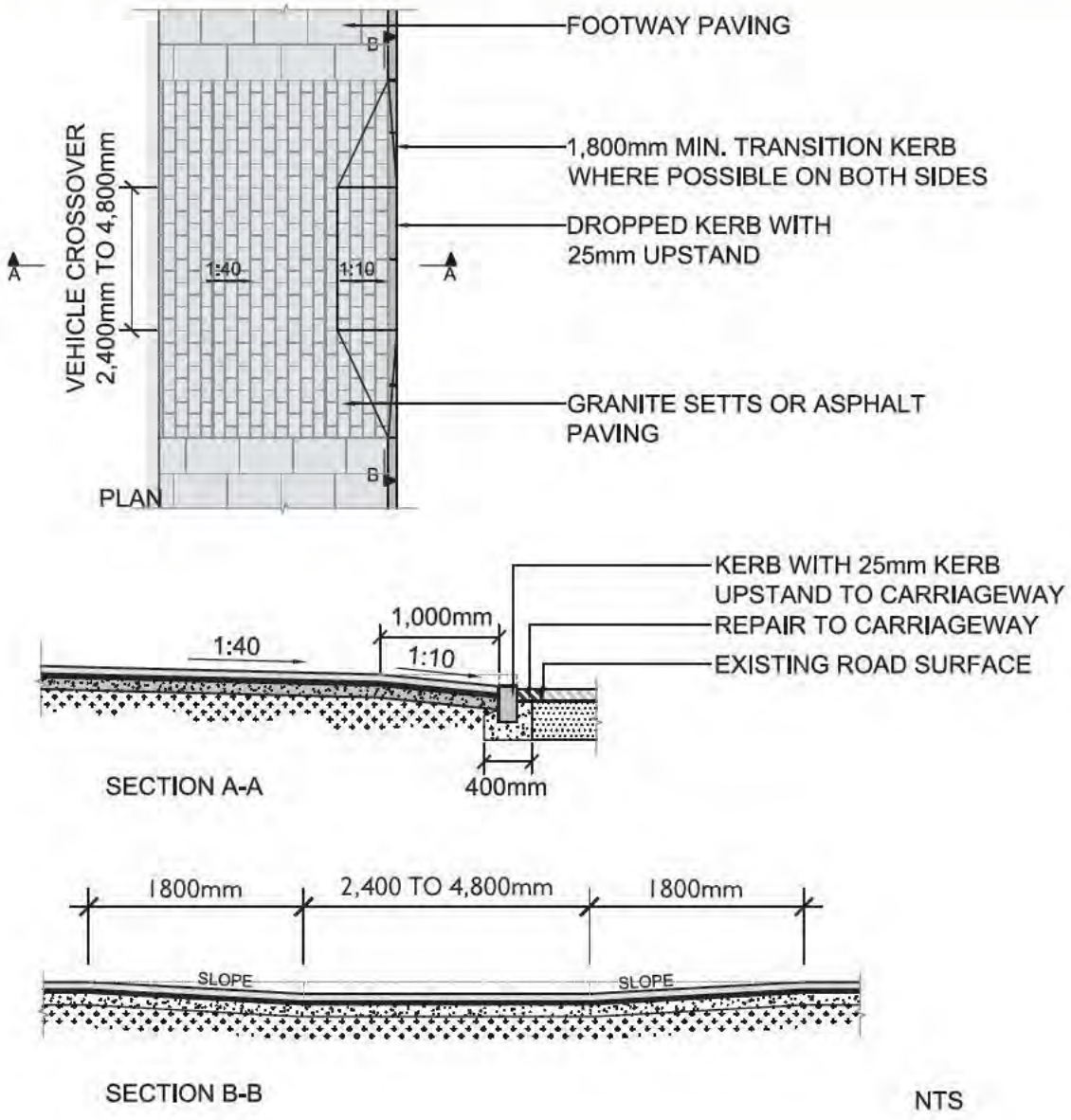


NTS

NOTES

1. Crossovers can be constructed using asphalt, setts or blocks. Material selection should be in keeping with the context.
2. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

Figure 83: Domestic vehicle crossover in paved footway – Option 2



NTS

NOTES

1. Crossovers can be constructed using asphalt, setts or blocks. Material selection should be in keeping with the context.
2. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

7.5 Inspection covers

Access chambers, inspection chambers and manholes, often collectively referred to as ironwork, are located across the highway to provide varying degrees of access to underground utilities. Inspection covers at the surface can be unsightly, especially when located on footways, as they can fragment the visual continuity of paving materials.

Placement

Ironwork should be positioned in a location that minimises visual disruption. When creating new streetscapes, it is important to liaise with utility companies to explore all opportunities for achieving this.

The utility company generally predetermines the location of ironwork to best satisfy servicing requirements.

The following points should be considered when determining the placement of an inspection cover:

- All inspection covers and frames should be to the appropriate strength rating to ensure that they do not "fail" under the expected loading conditions. These strength ratings are laid down in BS EN 124. In footways the normal strength rating would be B125
- Inset covers are only mandatory by TfL in tactile paving areas. Although not mandatory by TfL there may, in some instances, be a desire to use inset covers to achieve a more homogeneous footway surface finish. In these situations the designers should contact the utility companies concerned to ascertain their requirements. In some cases special types of covers may be specified with or without identification markings
- A highway authority can arrange for a utility company to relocate the access point in certain circumstances, however, this can be very expensive
- There is usually a small degree of flexibility for altering the orientation of ironwork within footways. Design teams should seek to align the orientation of the edges of a cover, where possible, with that of the pointing employed on rigid footway surfaces
- Care should be taken to ensure that access to chamber covers is not impeded with the addition of any new item of street furniture
- For new chambers, such as for traffic signal ductwork, the cover should be positioned in as inconspicuous a position as possible, and ideally aligned to the modular paving layout
- In high security areas, inspection covers may need to be marked. Advice should be sought from our transport community safety managers within the Community Safety, Enforcement and Policing directorate
- Some utility companies have bespoke labelled covers and inset covers – determine this by asking the utility company
- Inspection covers that are required to do so should have ventilation

Inset covers

Inset covers are composed of a recessed tray and frame, which can accommodate paving materials to match the surrounding palette and help hide the presence of ironwork. Inset covers are not mandatory; decide on a case-by-case basis whether they are appropriate for each location.

The cost of providing an inset cover will need to be part of the associated scheme costs and its maintenance will be borne by the highways authority. Contact the utility company well in advance so they can provide details of the covers that will need replacement.

Utility companies need to be consulted to approve the use of inset covers. At present

Figure 84: Granite tactile paving inset into an inspection cover

British Telecom and TfL ironwork can be finished with an inset cover.

Recessed fire hydrant covers should not be inlaid with paving materials as they need to remain visible for safety reasons.

Attention should be given to the detailing around the covers to ensure that footway surfaces abut the frame and to avoid unsightly cement infill.

Surface materials

We prioritise the use of inset covers in areas where high quality surfacing is provided in the form of natural stone and for areas of tactile paving.

Careful detailing should ensure that the inset cover matches the surrounding cuts and scale of the adjoining materials. This can include where different materials interface across the cover so that the inset cover is composed of both materials. On tactile surfaces, the detailing must ensure that the blister is orientated consistently across the inset cover and adjoining paving.

Any treatment which draws attention to the inspection cover should be avoided; do not use a different inset material to the surroundings, and do not provide a band of blocks around the inspection cover.

We recommend the use of deep frames and trays to enable a greater range of material depths to be used and help ensure consistency with footway surface materials. The depth of the inset cover must be sufficient for the proposed paving and bedding materials.

Where level changes occur in close proximity to the inspection cover, common at dropped kerbs, careful consideration should be given as to where surrounding materials are cut and folded. Ironwork cannot include a fold across the unit and therefore the surrounding surfaces need to be treated such that a new cut line may be introduced, or a more gradual change in levels detailed around the inspection cover.

Figure 85: Paving pattern inset into an inspection cover

Figure 86: Tactile paving inset into an inspection cover with blisters orientated consistently

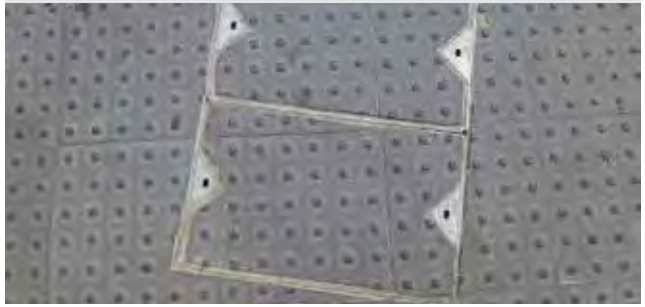
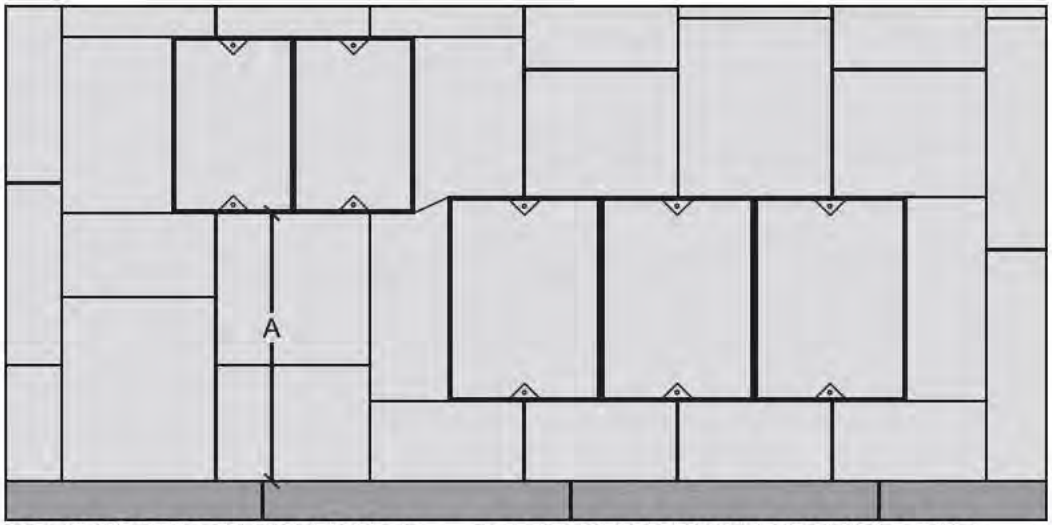
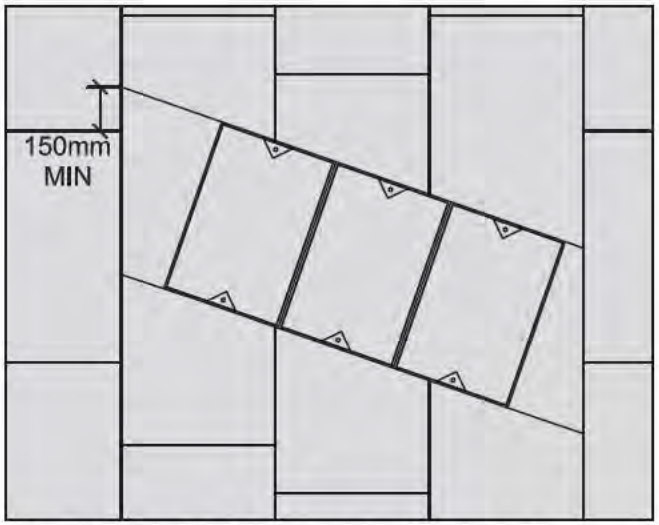


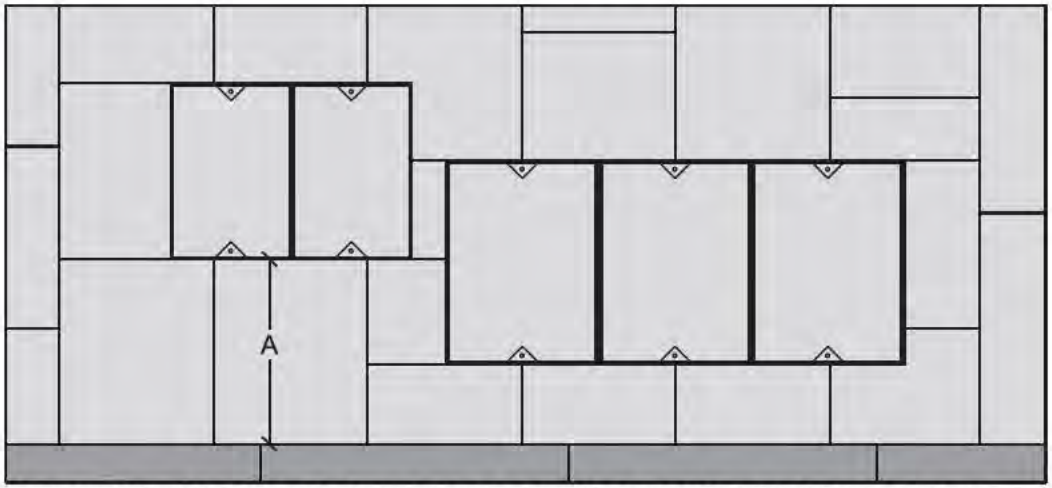
Figure 87: Utility cover arrangements in paving



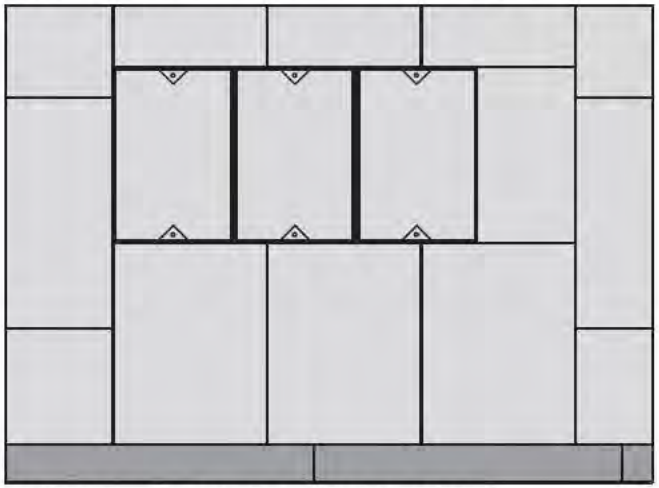
WHEN 'A' IS GREATER THAN 900mm SLABS TO ALIGN WITH EXISTING BOND



UTILITY COVER NOT IN LINE WITH PAVING

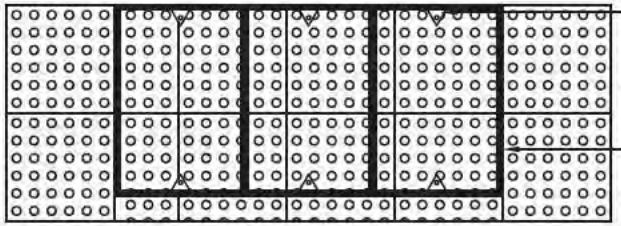


WHEN 'A' IS LESS THAN 900mm SLABS DO NOT ALIGN WITH EXISTING BOND



UTILITY COVER IN LINE WITH PAVING

Figure 88: Utility cover arrangements in blister paving



PLAN

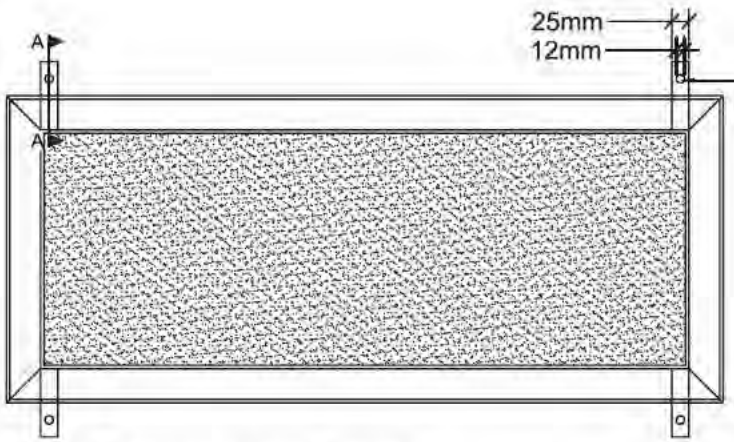
TYPICAL CLEAR OPENING CHAMBER SIZE	NUMBER OF COVERS	TYPICAL INDIVIDUAL COVER SIZE
725 X 225	1	785 X 315
915 X 445	2	485 X 505
610 X 610	2	333 X 670
1,310 X 610	3	454 X 670
1,690 X 710	5	347 X 770
2,285 X 710	6	388 X 770

THE NUMBER OF COVERS ON OTHER SIZED CHAMBERS TO BE COMPATIBLE WITH THE ABOVE TABLE TO ALLOW FOR ONE MAN LIFT OF THE COVERS

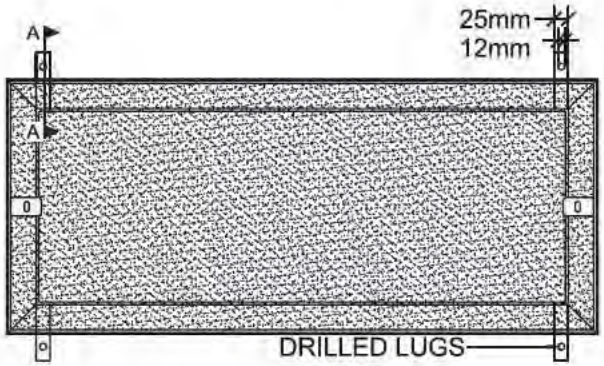
NOTES:

1. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied by utility company at each location.
2. All frames and covers to be to BSEN124-1 and constructed using min. 6mm thick structural steel plate formed to the required profile.
3. All steel frames and covers to be hot dipped galvanised after manufacture to BSENISO1461:2009.
4. Covers should be to the correct strength in accordance with BSEN124-1. In footways the normal strength requirement is "B125".

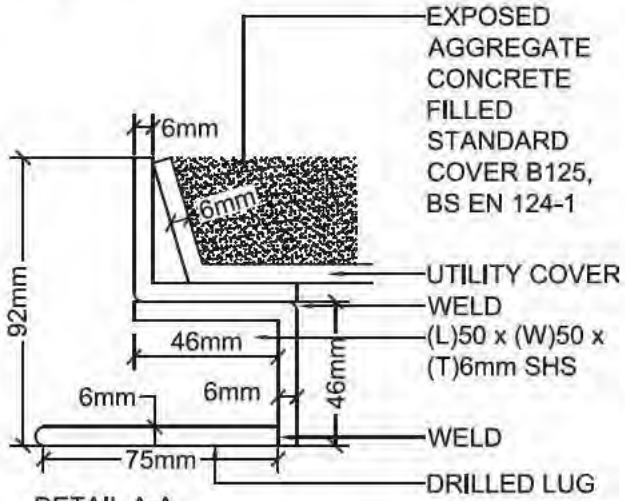
Figure 89: Deep type frame for utility access covers – water mains, EL, CT



UTILITY ACCESS COVER A - PLAN



UTILITY ACCESS COVER B - PLAN

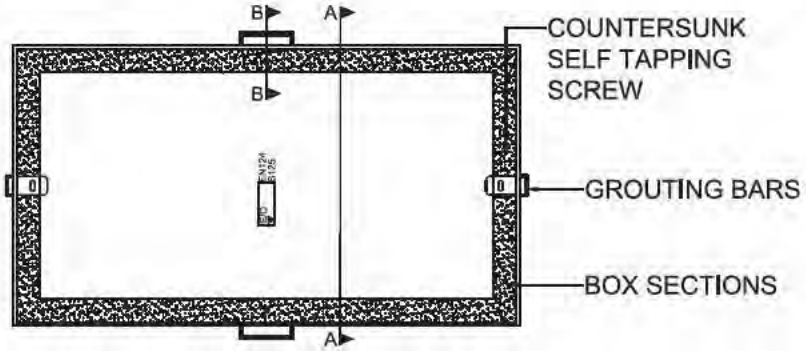


DETAIL A-A

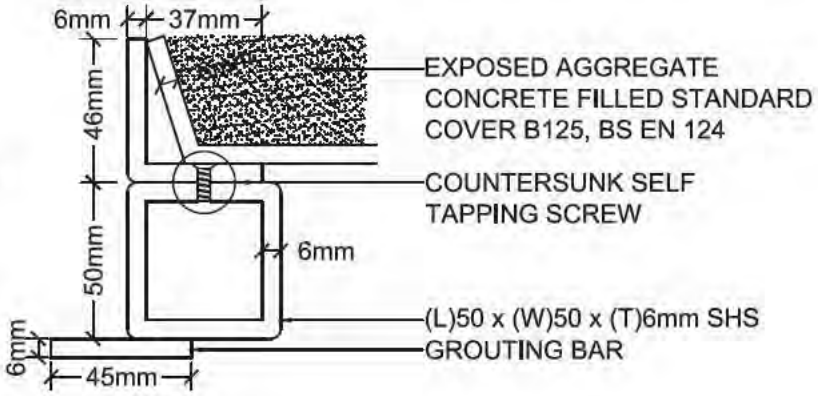
Notes

1. The deep frame allows close butting up to the frame of adjoining materials.
2. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.
3. Existing chamber walls may require lowering to accommodate the deeper frame. Where this is necessary a line of bricks is to be removed and the chamber wall rebuilt. The frame should be flush and must abut surrounding paving flags.
4. All frames and covers to be min. 6mm thick cast structural steel plate to BS EN 124-1 formed to required profile and welded using co_2 process.
5. All frames and covers to be hot dipped galvanised after manufacture to BS 729:1995.
6. Bespoke covers from utility companies shall be provided.
7. After brushing in of sand, all covers shall be lifted, and sand between the covers and frame removed to ensure future ease of access. The covers shall then be re-fitted.
8. Six sets of lifting keys to be provided to engineer.
9. All work must be carried out in compliance with the requirements of the Manual Handling Operations Regulations 1992 (as amended in 2002).

Figure 90: Deep type frame for utility access covers – water mains, EL, CT



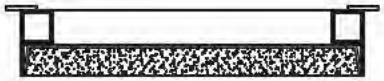
UTILITY ACCESS COVER FOR BRITISH TELECOM - PLAN



DETAIL B-B

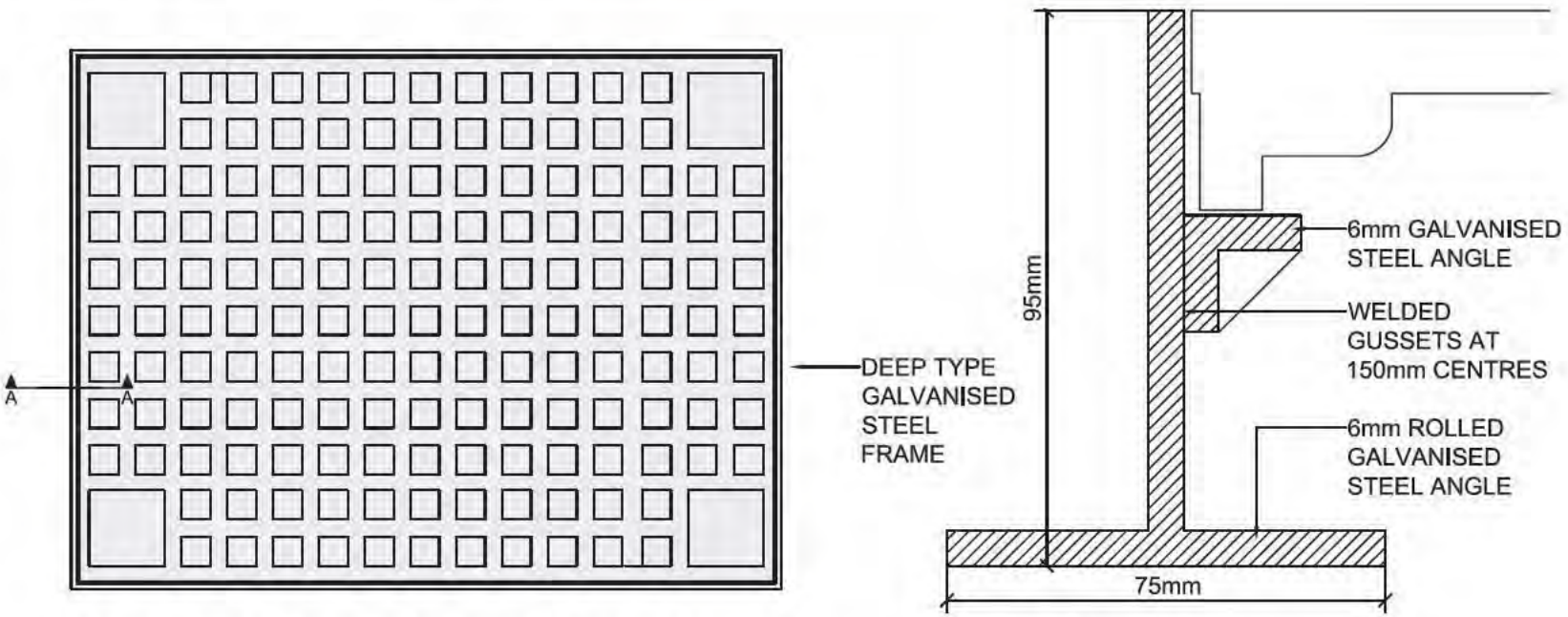
NOTES

1. The deep frame allows close butting up to the frame of adjoining materials.
2. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.
3. Existing chamber walls may require lowering to accommodate the deeper frame. Where this is necessary a line of bricks is to be removed and the chamber wall rebuilt. The frame should be flush and must abut surrounding paving flags.
4. All frames and covers to be min. 6mm thick cast structural steel plate to BS EN 124-1 formed to required profile and welded using CO_2 process.
5. All frames and covers to be hot dipped galvanised after manufacture to BS 729:1995.
11. Bespoke covers from utility companies shall be provided.
12. After brushing in of sand, all covers shall be lifted, and sand between the covers and frame removed to ensure future ease of access. The covers shall then be re-fitted.
13. Six sets of lifting keys to be provided to engineer.
14. All work must be carried out in compliance with the requirements of the Manual Handling Operations Regulations 1992 (as amended in 2002).



DETAIL A-A

Figure 91: Deep type frame for utility access covers – TfL



DEEP TYPE FRAME FOR UTILITY ACCESS COVERS - PLAN

DETAIL A-A

Notes

1. The deep frame allows close butting up to the frame of adjoining material.
2. Existing chamber to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.
3. Existing chambers walls may require lowering to accommodate the deeper frame. Where this is necessary a line of bricks is to be removed and the chamber wall rebuilt. The frame should be flush and must abut surrounding paving flags.
4. Strength class to suit location of cover in accordance with BSEN124-1.
5. All frames to be to BSEN124-1 and constructed using min. 6mm thick structural steel plate to BS formed to the required profile.
6. All steel frames and covers to be hot dipped galvanised after manufacture to BSENISO1461:2009.

Maintenance

Deep frame construction

- Inset covers that do not have a deep frame or edge restraint will not have the same load bearing capacity as the rest of the footway
- Where multiple inspection covers are arranged in a row, maintenance works should ensure that the covers are not swapped over, as any carefully detailed layout will become misaligned
- External edges of the tray should be lubricated with a non-setting petroleum jelly to avoid the tray becoming stuck in the frame
- Failure as a result of shallow inset materials

Ownership

Utility companies own the majority of ironwork that appears on the public highway and are responsible for the maintenance of their inspection covers. A small proportion are owned by the highway authority and these relate to traffic signalling, drainage and CCTV surveillance equipment. Where the highway authority replaces the utility company standard cover with a bespoke inset cover, the highway authority assumes the maintenance responsibility for that cover.

Additional information

Legislation:

New Roads and Street Works Act 1991

British Standards:

BS 7903: Guide to selection and use of gully tops and manhole covers for installation within the highway

BS EN 124: Gully tops and manhole tops for vehicular and pedestrian areas

7.6 Smoke vents

Smoke vents allow the fire brigade to vent smoke from basements by breaking the panels. Vents are generally located on private land belonging to the building they serve. There may be circumstances in which vents need to be located in the adopted highway, usually by grant of an undersailing licence. Permission must be sought from ourselves for any works below, above or on the TLRN, including the proposed introduction of any new smoke vents.

Performance criteria

Smoke vents should be slip resistant and sufficiently robust to meet appropriate loadings, as well as performing their intended fire safety function.

Vents should be flush with the footway surface and may be delineated with metal studs.

Responsibility

Where smoke vents are within the adopted highway, footway maintenance lies with the highway authority. Responsibility for repair of the smoke vent lies with the property owner.

Figure 92: A smoke vent demarcated with studs and an inscribed metal plate

7.7 Kerbs

Kerbs provide an important visual and physical delineation between footway and carriageway.

We advise using a limited material palette for kerbs, providing a clear and consistent aesthetic for all street types.

Kerb unit sizes, profiles and options vary significantly between different suppliers, so the Streetscape Guidance focuses on the key aspects of performance which are required on the TLRN. The core criteria are:

- To use a consistent material palette
- To enhance safety and legibility by providing an appropriate degree of carriageway delineation
- To provide long-term durability and ease of maintenance

Figure 93: Granite kerb

- To offer inclusive facilities for all users
- To enable good drainage and surface water removal

Kerb materials

Kerbs can be provided in both granite and concrete. Both materials have benefits and drawbacks.

Granite kerbs are preferred for environments that:

- Have regular pedestrian movement
- Have low to moderate speeds
- Are in conservation areas or
- Have historic or civic significance
- Require a high quality finish, especially when combined with other natural stones or asphalt footways
- Where footways need to be emphasised or high pedestrian flows exist
- Where enhanced longevity of a scheme is required as granite has a longer life than concrete and can be reused

Concrete kerbs are preferred:

- In high speed environments where pedestrians are less likely to linger or spend time
- Where a kerb must be cast in place to suit the circumstance

The initial installation and material cost of concrete kerbs is relatively inexpensive, however, it does not tend to wear well over time.

Standard kerb dimensions

The kerb face or upstand height is important for delineating the boundary of the carriageway, providing a visible edge and drainage channel.

Kerb heights can have a profound impact on physical visibility and protection, as well as a perceptual impact on user behaviour. Lower kerbs are more conducive to informal pedestrian crossing but offer less physical protection from vehicles and can prove difficult for those with visual impairments to navigate.

Dropped kerbs offer convenient, step-free access and are especially beneficial for users with impaired mobility, however, some users may experience discomfort if the gradient is too severe. Dropped kerbs should be provided with transition kerbs on the approach to provide a gentle gradient to a flush edge at carriageway level.

Figure 94: Southwark Street

Standard kerb dimensions on the TLRN

Application	Height above carriageway
Standard upstand height for conventional road layouts	125mm
Standard upstand height for bus stops	125-140mm
Suggested minimum kerb height for delineating footway and carriageway	60mm
Suggested minimum kerb height for delineating footway and cycle track Please note that the minimum kerb height between the cycle track and the carriageway is 125mm	50mm
Kerb upstand height from bottom of dropped kerb to carriageway	25mm
Upstand height for pedestrian crossings	0mm (ie flush); 6mm is the maximum allowance

Application	Width
Standard width	150mm
Conservation and bespoke width	300mm if laid horizontally; 200mm if laid vertically
Note: Kerbstones used in conservation areas have a rectangular (200x300mm) profile. They may be laid horizontally, giving a wide, shallow kerb, or vertically, giving a narrow, deep kerb	TfL prefers the use of 200mm width because this allows a height of 300mm, the majority of which is located below carriageway level, thus improving durability compared with shallower constructions (ie 175mm below carriageway compared with 75mm)

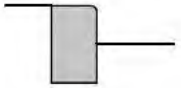
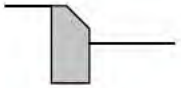
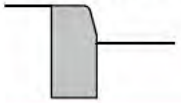
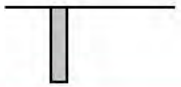
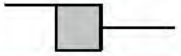
The physical limitations of pedestrians with mobility impairments should be considered when specifying kerb heights to ensure inclusive design standards are attained. The Accessibility Research Group's studies in 2009, at University College London (UCL), concluded that heights below 60mm could not be detected by some visually impaired users. It is recommended that should a shared space approach be employed, careful consideration of kerb heights is required based on the character of the road and the amount of activity.

Figure 95: A selection of kerbs on the TLRN

Standard TLRN kerb types

The following guidance outlines the suite of standard kerb types used on the TLRN. This list focuses on the significance of the kerb upstand height and kerb profile for fulfilling a range of different functions in the street environment.

It should be noted that for a typical kerb with an upstand of 125mm, the kerbstone will be approximately 300mm in total height as it will be bedded approximately 175mm below the carriageway surface. Dimensions stated are therefore not representative of the kerbstone size, but of the intended surface level aesthetic.

Kerb type	Profile options	Upstand height	Application
Standard straight kerbs	Bull-nosed 	Maximum: 140mm (bus stops and central reserves) Standard: 125mm From footway to cycle tracks: 60-70mm maximum Low: 25mm (crossover)	These kerbs can be laid on their wide or narrow side however laying on the wider side will increase the risk of dislodging from vehicles. A technical specialist should be consulted. Low sizes can be used in shared space settings, crossovers, or on-footway loading bay edge treatment as an option.
	45° splayed 	Variable	Used where vehicles may need to ride up on to the verge (ie in an emergency). Bespoke splayed transition kerbs are also used adjacent to designated cycle lanes to maximise the effective width of the lane (125mm upstand) although any other kerb with a maximum 60-70mm upstand fulfils the same purpose.
	Half-battered 	Variable	Used to notify motorists when they are too close to the edge of the carriageway. Footpath can be provided next to this kerb.
	Edging 	Flush	Flat topped edging laid on edge used to contain paving when transitioning from one material to another.
Kerbs for channels	Square edge 	Flush Can be laid on edge or laid flat based on requirements	Channel (normally laid flat). These kerbs can be used to delineate a raised table at an entry treatment (normally laid on edge).
Kerbs for corners	Radius 	Maximum: 140mm Standard: 125mm	To provide a smooth radius where the carriageway is turning. For corner radii greater than 15 metres, standard straight kerbs can be used interspersed with radius kerbs.

Kerb type	Profile options	Upstand height	Application
	Quadrant 	Variable (to match surrounding kerbs)	To provide a radiused kerb where otherwise there would be a right angled corner geometry. May be used at entry treatments, islands or refuges.
Transition kerbs	Transition 	Variable configurations to meet requirements	To transition from one level to another (ie a crossing). The kerb profile is angled to allow for a smooth transition from one kerb height to another without stepping down.
Safety and containment kerbs	High containment 	Variable	Carriageways (40mph or greater). For use as a high containment safety kerb.
	Bus access 	Maximum: 200mm Standard: 140mm	For use at bus stops – allows 50mm gap between bus and footway. Can be customised for different entry levels of public transport vehicles.

Radius and special shaped kerbs

Changes in kerb alignment should be smooth and detailed using radiused kerbs, not mitred.

Always refer to the outward facing kerb edge side of the radius: ie if the outer kerb profile is the long edge, refer to the external radius; if the kerb profile is the short edge, refer to the internal radius.

Bespoke special shaped kerbs may be ordered where a more robust kerb is required, for example, at narrow, busy side road entries which may be more susceptible to vehicle impact.

Containment kerbs may be considered for high speed settings where a clear visual edge and additional safety precautions are required to help contain vehicles within the carriageway and to discourage pedestrians from crossing.

At crossovers where the footway continues across an access to a driveway or garage, pedestrians are given full right of way, with preferably no change in footway height except adjacent to the carriageway. Kerb heights should be dropped and subbase construction detailed to a loading grade.

Figure 96: Splayed kerb on a cycle super highway