

Foreword

Enabling more people to walk more is vital for the future health of our city. The streets and places we are designing need to make walking an easy and attractive choice for all Londoners.

Every day more than 27 million trips are made in London. This includes six million walk-all-the-way trips and seven million walks of over five minutes as part of a longer journey. However, the proportion of people choosing to walk has been stagnant for several years and this has contributed to the inactivity crisis. By breaking down the barriers to walking, we will help to tackle the challenges of climate change, air pollution and congestion driven by over-dependency on private car use. We will also make travel in London safer and healthier for everyone.

Planning for walking is complex and no one approach fits all situations. Good planning requires an appreciation of how our whole urban system needs to be designed to encourage walking. Our streets and open spaces, the buildings that front onto these, and the transport hubs that support onward movement all contribute to making our city great for walking.

I am committed to elevating walking as the travel mode that binds all aspects of successful and healthy urban living. This document raises our ambition and, importantly, provides the tools for planning better environments for walking.

Will Norman
Walking and Cycling Commissioner



March 2020

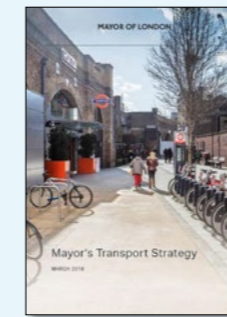
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Chapter 1 – Introduction

The Planning for Walking Toolkit is a handbook providing advice for planners and designers involved in the redesign or creation of public realm, including streets, off-road footpaths and public spaces across London. The document emphasises the importance of embedding good practice urban design principles in the planning and design process for all publically accessible parts of the city. It sets out these principles alongside recommended analytical tools to identify existing issues and set the vision for creating good environments for walking - from data collection through to supporting the development of the design brief.



Mayor's Transport Strategy

The Planning for Walking Toolkit links between the strategic vision set out in the Mayor's Transport Strategy and Walking Action Plan, and the detailed design guidance provided in Transport for London's Streetscape Guidance.



Walking Action Plan



The Planning for Walking Toolkit



Streetscape Guidance

This guide is intended to contribute towards creating a more walkable city, improving the experience for people using the public realm and enabling more active travel, by raising aspirations within the design brief. It does not create new design policy but instead references existing policy and design approaches to place a renewed emphasis on the importance of high quality places for walking.

Typical projects and interventions that fall within the remit of this document include:

- Refurbishing the urban realm
- Street clutter reduction

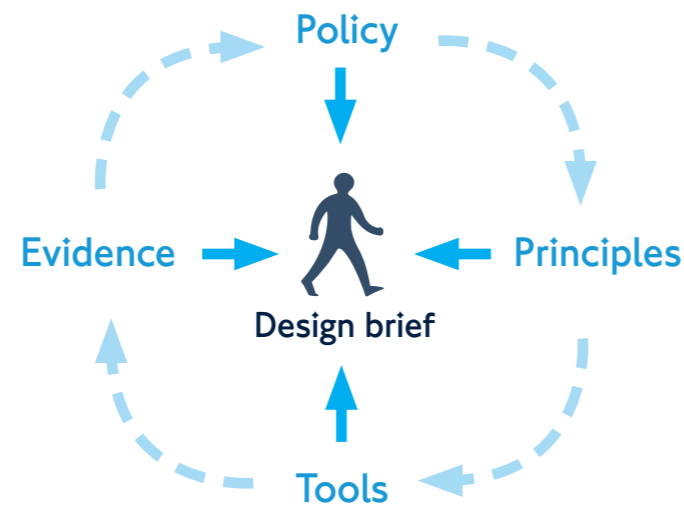
- Street furniture placement
- Wayfinding strategies
- Footway widening proposals
- Minor crossing improvements e.g. signal retiming
- Junction safety improvements
- Traffic management measures
- New uncontrolled crossings
- New non-signal controlled crossings
- New signal controlled crossings
- Grade separated facilities
- Major new developments
- New public spaces and links
- Area wide neighbourhood scale improvements



1.1 How to use this toolkit

The toolkit is structured to provide planners and designers with a list of options for collecting and assessing data that can then be used to inform design decisions which impact on the walking environment across urban streets, footpaths, open spaces and physically permeable buildings and structures where people are permitted to walk.

The document is laid out into four main chapters, and while some users may feel that particular sections are more relevant for their everyday role than others, some familiarity of each chapter is recommended to understand the wider context for good planning and design for walking.



Part A: Policy Context in London

Relevant policy objectives for walking are described up front to provide the context for ensuring a coordinated approach.

➔ To be referenced within a design brief as part of the scene setting for any project that looks to prioritise pedestrians.

Part B: Planning and Design Principles

This section includes recommended principles for ensuring good planning and design is embedded across the public realm. Seven key network design principles are defined, focusing on the needs of all pedestrians. Fundamental infrastructure recommendations are set out throughout, to clarify the physical implications of the design principles.

➔ To be used as a checklist for ensuring the design brief is written in a way that all aspects of the Pedestrian Network Design Principles are considered.

Part C: Planning and Design Tools

Tools for analysing walking environments are then presented, summarising the range of approaches available for identifying key issues for walking so that an evidence base can be assembled to inform a design brief and set out scheme priorities.

➔ To be used selectively throughout the design process and continue to shape the design brief as new information comes forward.

Part D: Case Studies

Case studies are then used to illustrate exemplary schemes where the Pedestrian Network Design Principles have been applied in practice.

➔ To provide examples and inspiration for raising the aspirations set out in the design brief.

1.2 Other related documents

This toolkit acts as a source book for a range of TfL developed tools and selected industry best practice techniques to assess the quality of the walking experience. The document is relevant for all streets in London, not just the Transport for London Road Network. Where a project intersects the TLRN or involves changes to signals, TfL Engineering assurance processes are required when developing project objectives.

The document does not provide an exhaustive list of analytical approaches – but it does look to highlight tools that are most relevant to the London context. It is designed to complement TfL’s suite of design guidance documents, known as the ‘Streets Toolkit’, and in particular relates closely to TfL’s Streetscape Guidance.

Once planners have used this document to identify key issues for walking, planned where to target improvements and written a design brief, detailed technical guidance can be referred to in Streetscape Guidance, as well as wider national

legislation such as The Traffic Signs Regulations and General Directions 2016, to develop concept designs.

Supplementary Planning Documents should also be referred to for localised street materials, with most local authorities having detailed context specific guidance for the design of the public realm.

The relationship to Streetscape Guidance is outlined below to show how these two documents are complementary but focus on different stages of the project life cycle.

Wider best practice literature has been used to inform this document and links to relevant sources of information and technical documents are provided alongside the main text.

[Click here for more details about the Streets toolkit.](#)

Table 1: The relationship of The Planning for Walking Toolkit and Streetscape Guidance

Project life cycle		Relationship of The Planning for Walking Toolkit and Streetscape Guidance	
TfL Pathway	RIBA Terminology	The Planning for Walking Toolkit	Streetscape Guidance
Stage 0	Strategic definition	✓	
Outcome Definition	Preparation and brief	✓	
Feasibility	Concept Design		✓
Concept Design	Developed Design		✓
Detailed Design	Technical Design		✓
Delivery	Construction		
Project Close	Handover and close out		
Post scheme monitoring	In use		✓

Part A. Policy Context in London



Chapter 2 – Aim and objectives

The aim of this document is to help people deliver the Mayor's vision for Healthy Streets in London by:

- Raising the aspiration to prioritise walking as part of all public realm design briefs to create improved conditions for pedestrians
- Referencing a range of tools for planners to respond to the local context and plan for better targeted improvements for walking
- Setting out design principles to ensure that public realm projects deliver comfortable, safe and enjoyable places, so that more people choose to walk as part of their daily routine.

What do we mean by 'walking'?

In the context of this document, 'people walking' refers to all pedestrians using the public realm including wheelchair users, people with buggies and users of mobility aids and mobility scooters, emphasising the need to design in an inclusive manner for all.

Walking activities can be subdivided as utility walking, including walking to work and accessing daily services as part of a regular routine; and recreational walking, as a more leisurely pursuit or in the form of faster paced walking or jogging as a more rigorous exercise routine.

People do not just move from A to B, but are likely to undertake a range of other activities as part of a walked trip including resting, standing and sitting; so these activities also need to be considered as part of planning and designing environments for walking that promote social interaction.

Most journeys involve walking at some point and so the public realm needs to be designed to enable walking, by making it a convenient part of an integrated transport system.

Good quality infrastructure does not in itself encourage walking if there is nothing to walk to or from.

Effective planning and design of the pedestrian network should facilitate people's ability and desire to access places by foot, while enabling the incidental social interactions and amenity value of a multi-functional, attractive place to shine through.



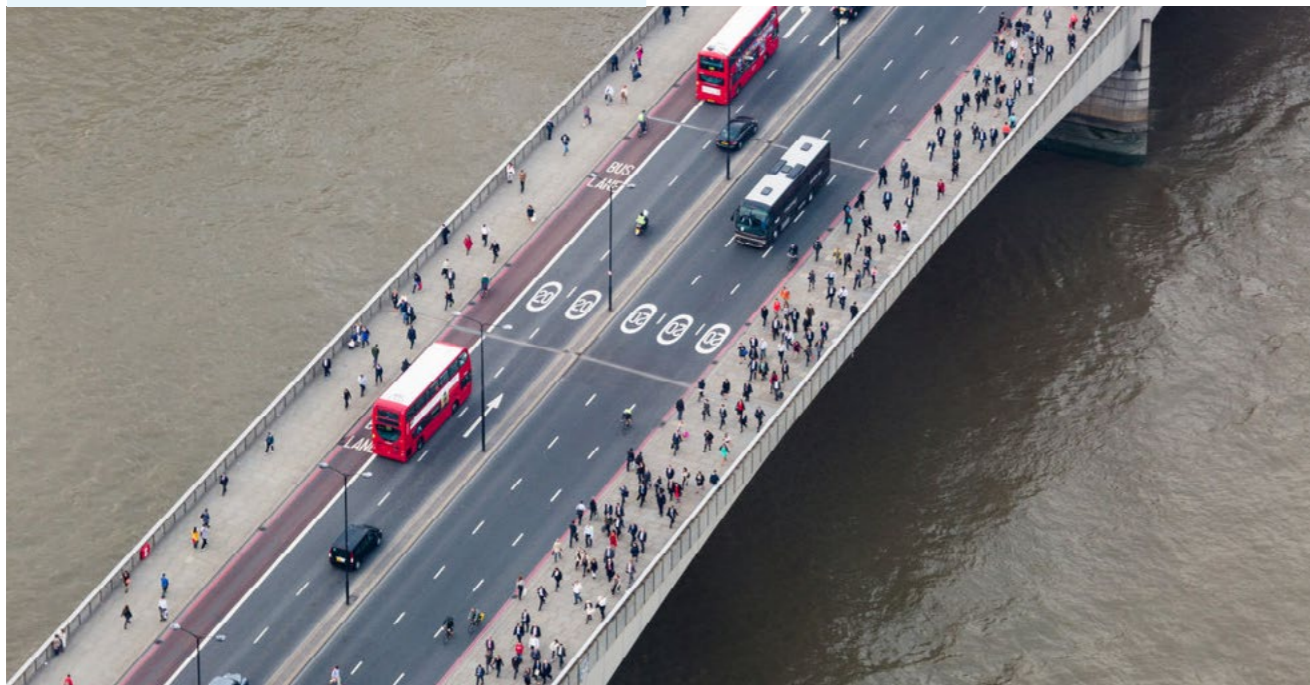
Walking as part of a connected journey

Public transport has a significant role to play in walking. Each day in London, 18 million walking journey stages are made as part of a longer trip by another mode. This adds to the six million trips that are made daily on foot from origin to destination.

Nearly all public transport trips include at least one walking journey stage, with people walking on average between four to 10 minutes to reach public transport. People walk more if they live in an area that has good public transport.

This is why it is important to consider walking at a city scale, as part of longer journeys, and ensure these journeys are coherent and consistent. Planners and designers should implement interventions that better connect areas to public transport, and consider what people need for that journey; for example by improving onward legibility or reducing severance around public transport links.

In many parts of central London, walking accounts for a greater proportion of through movement than motor traffic.



Walking for leisure

Half of all walked trips in London are currently made for leisure and shopping purposes. These trips take place not just on urban streets, but across all publically accessible footpaths, open spaces and permeable areas where people are permitted to walk. TfL customer research (2018) found that two thirds of Londoners say they would walk more if routes were improved. Continued investment in maintaining and improving the connectivity and quality of the walking network is therefore vital to ensure that walking becomes an increasingly attractive way to spend time.

The Walk London Network, made up of seven routes including the Thames Path and Capital Ring, is one of the largest signed urban walking networks in the world, and designed to be easily accessible by public transport. This network is not only used for leisure; more than 20 per cent of people using these routes are walking to work or accessing education. This highlights the multi-functional role that the pedestrian network plays and the importance of growing and enhancing the network to cater for both utility and recreational walking.

Working together

With more than 90 per cent of London's streets managed by London boroughs, it is important that a collaborative approach is embedded in all our delivery processes to ensure that we are working towards a shared vision of an accessible and inclusive walking network across the city. Partnership working across the public, private and community sectors is vital to create a cohesive walking environment.

Many of our partner organisations in London are already working collaboratively to achieve this. We will continue to work with the London boroughs, developers and land owners to provide tools, training, support and guidance to help them embed the Healthy Streets Approach in street design and borough policy-making, as well as across mixed-use development plans and regeneration projects. It will also be vital to continue working with the Metropolitan Police Service, who provide on-street law enforcement and education, to ensure that policies and proposals are joined up and fit for purpose.

We will work with businesses to highlight the wider benefits of the Healthy Streets Approach, identifying opportunities for improved freight management and localised public realm enhancement. We will also continue working with education and community partners on supporting measures and initiatives to promote walking, cycling and public transport use. Engagement with local communities will remain a fundamental part of the design process and projects need to build in community involvement throughout the life cycle of a scheme, so that streets are designed for the people that will use them.

Pop-up artwork celebrating local skills; regular short term installations give people additional reason to walk and get involved in the local community.



2.1 The Mayor’s Transport Strategy and The Healthy Streets Approach

The Mayor’s Transport Strategy (2018) sets out the Mayor’s vision for London’s transport system to 2041, which is centred on the Healthy Streets Approach; putting people, their health and their experience of daily life at the heart of transport planning and design.

The Healthy Streets Approach provides a framework to support high quality street design, focusing on delivering better, healthier outcomes for everyone. Our ambition is for all Londoners to enjoy the benefits of being active through walking or cycling for at least 20 minutes a day.

Using the Healthy Streets Approach as a framework, there is now a focus in London to:

- Prioritise walking, cycling and use of public transport to bring health and wellbeing benefits to everyone
- Provide a more appealing environment for walking, cycling and using public transport options, to reduce discretionary car use.



Three scales of delivery are required to fulfil these objectives:

i) At the city level

Planning for London’s rapid growth by better integrating transport modes that are linked by walking trips. Better understanding walking as part of connected trips is crucial for encouraging more walking, particularly in outer London.

ii) At the neighbourhood level

Planning for walking as part of area wide initiatives is vital so that people can access local amenities, employment zones and town centres by foot easily and conveniently. New developments should be designed for active travel and link with existing areas successfully.

iii) At the local place level

Designing high-quality environments with enough space for dwelling, walking, cycling and public transport use. Streets should be designed for people walking and reduce the dominance of motor vehicles. A well designed street has the potential to act as the stage for events and activities that will entice people out to shop, play and socialise.

Project proposals for improvements to the experience of walking should align with design objectives set out across each of these scales, to ensure that there is a continuity of design approach that is backed up by evidence.



The Healthy Streets Approach encourages the creation of places where people choose to walk and spend time.

2.2 The London Plan, Good Growth by Design and Inclusive London

The London Plan sets out the spatial development strategy for transport, environment, economic development, housing, culture and health across the capital. Policies T2 Healthy Streets and D7 Public realm reiterate the need to design streets that are of a high quality, in-keeping with the local context. Residential intensification in London is to be prioritised within a straight line distance of 800m from a Tube station, rail station or town centre, and this toolkit looks to support this process by identifying ways to assess the quality of the walkable catchment area.

In addition to the London Plan, the Good Growth by Design programme, advocated by the Mayor of London, is centred on the provision of people-oriented new developments: higher densities of housing, mixed land-uses, low-car use and permeable street networks to encourage walking. Inclusive London is the Mayor’s strategy for equality, diversity and inclusion across all aspects of urban living and the policies set out within this document must carry through in our approach to inclusive design across the public realm.



Creating walkable places – a redesigned open space in Woolwich within close proximity of the high street and rail station.



2.3 The Walking Action Plan

The Walking Action Plan sets out a spatial approach for delivering improvements to encourage walking by highlighting priorities across central, inner and outer London. Planners working out a design brief for a specific street should align design requirements with the following general spatial priorities where appropriate:



Central London

- Create attractive places that improve the experience of walking by using high quality materials and a careful consideration of the character of the area
- Target overcrowded and cluttered pavements, through streetscape decluttering and footway widening
- Facilitate improved interchange with public transport by locating crossings on desire lines and improving wayfinding signage



Inner London

- Improve walking access to high streets and town centres, by reducing severance over major roads through the upgrade or installation of new crossing facilities and creating more attractive walking routes
- Improve walking access to key transport hubs and strategic interchanges by enhancing the quality of the public realm and the space allocated for people to walk



Outer London

- Identify opportunities for new walking trips, by improving links to local amenities and services through area wide public realm enhancements
- Improve town centres and transport interchanges through the creation of multi-functional spaces for people walking and dwelling
- Reduce the impact of motor traffic on local streets and target routes to school by improving the attractiveness of walking routes.



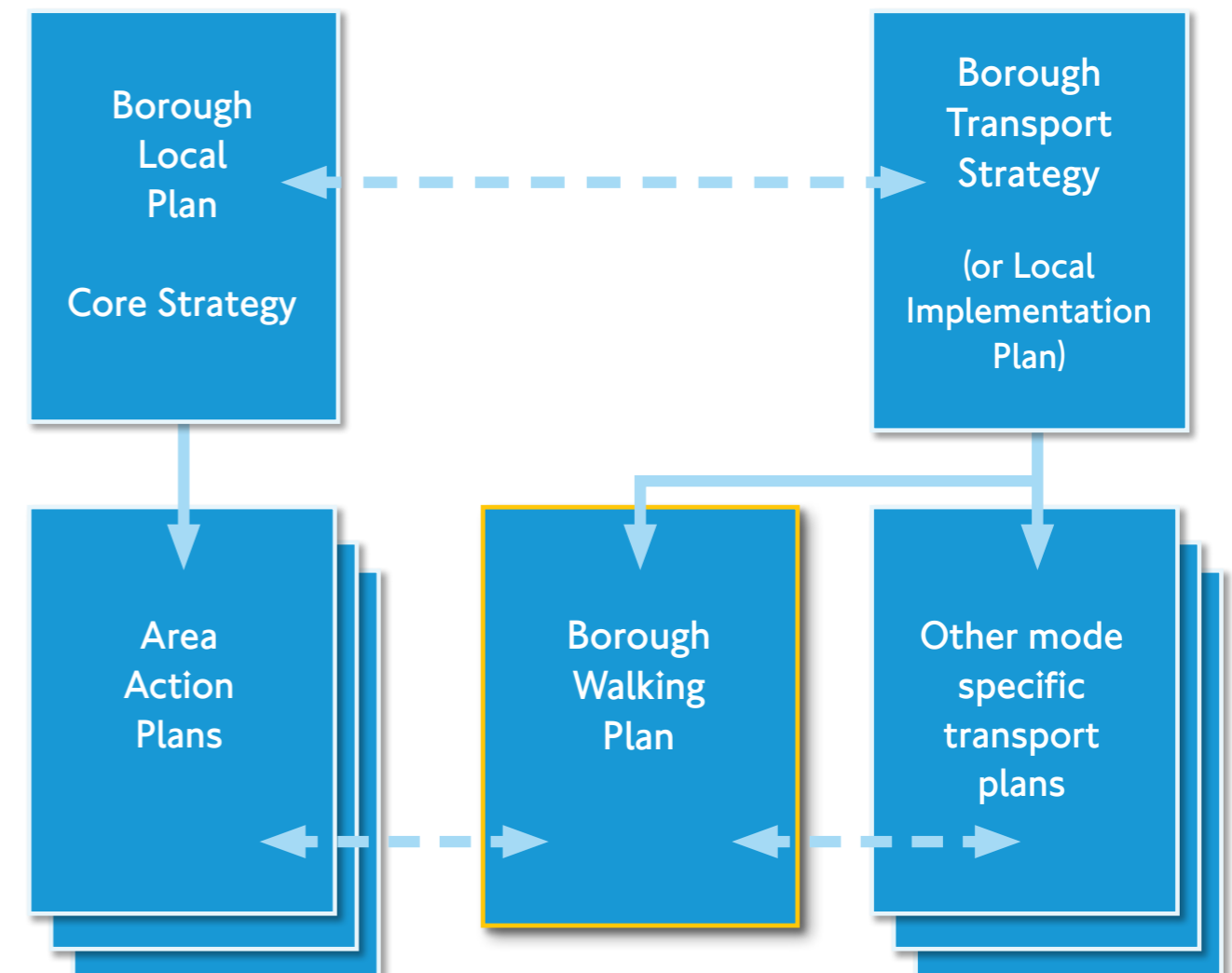
2.4 Borough and local area walking plans

Local authorities in London are encouraged to produce a local walking plan that sets out clear objectives for strategising public realm interventions that are based on the local characteristics and priorities of the borough.

It would be expected that a walking plan would consist of a vision statement and a target for increasing walking trips over a defined period of time that would lead in to a series of objectives with a clear list of demonstrable measures to gauge progress. These objectives would be rooted in a clear evidence base that demonstrates key issues for walking and relates development priorities to overcoming barriers to walking, while linking existing and planned trip attractors. Some of the city scale tools presented in Part C provide guidance for how this can be undertaken.

At a more detailed level, the local walking plan should, alongside supplementary Area Action Plans and Neighbourhood Plans, set out area based priorities, such as:

- improvements needed for links to schools and transport hubs
- mitigation of severance issues
- integration of new developments
- reduction of crime through improvements to natural surveillance
- increasing active frontage and land use mix
- maximising the connectivity and quality of local open green spaces and towpaths.



Part B. Planning & Design Principles

Chapter 3 – Pedestrian Network Design Principles

The pedestrian network comprises all publically accessible footways, footpaths, crossings, bridges, underpasses, open spaces and physically permeable buildings and structures where people are permitted to walk.

Designing the pedestrian network requires the consideration of several key principles that focus on the needs of all pedestrians. These principles should be utilised throughout the planning and design process and referred to collectively to anticipate the impact of design decisions on the pedestrian experience and to ensure the provision of a consistently high quality walking environment.

All schemes along the TLRN and TfL funded schemes on borough roads should be informed by these seven principles. The design principles should also be considered for use when planning dynamic changes to a street's function, such as for school street closures, occasional 'play streets' and regular street markets, where motor traffic is temporarily restricted.

Table 2: Pedestrian Network Design Principles

Safe	The public realm should be safe to use at all times of day and for people to feel safe to spend time in
Inclusive	All walking environments should adhere to the principles of inclusive design by ensuring that they are accessible to, and usable by, as many people as reasonably possible without the need for special adaptation or specialised design
Comfortable	Designated walking areas should allow unhindered movement for pedestrians by providing sufficient space
Direct	Facilities should be positioned to provide convenient links between major walking trip attractors
Legible	Features should be consistent and easy to understand for all pedestrians to know intuitively how to navigate within a space
Connected	Walking networks should have a high density of route options to suit pedestrians' needs
Attractive	Walking environments should be inviting for pedestrians to pass through or spend time in

An inclusive approach to planning and designing good environments for walking

All planners and designers of the street environment should seek to understand the role of inclusive design for creating streets and places that everyone can use. Inclusive design puts people at the centre of the design process, through engagement and considering the diversity of all people's needs.

Good street design will draw on local knowledge to enhance, protect and improve existing facilities. High quality streets should ensure that the needs of people walking can be met, accommodating existing daily routines and behaviours where appropriate.

Engaging a diverse cross-section of the community early in the design process is important to ensure that proposals meet the needs of local people, foster a sense of local ownership and encourage the uptake of walking. Engagement methods should be open and flexible to encourage participation across different groups and ages, and enable the co-production of places that communities want and need.

Community needs are often complex and relate to demographics, culture and economic aspects of a local area. Building an understanding of what people need is crucial for improving conditions that genuinely cater for those that will use the street most often.

A solid evidence base of local aspirations is needed to make good decisions that deliver on the equality duties that all public bodies have.

Pedestrian needs extend beyond physical capabilities, and include perceptual and subjective experiential factors such as personal safety and fear of crime. How people feel about an area is an important consideration when developing a design brief to minimise the perceptual barriers to walking and encourage greater uptake in active travel.

Some design approaches such as filtered permeability, whereby through motor traffic is reduced or removed entirely from a side road, can positively impact on multiple pedestrian network design principles with a single intervention.



Building a picture of the existing issues through data collection is fundamental to creating an effective design approach that responds to pedestrian needs.

Collaborative working is vital and design teams should:

- Develop a clear vision for all projects, no matter how small or large, drawing on local aspirations and engagement
- Think beyond the highway boundary by considering wider land use and the sense of place
- Be mindful of the dynamic nature of street environments and plan for how it performs throughout the day and night, and across the seasons, as well as for temporary uses
- Consider the seven Pedestrian Network Design Principles set out in the next section of this document, to ensure the delivery of a walking experience that is safe, inclusive, comfortable, direct, legible, connected and attractive.

Urban areas with trip attractors on all sides of a major junction benefit from having signal controlled pedestrian crossings on at least two arms of a signalised T-junction and three arms of a crossroads to ensure all footways can be accessed via a controlled crossing.



3.1 Safe

Reducing road danger is fundamental to ensuring London's streets are healthy places to walk and spend time. Fear of road traffic injury is one of the main reasons people give for not walking or cycling, and one that parents often give for restricting the independent mobility of their children. Design that mitigates safety issues is essential to ensure actual and perceptual improvements in safety across urban streets.

The speed of a vehicle is the single most influential determinant for a collision occurring as well as the severity of the collision. Reducing driving speeds is therefore critical for improving safety for people walking. TfL

Everyone has the right to travel on London's streets in complete safety and without fear. This is why the Mayor has set out his ambition to achieve Vision Zero – the elimination of death and serious injury from London's streets and public transport network by 2041. The Vision Zero Action Plan sets out the broad range of activities to eliminate road danger and achieve Vision Zero.

Peninsulation at Highbury Corner involved removing motor traffic from the arm of the roundabout where there are most pedestrians.



- Evaluating collision records at an existing location is important to prioritise design improvements and estimate how a new street design might perform, through the application of a Road Safety Audit.
- Where there is a trend for pedestrians to misread the level of risk at a particular location, such as crossing in between stationary vehicles across multiple lanes of traffic, design improvements should be sought to better accommodate pedestrians.
- Address tripping hazards through appropriate material selection, detailed design and construction quality control, with an ongoing programme of asset inspection and maintenance.

Click [here](#) to access the **Vision Zero Action Plan** for details on the multifaceted approach being employed by TfL to improve safety for all road users.

Click [here](#) to access TfL's toolkit of measures for reducing vehicle speeds in **Achieving Lower Speeds: the toolkit**.

Personal safety and security

'Safety' as a design principle also encapsulates personal safety and security issues, and the need to embed crime prevention and protective security strategies as part of the design.

Personal safety refers to the physical risk and psychological perception of experiencing a crime, both of which have a major impact on whether people choose to walk.

Designers should look to understand an offenders' point of view and how that relates to a particular place.

Crime prevention and protective security should be designed in from project inception and build on a strong evidence base that looks at existing conditions, current threat trends and user behaviours.

Different criminal and anti-social behaviours can impact on people and the public realm in different ways. Vandalism, graffiti, flyposting and skateboarding damages street furniture, which can increase the fear of crime (discouraging people to walk) and may encourage further damage (the 'broken windows' effect). Muggings also significantly increase the fear of crime and can discourage people from walking or going to a certain location.

While it is recognised that quiet streets and parks with low natural surveillance are vulnerable to crime, busier, more crowded areas can also be subject to opportunistic crimes, as the route may form part of a daily routine for an offender, with regular visibility of a vulnerable place. A site specific examination of security issues is therefore essential.

Designers should aim to recognise the existing vulnerabilities of the walking network and tackle these issues directly:

- Provide well-lit streets and paths without hidden corners, dead end routes or single access points, that will improve physical permeability and visual connectivity and encourage more walking and a greater pedestrian presence.
- Incorporate access prevention solutions to reduce the likelihood of offenders gaining access to unauthorised areas without overly impacting on the sense of place.
- Increase an offender's perception of risk in carrying out a crime by enhancing visibility of surveillance.
- In new developments, assess the extent of natural surveillance from windows and balconies and design for footways and footpaths to be overlooked by multiple properties.
- Street furniture should be designed to avoid encouraging anti-social use and vandalism, and should be positioned to minimise obstructing sightlines.
- If tree planting is to be included, trees should be positioned and maintained to ensure adequate lighting and natural surveillance potential.

3.2 Inclusive

TfL is committed to promoting the highest standards of inclusive design to meet our obligations under the Equality Act 2010 and ensure that we create safe, seamless and accessible end-to-end journeys for everyone.

When designing places for walking, it is crucial to recognise the diverse range of people who live, work and visit the Capital, and to accommodate their attributes and requirements through an understanding of diversity that includes and goes beyond those characteristics protected by the Equality Act 2010. All projects should have an **Equality Impact Assessment (EqIA)** undertaken to ensure that a Local Authority has met its Public Sector Equality Duty.

Some of the common issues in the public realm that can negatively impact on people protected by the Equality Act in relation to walking include (but are not limited to):

- Narrow footways with pinch points
- Insufficient time allocated on crossings
- Overcrowding
- Cobbled street surfacing
- Overly steep gradients to dropped kerbs
- Adverse cambers
- Non-standard footway delineation where there is a lack of a kerb upstand
- Feathered steps which lack adjacent tactile paving
- Chamfered kerbs which may be difficult to detect or unexpected
- Street clutter including 'A' boards
- Inadequate signage and wayfinding
- Limited seating
- Poor lighting
- Low level and/or poorly aligned obstacles
- Temporary closures, changes and alterations, especially where little or no advanced warning is given
- Excessive noise pollution
- Lack of toilets.

Providing sufficient space for a range of people with different mobility characteristics is fundamental for maintaining an inclusive public realm.



- Many people with visual impairments use regular street features such as kerb lines or tactile paving to navigate safely and these features should be provided consistently across the street environment.
- People with mobility impairments in particular require level surfaces and sufficient footway widths to pass along the street easily, with convenient public transport access provided.
- Consistency of materials and street layouts can assist in providing a reliable and predictable network for people with cognitive impairments.
- Older people may struggle to cross a signalised crossing at the designated 1.2m per second standard walking speed often assigned to signal timings, and consideration should be given to allow for additional time on busy pedestrian crossing phases.
- Young children usually start walking when they are around 0.8m in height; this creates potential safety issues relating to visibility. Unobstructed visibility at a height of 0.6m should be provided, by relocating street furniture such as litter bins, wherever there is a risk of children crossing informally, around schools or on the approach to formal crossings.
- Consider the potential for broadening the scope of a project to include additional amenities that can make a place more inclusive, such as planning for free drinking water fountains in areas with relatively high pedestrian densities, such as in town centres and at rail stations.
- Streetscape Guidance and TfL's internal SQA documents, set out TfL approved standards for infrastructure on the TLRN. Where non-standard arrangements are being considered, such as a continuous footway, it is important to consult those impacted and protected by the Equality Act.



3.3 Comfortable

Comfort covers a broad range of experiential factors relating to walking, directly related to our senses. Within the context of this document, the term primarily refers to spatial considerations, notably footway and footpath width relative to the pedestrian demand, and the sense of comfort from having sufficient space to make decisions on route choice.

It is also important to understand the range of other factors which influence user comfort on our streets including climatic factors such as temperature, humidity, solar and wind exposure, and motor traffic including noise and air pollution. These factors should be considered as part of the design process and can be assessed via a range of methods depending on the context, some of which are covered in section 6.2.3: Human scale analysis.

- To fulfil Pedestrian Comfort Guidance recommendations, footways, footpaths and crossings should be designed to maximise usable effective width by reducing clutter and improving physical pinch-points to offer footway clear widths of no less than 2.0m and crossing widths of no less than 2.4m (a preferred minimum of 3.2m applies at signal controlled crossings) with additional width provided based on pedestrian flows.
- Minimising pedestrian wait times at signal crossings, particularly where pedestrian flows are relatively high, can help to mitigate issues of overcrowding and discomfort at busy crossings.
- Design open spaces and sitting areas where microclimatic factors are favourable for dwelling and consider additional features or alternative routing provision where there is anticipated discomfort for people walking.

Widened footways adjacent to a new mixed-use development in Walthamstow.



3.4 Direct

Good public realm design should support direct movement for pedestrians to enable them to walk where they wish to go. Links that prioritise walking over other modes of transport enhance the relative convenience and attractiveness of walking.

Pedestrians tend to favour direct routes without deviation, changes in grade level or long waiting times at traffic signals. If directness and convenience is not provided for, it is likely that people will follow their own preferred desire lines. Where these considerations are not accommodated as part of the street layout, there may be an increased road safety risk for all road users, as well as the potential for damage to existing infrastructure from informal or unintended use.

To cater for desire lines it is necessary to understand pedestrian behaviour. Ad hoc observational studies can identify when a pedestrian desire line is not being met: an informal muddy path through a park can highlight a preferred route; forced gaps in hedgerows or broken fencing are evidence of issues in permeability; or other behavioural observations such as walking on the carriageway around footway obstructions.

Better accommodating pedestrian desire lines may include design interventions such as:

- Introducing or relocating controlled crossing points on desire lines.
- Replacing subways with at-grade crossings.
- Supporting informal crossing movements where deemed appropriate via the use of interventions such as traffic speed reduction measures.
- Formalising a footpath with new surfacing.

Failure to accommodate pedestrian desire lines can become a maintenance liability.



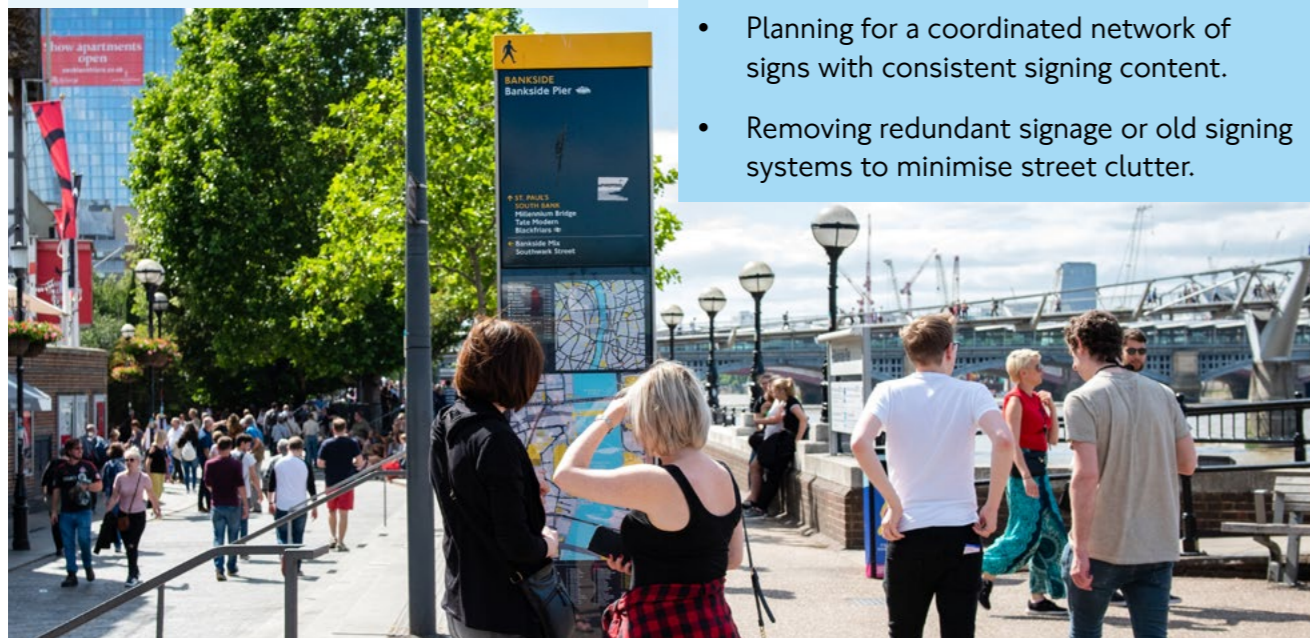
3.5 Legible

Legibility can be defined as the ease with which a walking route and its component features can be understood and navigated. Legibility relates to a consistency of application of readily identifiable features that are structured in such a way that they improve recognition. It is therefore important that street furniture and the arrangement of footways and paths are consistent and logical in their general arrangement.

Understanding of the architectural setting is equally important, requiring due consideration for the relationship, scale and distinctiveness of buildings to aid navigation. This should be supported with a consistent approach to signage including street name plates at all street corners.

Clear wayfinding signage is vital, particularly with regards to the content and the messaging so that people are presented with distinct points of arrival and a coherent progression of information is provided. A consistent wayfinding signage system, such as Legible London, should be considered as part of all town centre schemes and should be updated as appropriate.

'Heads up' orientation of the mapping system improves legibility where there are onward views.



Features of a street environment to enhance legibility include:

- Providing street furniture aligned in furniture zones.
- Using consistent surface materials and signage to communicate coherent messaging to users.
- Ensuring facilities are adequately lit and identifiable in different conditions.

Key design principles when planning good wayfinding systems include:

- Providing wayfinding where there are high pedestrian numbers in central London, inner and outer London town centres, transport hubs and tourist hotspots.
- Placing wayfinding signs at pedestrian decision making points, typically outside transport hubs, on key corridors, at junctions and route intersections.
- Positioning signs to be clearly seen, where they do not restrict or obstruct pedestrian flows and where they do not obstruct inter-visibility between drivers and pedestrians.
- Planning for a coordinated network of signs with consistent signing content.
- Removing redundant signage or old signing systems to minimise street clutter.

3.6 Connected

Connectivity relates to how well the pedestrian network provides multiple integrated routes to various destinations. Providing a high density of walking routes with a fine grain of connectivity makes walking the natural choice for completing multi-modal journeys.

Barriers to pedestrian movement including major roads, railways, topography, canals and rivers, can reduce local connectivity and sever one neighbourhood from another. Where barriers have existed for generations, development patterns may mean adjoining neighbourhoods have turned their backs on each other.

If a major destination lies close to a barrier for walking, there may be a strengthened case for overcoming it. Breaking this severance can help to open up suppressed demand for walking and should be prioritised where there is most potential for additional walking trips.

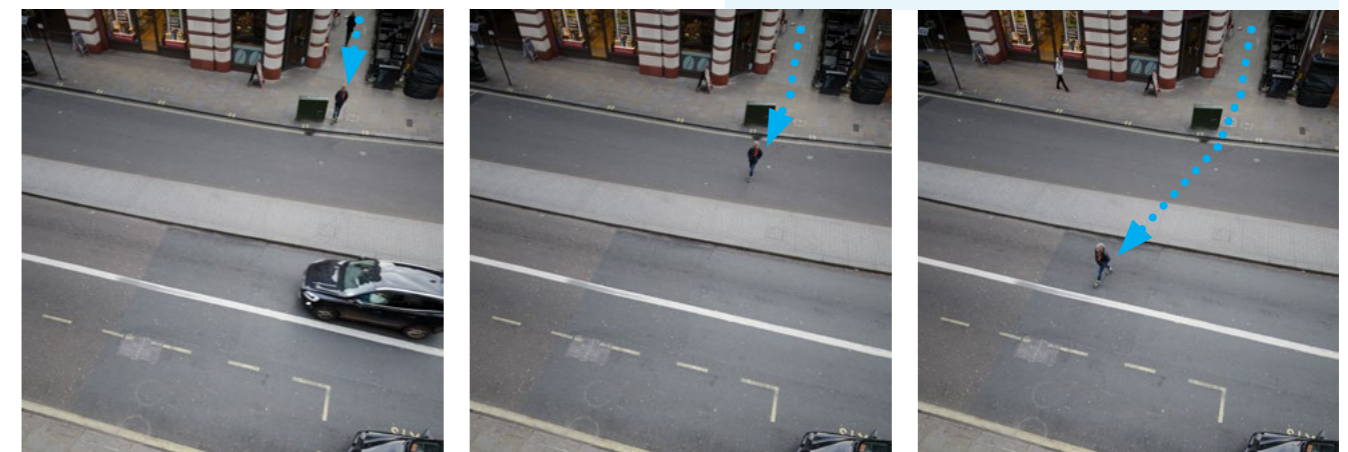
The type of severance as well as wider connectivity needs should inform whether an at-grade crossing or grade separated facility is provided.

Designers should think beyond the highway boundary to ensure that streets are considered as part of the wider area context. This includes considering where other pedestrian links, such as footpaths and towpaths, intersect the street and how new connections can best accommodate pedestrian desire lines.

Connectivity principles for walking should focus on how to:

- Overcome severance by coherently stitching urban areas together by connecting streets and spaces of contrasting use, importance, character and size.
- Provide controlled crossings that are convenient and link all sides of a major junction where the adjacent land use is conducive to walking.
- Provide a fine grained network to facilitate a choice of routes between different places and create an opportunity for variation in walking journeys.
- Plan for alternative routes where access restrictions are in place at night.
- Connect efficiently to wider transport networks designed to facilitate walking, cycling and public transport use.

Pedestrians emerging from alleyways will often choose to continue across the carriageway on that alignment. Informal crossing movements are not necessarily dangerous; however a formal crossing may be considered where there is especially high demand, to facilitate wider connectivity and safety benefits.



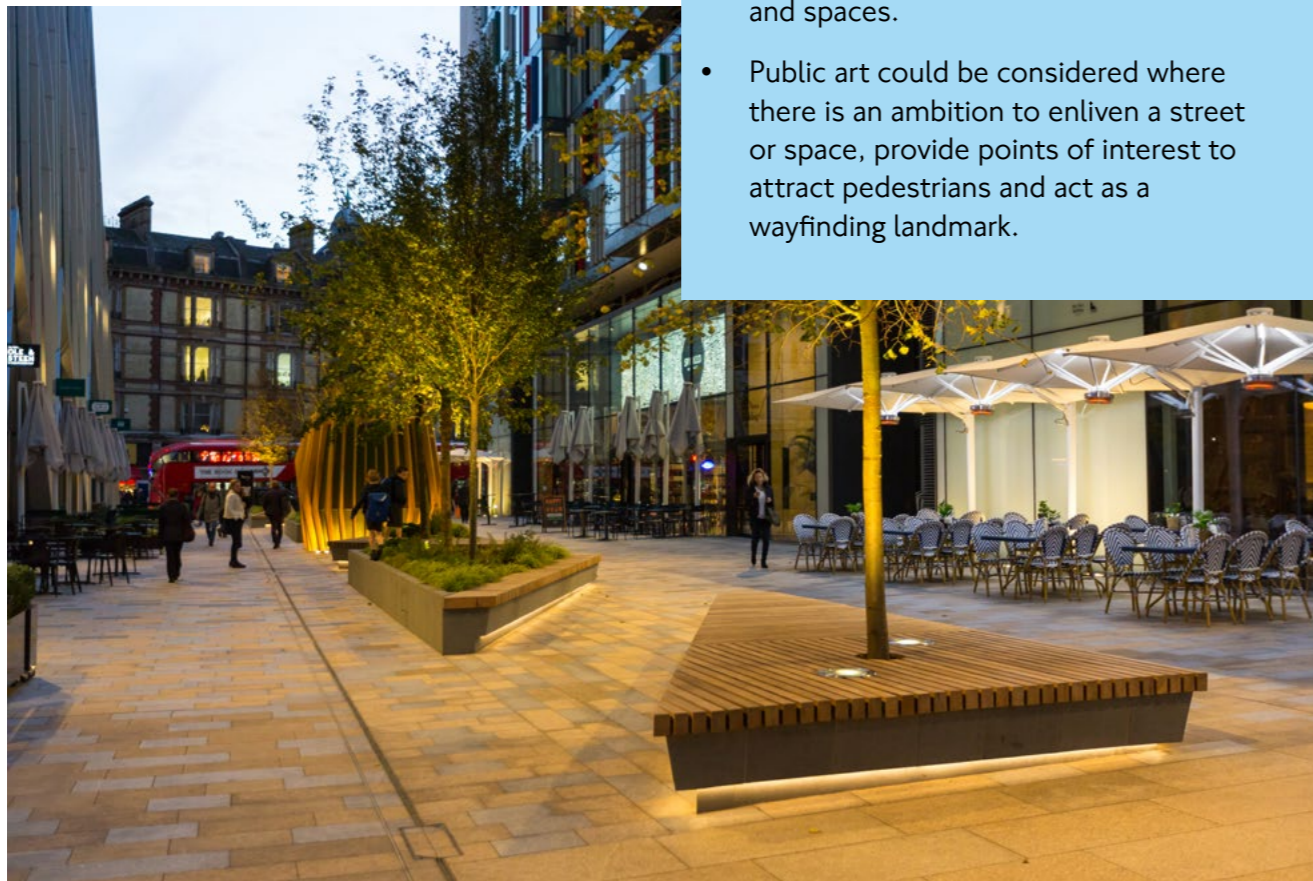
3.7 Attractive

A combination of factors contributes towards making the public realm attractive, including the consistency of materials, relationship with the architectural character of the place and the functionality of the space.

Maintenance is one of the most significant factors affecting attractiveness; maintaining walking surfaces and street furniture in good condition is fundamental to ensuring an attractive, accessible place for walking.

Minimising visual clutter can also help to enhance the visual appeal of a place by removing unnecessary infrastructure such as excessive signage.

- Set out within the design brief how spaces can be enhanced to provide multi-functional use that will inspire people to walk by being vibrant and appealing to the senses; day and night.
- Existing and potential new green infrastructure must be considered as part of any major street improvement project in order to ensure that environmental, economic and social benefits are delivered to contribute towards creating an attractive walking environment.
- Minimise the application of shared use footpaths and footways which permit cycling where it significantly compromises the pedestrian experience.
- Amenity street lighting offers the opportunity to further enhance the public realm by accenting the architectural context, adding to the vitality of streets and spaces.
- Public art could be considered where there is an ambition to enliven a street or space, provide points of interest to attract pedestrians and act as a wayfinding landmark.



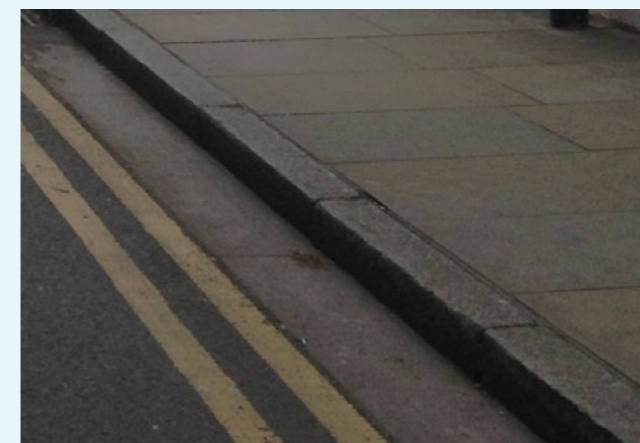
Chapter 4 – Application of the Design Principles

4.1 Inclusive street features for pedestrians

The following features are recommended to support the seven Pedestrian Network Design Principles, particularly to ensure a street is inclusive for all pedestrians. Any deviation from this list of features should only be considered in exceptional circumstances and in relation to a particular problem that is trying to be solved, taking into account the local context and all stakeholder views.



A perimeter footway along the building frontage with recommended clear widths of minimum 2.0m, to allow two wheelchair users to pass one another.



A detectable kerb upstand of at least 60mm is recommended between footway and carriageway on relatively high trafficked streets, to allow all people to know where the footway ends (based on Effective Kerb Heights for Blind and Partially Sighted People, Accessibility Research Group, UCL, 2009). Other arrangements such as level surface treatments in residential developments with very low traffic flows, may be appropriate where delineation of a change in environment is clearly communicated via tactile paving.



Kerb upstands of 100-140mm should be provided at bus stops, to allow for the bus ramp to deploy at an appropriate angle and for convenient access by all.



Tactile paving should be provided at all designated crossing points (using blister paving), to allow for the crossing to cover two strides and be physically detectable (note that the image illustrates national best practice and is aligned with DfT's Guidance on the use of tactile surfaces).



A detectable delineator strip should be provided to delineate cycle tracks at footway level from dedicated footway space. Tramline and ladder tactile paving should be used at the transition to a shared use area with consideration given to omitting the ladder paving on footways on the TLRN (see Streetscape Guidance for further details). Shared use footways where cyclists are permitted to use the footway, compromise pedestrian comfort and are not generally recommended where there are better ways of providing for cyclists (see London Cycling Design Standards Chapter 4 for further details).



Signal controlled crossings should be provided at regular intervals based on the character of the road, to ensure good connectivity at locations where there are local trip attractors and to give certainty in crossing for all road users.



Uncontrolled crossings with dropped kerbs (normally flush but never with upstand greater than 6mm) should be provided at regular intervals, preferably at least every 100m across a main road (based on recommendations by the Global Designing Cities Initiative), to support desire lines and provide access for wheelchair users. Note that 'Look right' and 'Look left' markings are generally only placed in streets where there may be confusion regarding the direction of vehicle flow.



Tonal contrast should be provided between the footway and carriageway, to provide a clear visual definition for each area of the street.



Street furniture including temporary or moveable furniture should be located in consistent 'furniture zones' on footways, to enable access for all users and minimise creating an obstruction.



Position formal seating at 50 metre intervals in busy pedestrian areas and where practicable on main walking routes (based on DfT's Inclusive Mobility guidance, 'Recommended distance limit without a rest').



Encroachment of infrastructure onto footways that does not directly serve pedestrian needs should be minimised; for example, electric vehicle charging points should be positioned such that they do not reduce the effective clear width of the footway below minimum recommended levels (see London's Electric Vehicle Charge Point installation guidance, TfL 2020).

Appropriate disabled persons car and cycle parking spaces should be provided on or near streets which have a public trip attractor, to maintain access for people with limited mobility.



4.2 Planning for construction activities

Pedestrian routes around construction works should avoid footway closures or diversions where practicable.

Pedestrian routes through or adjacent to construction zones need to be designed to ensure they fulfil the seven Pedestrian Network Design Principles. This is particularly important for blind and partially sighted people as changes in the arrangement of the walking environment can create confusion and difficulties in onward navigation. Maintaining a route parallel to the original layout is preferred to maintain route continuity.

The Construction Phase Plan and Traffic Management Plan should identify mitigation measures to maintain access and safety for all road users.

In most locations, the design of the construction arrangements should prioritise pedestrian movement over construction vehicles and any access points should be carefully managed to minimise risk of interactions.

During construction and post completion it is important to keep local accessibility groups and schools informed so they know to be aware that the streetscape has changed.

Detailed requirements for pedestrians at construction work sites can be found in TfL's **Temporary Traffic Management Handbook (2018)**.

Satisfactory use of signage and ramping to direct pedestrians onto a cordoned off section of carriageway.



4.3 Planning for maintenance

The condition of furniture and surface materials, the upkeep of soft landscaping and the clearing regimes of litter and fallen leaves, all affect a person's perception of a place. Some maintenance and design issues may only become evident in certain situations such as excessive ponding of water on footways in wet weather or the lack of lighting when it is dark.

Maintenance requirements should be considered as part of the design brief so that delivered schemes can be efficiently and economically maintained. Well-designed schemes should provide high performance standards that ensure long lasting durability.

The Construction Design and Management Regulations 2015 (CDM) requires all designers to include due consideration for how the scheme will be maintained following construction. It is vital to utilise a process of risk management to identify and control foreseeable risks through design by reducing or, where possible, eliminating the need for future maintenance interventions.

It is important to establish a mechanism that ensures the surfacing specification of reinstatements after utilities works, matches the surrounding surface materials to maintain a high quality aesthetic and ensure the long term integrity of the surfacing.

Strategies of maintenance minimisation can be achieved by:

- Specifying materials that are fit for purpose
- Minimising street clutter
- Carefully considering the implications of using bespoke treatments
- Locating structures and facilities where they are less inclined to be damaged.

Part C. Planning & Design Tools



Overview of Planning & Design Tools

This section describes the tools and techniques available that can assist in applying the seven design principles at various stages in the planning and design process. Good planning for walking considers different urban scales to ensure that localised design features work as part of a connected and legible wider walking network to create healthy and attractive places to walk.

This part of the document is presented to follow the structure of a typical planning and design process. Some tools will be applicable at more than one stage. For example, community engagement, Equality Impact Assessments and Road Safety Audits will likely be conducted throughout the whole design process and can generate valuable input at each design stage.

Not all the tools are necessary for all projects and each summary description gives suggestions on how a particular tool could be used and the outputs that can be expected to help inform the relevance of that particular tool. This list does not cover every tool available to practitioners but suggests some of the most commonly used processes applied by Transport for London for schemes that impact on pedestrians.

Table 3: The structure for Part C. Planning & Design Tools

Chapter 5 - Processes to shape the design brief throughout the life cycle of a project

Chapter 6 - Tools to understand key issues across different spatial scales

1. City scale analysis to strategically identify key issues for walking, as well as locations to prioritise and investigate in more detail
2. Neighbourhood and local scale assessment of spatial characteristics in order to identify key infrastructure issues and opportunities to enhance the public realm
3. Detailed assessment of walking behaviours in a local area in order to identify key movement issues and opportunities to enhance the experience for people walking

Chapter 7 - Bringing it all together

Project identification and design brief development

Chapter 5 – Processes to shape the design brief throughout the life cycle of a project

5.1 Community engagement

Ideally engagement starts before the scope of the project has been defined in order for communities to contribute meaningfully to setting the brief and to be involved throughout the design process.

Continued engagement throughout the project can be beneficial and particularly before key design stages, so that there is a genuine opportunity for change to be made to the design.

Effective techniques for engaging with local communities include:

- Site visits to identify key issues, including involving schools and local businesses
- Round table workshops or ‘design charrettes’ to provide an open forum for discussion. Consider locating the workshop outside to attract passers-by
- Door to door engagement and community drop in events
- Community design reviews
- On-street trials to test the operation of a preferred design or to compare multiple options.

Useful tools include:

- Street condition and place audit tools such as ‘Placecheck’ or Living Streets’ Community Street Audit
- Online engagement tools that allow the public to comment on existing issues in an area or on design proposals allow a wide range of people to enter the conversation in an open and transparent manner
- Visualisation tools such as ‘Streetmix’ that provide a quick way of showing different road space allocation options to get a sense of what is achievable within a limited space.
- TfL’s ‘Small Change Big Impact’ toolkit sets out a recommended approach for community led projects initiating light touch or temporary measures.



5.1 Community engagement (continued)

Designers need to engage with local residents and groups that represent the diversity of the area they are working on, including but not limited to those groups who represent issues of accessibility, age, faith, gender, parents, race etc.

Given the needs of these groups, the engagement itself needs to be accessible and may include:

- Sketches, diagrams and cross-sections - all important to help people visualise proposals
- Video journal recordings to understand the lived experience of different people
- 3D models of proposed designs to be included at workshop events

Good communication of design options is crucial for a constructive conversation; depending on the stage of design, the following information is recommended to support effective communication of the design approach:

- Pedestrian, cycle and traffic flow data and key movement observations
- Collision data and detailed analysis of collisions involving pedestrians
- Clear differentiation between existing facilities and changes proposed including widths and level changes as appropriate
- Pedestrian crossing times as part of the existing and proposed arrangement where a controlled crossing features as part of a scheme.

Consideration of community needs should not end once the preferred design has been selected; it is important to provide opportunities for local involvement in the testing and build phases where appropriate, such as through on-street workshops and DIY initiatives including tree planting.

Engagement with stakeholders has revealed that for some people, particularly those with visual impairments, Zebra crossings do not offer the same level of comfort and certainty as signal controlled crossings. While Zebra crossings may have a role to play in suitable locations where provision of regular crossing opportunities is desirable, these should be planned in combination with signal controlled crossings as part of an area-wide inclusive connectivity strategy to ensure that the needs of all people are accommodated across an area.



5.2 Equality Impact Assessments

All new programmes and projects should have an Equality Impact Assessment (EqIA) undertaken to ensure that the Local Authority has met its Public Sector Equality Duty. An EqIA provides a framework for anticipating the likely effects of planned work on people with the characteristics that are protected by the Equality Act (age, disability, gender, gender reassignment, pregnancy and maternity, race, religion or belief and sexual orientation, marriage and civil partnerships).

To be most effective, EqIAs should be implemented early in the planning process and used to shape the design brief. Specific issues, such as those listed under the Inclusivity principle in the Pedestrian Network Design Principles chapter, should be highlighted for the existing situation and design proposals set out to improve conditions. The EqIA will then act as a log to document any design changes made throughout the design process.

All local authorities should have an EqIA template and a process for following up on identified issues. Proactive use of the assessment and an engaged conversation around the issues is crucial for demonstrating good decision-making.

5.3 Road Safety Audits

Road Safety Audits are essential in assessing the operational road safety impact of a new street scheme where there is a physical change that will impact on road user behaviour.

Undertaken by a team of independent and specially trained auditors, Road Safety Audits consider the safety implications of design interventions, including the impact of the overall layout on the network under all anticipated

operating conditions and the potential implications for all road users, especially the most vulnerable.

The process for completing Road Safety Audits on the TfL network is specified in TfL Procedure SQA-0170. Local authorities may have their own Road Safety Audit Procedure, if not the use of TfL's Procedure is recommended, or the National Standard for Road Safety Audit (Design Manual for Roads and Bridges Standard GG-I 19) may be followed.

Collision investigation

Identifying existing patterns in traffic conflict should be investigated, particularly where a pedestrian has been involved, to identify any trends in problematic behaviours that can be reduced through design. Contributory factors noted in STATS 19 data are typically a subjective opinion of the reporting Police Officer at the time of the incident and may have limited application; however assessors are encouraged to refer to **Guidance for the analysis of STATS 19 contributory factors** (TRL, 2010) to build an understanding of safety issues associated with a particular site.

In 2016 a new Case Overview and Preparation Application (COPA) system of collision reporting was introduced whereby the type of injury suffered is reported by police with the recording system automatically assigning an injury severity. TfL's 'Casualties in Greater London' factsheet provides an annual update covering all highway authority roads, with data on types of collision, different junction controls, crossing facilities and collision rates per kilometre of road.

TfL's Road Safety Audit team offers London boroughs an auditing service for part TfL-funded schemes, although there will be a charge for this service. The team can be contacted at: TfLSafetyAudit@tfl.gov.uk

Chapter 6 - Tools to understand key issues across different spatial scales

6.1 City scale analytical tools for project prioritisation, brief development and objective setting

At the planning stage when projects are being identified and objectives defined, the following tools help to spatially assess walkability at a network scale and ‘set the scene’ for a project proposal. These tools may be particularly useful in assessing where and how to prioritise resources and investment, to ensure that any proposed improvements for walking are considered as part of a strategic approach that links in with the wider public transport network and future development.

The strategic tools listed in this section have been developed by Transport for London and the Greater London Authority, and while most of the tools are publicly available, the CityPlanner tool is only currently licensed for use by TfL and London boroughs.

Table 4: City scale analytical tools

Information that may be useful to collect for city scale analysis	Suggested tools
City scale analysis of the network that can feed into the development of local plans and strategies for walking	<ul style="list-style-type: none"> • CityPlanner • The London Datastore • Strategic Walking Analysis (SWA) • Public Transport Access Level (PTAL) • Street Types
Identification of areas that have high strategic potential for walking (high number of switchable trips and high walking density)	<ul style="list-style-type: none"> • Strategic Walking Analysis (SWA)
Locations of major trip generators and major severances in the wider area	<ul style="list-style-type: none"> • CityPlanner • The London Datastore • Strategic Walking Analysis (SWA)
Areas where public transport accessibility levels are low and could be improved	<ul style="list-style-type: none"> • Public Transport Access Level (PTAL)
Understanding key movement corridors and the roles of different streets and spaces in an area	<ul style="list-style-type: none"> • Street Types
Green infrastructure, open space and air quality mapping to identify opportunities to improve the walking network	<ul style="list-style-type: none"> • The London Datastore



6.1.1 CityPlanner and Strategic Walking Analysis

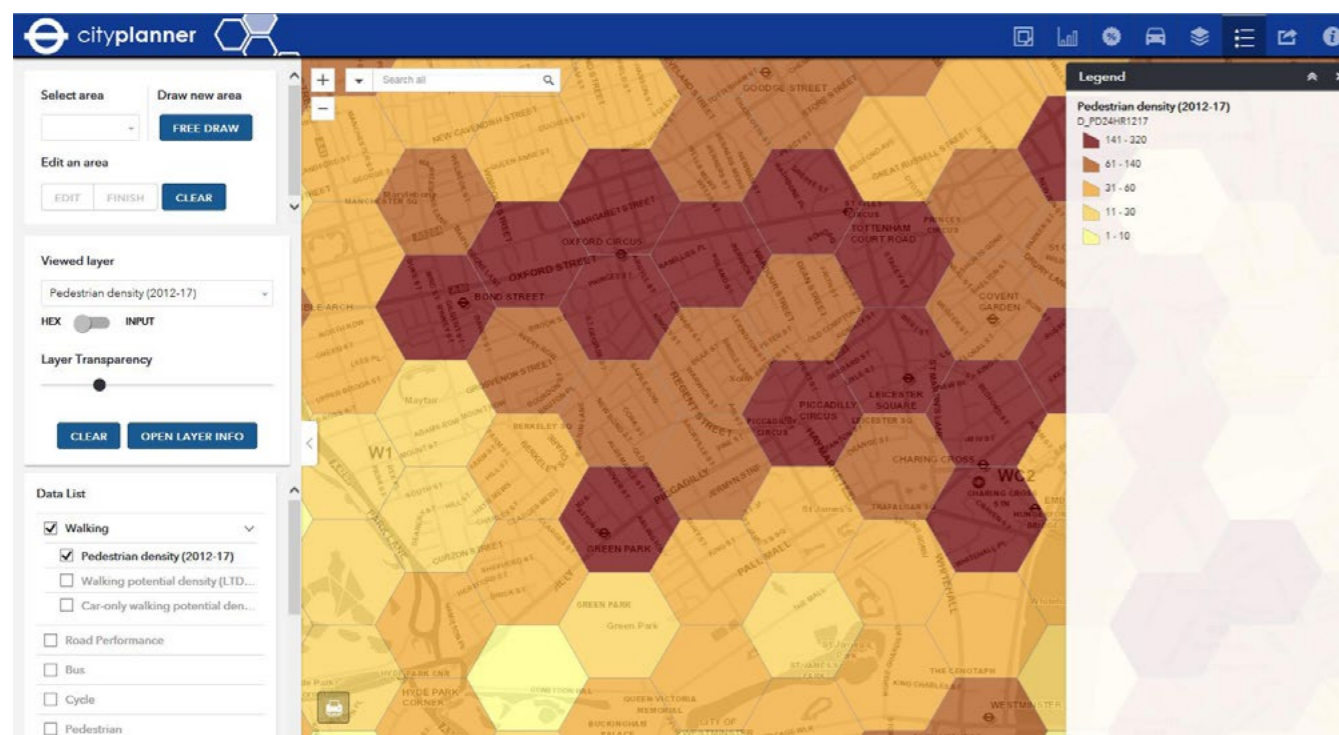
The CityPlanner tool and Strategic Walking Analysis report can be used to enable a strategic level assessment of barriers to walking across the pedestrian network, including footways and footpaths.

The CityPlanner tool is a web based interface for use by TfL, London boroughs and contractors. It presents a wide range of mapped datasets, with the whole of London covered and divided into hexagons of 350m diameter. The tool provides simple and accessible analysis across a diverse range of overlapping spatial datasets for quick area prioritisation, area appraisal and spatial policy analysis.

The tool is designed to generate insight across the Mayor's Transport Strategy (MTS) outcomes to help improve decision-making and scheme development and assist in providing best-value, in line with the MTS.

Uses of the tool for walking design include identifying:

- **Strategic Area Priorities** – spatial analysis to identify priority locations for Healthy Streets investment
- **Area Studies and Reporting** – flexible geography used to assess boroughs, study areas and corridor characteristics and priorities
- **Behaviour Change** – combining employment, pedestrian density, walkability and business engagement datasets to inform the 'Walk the Last Leg' campaign
- **Buses patronage** – to identify where patronage is falling and why it is happening
- **Quick policy insights** – assessment of land use functions and air quality



Extract from the CityPlanner tool; in this example, the dark areas highlight highest pedestrian density - around Oxford Street, Charing Cross Road, Leicester Square, Piccadilly Circus and Green Park station.

The CityPlanner tool is available online for use by London boroughs, their contractors and TfL staff.
Contact CPT@tfl.gov.uk for registering details.

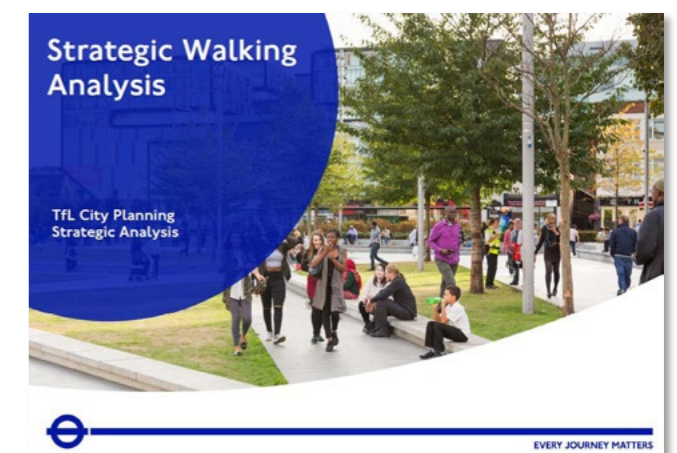
The CityPlanner tool can also be used to better understand spatial factors that contribute to the key barriers to walking, identified through TfL customer research.

Table 5: List of key walking barriers and related datasets available in the CityPlanner tool

Barrier	Strategic Dataset
Not having enough time	<ul style="list-style-type: none"> • Severance • Connectivity to services and opportunities
Distance of journeys	<ul style="list-style-type: none"> • Car dependency and potential switchable trips to walking
Having other ways of travelling that work better	<ul style="list-style-type: none"> • Public Transport Access Level (PTAL)
Personal safety concerns	<ul style="list-style-type: none"> • Street crime score
Too much traffic travelling too fast	<ul style="list-style-type: none"> • Street Types
Streets are not pedestrian friendly	<ul style="list-style-type: none"> • Pedestrian crowding
Road danger concerns	<ul style="list-style-type: none"> • Road casualties

In addition to the CityPlanner tool, the Strategic Walking Analysis report can be used to view:

- Existing walking levels in an area
- Walking potential in an area (i.e. trips that could feasibly be walked that are being made by other modes)
- Barriers to walking e.g. severance, road safety issues and crowded footways



The report considers approaches on how to use this data to prioritise interventions in areas with most potential, available [here](#).

6.1.2 The London Datastore: Green Infrastructure Focus Map

The London Datastore is an online hub featuring a wide range of regularly updated urban datasets, managed by the GLA and openly available to all. It includes georeferenced shape files that can be downloaded for use in GIS, as well as online maps presenting the latest environmental, economic and social data.

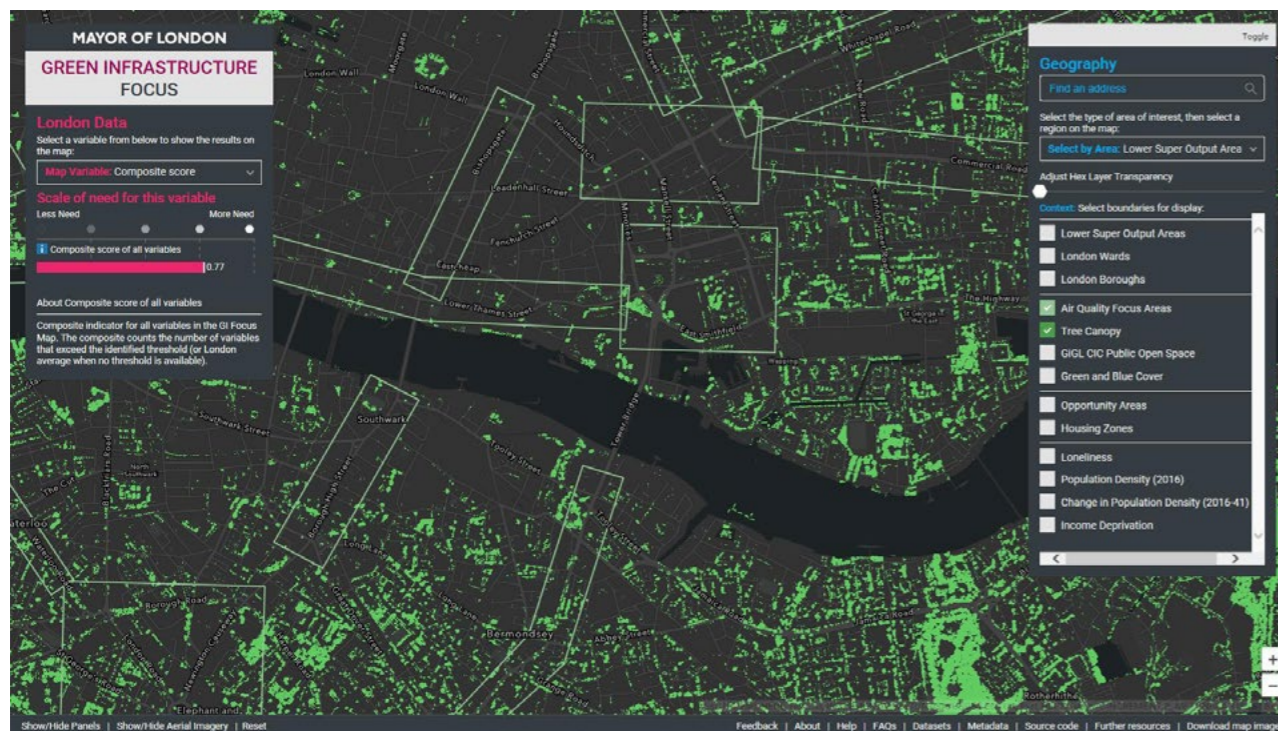
The Green Infrastructure Focus Map in particular provides a number of relevant datasets that can provide information to support the assessment of an area for walking quality, including data that is not readily available in the CityPlanner tool.

The map provides a detailed tree canopy cover layer, open space designations, blue and green infrastructure cover, and air quality focus areas; locations identified by the GLA where there is anticipated high human exposure to air pollution. Together these layers can provide a rich degree of environmental information to assist in strategising improvements for walking.

The map also includes reference to other development considerations including Opportunity Areas and Housing Zones, as well as social factors such as income deprivation, to supplement the environmental data.

This tool is recommended for use when scoping key issues for walking as part of a city scale or neighbourhood analysis, and where improvements for walking demand a comprehensive strategic approach.

Click [here](#) to access the **London Datastore** and [here](#) to visit the **Green Infrastructure Focus Map**.



The online map offers a high resolution of data, which can be used at various scales of analysis; shown here with tree canopy cover and air quality focus areas highlighted.

6.1.3 Strategic Levels of Service: Street Types

In 2014, the Roads Task Force established a framework of Street Type definitions to understand the range of Movement and Place functions of streets across London: the Place function defined by the street's catchment area, the Movement function defined by the importance of the street in relation to trips being made on the street network for all transport modes, including people walking.

Street Types can be useful to summarise the character of a street and help to build a case for providing a proportionate response for improving pedestrian facilities.

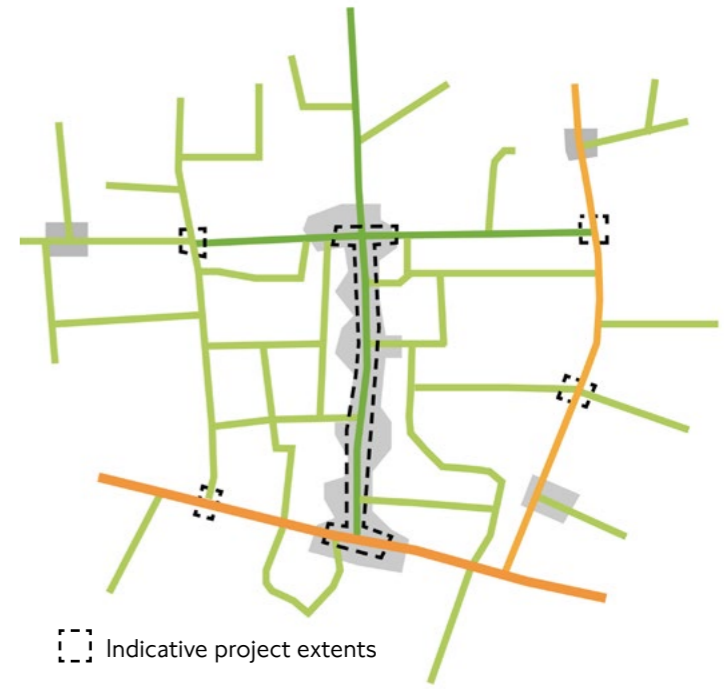
TfL has already agreed Street Types with local highway authorities as part of a collaborative approach to classify a location's function as part of London's street network.

Street Types provide a common context allowing us to focus on providing consistent facilities that represent how people are using a space as opposed to how it is governed by highway authorities.

Locations with higher place functions, such as town centres, benefit from scheme designs that promote pedestrians dwelling, which is also desirable for economic benefits. Likewise, where movement is the priority, such as routes out of mainline stations, pedestrian design should generally address footway capacity and route directness as priorities.



London's Street Types



Example of street types mapped around a high street and areas where interventions might be prioritised to improve accessibility to the high street

6.1.4 Transport and network connectivity

Public Transport Access Level (PTAL)

PTAL is a measure of connectivity to public transport in London and is mapped to the walking network and based on:

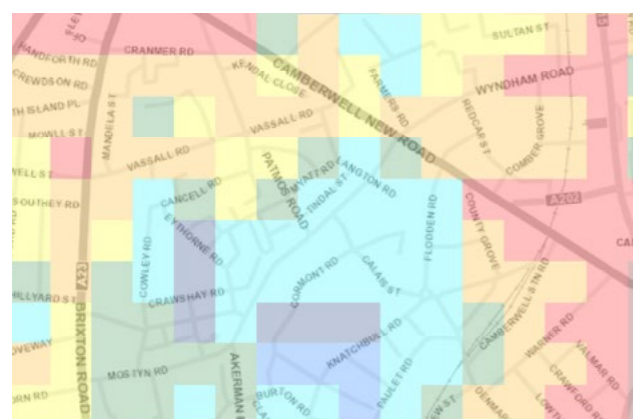
- distance to the nearest station or stop
- waiting times and service frequency
- proximity to major rail stations

In measuring the PTAL for a local area, the walking distance to the nearest station or bus stop is taken into account – it measures whether people are within 640 metres of a bus stop, and / or 960 metres of a rail / underground station.

Already more than 99 per cent of London’s population live within 640 metres (an eight minute walk) of a bus stop, and TfL has a target to ensure all new households are a maximum of 400 metres walk to / from a bus (or tram) stop. It should be noted that for many older and disabled Londoners 400 metres would be too far to walk.

Assessing Transport Connectivity in London 2015 provides advice on how to use PTAL data and get the most out of it for a specific assessment of connectivity.

Example Public Transport Accessibility Level (PTAL) map



For any selected location, PTAL suggests how well the place is connected to public transport services. It does not cover trips by car.

A location will have a higher PTAL if:

- it is at a short walking distance to the nearest station or stop
- waiting times at the nearest station or stop are short
- more services pass at the nearest station or stop
- there are major rail stations nearby
- any combination of all the above.

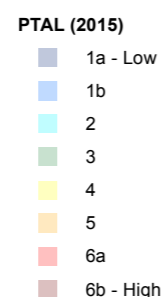
It should be noted that PTAL does not take into account the destinations you can travel to, from each location, nor does it show the ease of interchange. It also does not reflect levels of crowding on buses or trains, and does not show whether a location is physically accessible to all people.

CityPlanner and PTAL

The CityPlanner tool includes a layer for ‘Connected PT Indicator’ under ‘MTS outcome indicators’. This layer is based on:

- PTAL
- jobs accessible in a 45 minute journey
- population accessible in a 45 minute journey
- households accessible in a 45 minute journey

Analysis of an area using this CityPlanner layer can help provide a wider definition of connectivity, albeit at a 350m resolution.



Web-based Connectivity Assessment Toolkit (WebCAT)

A more granular level of connectivity can be explored using the Web-based Connectivity Assessment Toolkit (WebCAT) which uses 100 metre squares showing PTAL rankings.

In relation to planning for walking, WebCAT can be useful to understand:

- how well connected different areas of London are to the wider transport system
- how new developments will integrate with the existing transport system

WebCAT includes PTAL data and is accessible online by clicking [here](#).

The toolkit contains two ways of measuring transport connectivity:

1. PTAL assesses connectivity (level of access) to the transport network, combining walk time to the public transport network with service wait times.

PTAL can be viewed for the whole of London or for individual locations, in both the current (base) and future transport networks. A breakdown of the type of public transport services accessible for specific locations is also available.

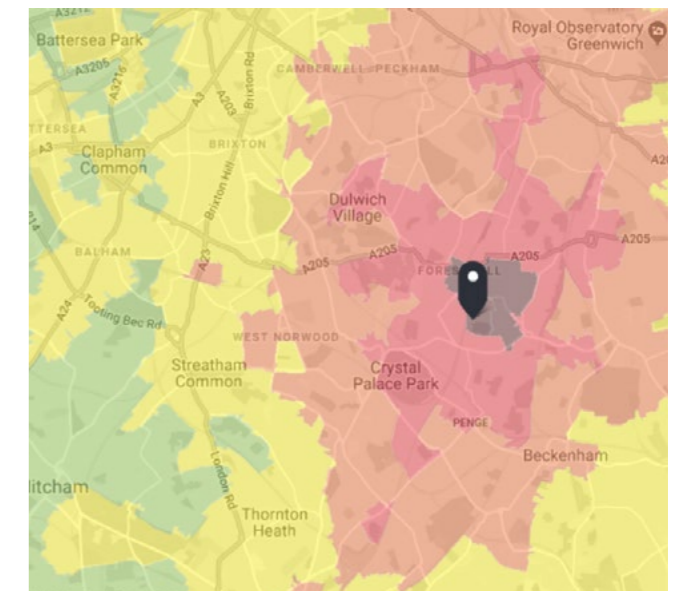
2. Time Mapping analysis (TIM) assesses connectivity through the transport network or, in other words, how far a traveller can go expressed as a series of travel time catchments

The TIM tool allows plotting of travel times on the map for any location in London with user-selected attributes including year, travel mode, time period and direction.

Other network connectivity considerations and tools

Route quality is important when considering connectivity and should be assessed where an existing route may be creating issues of severance due to a lack of attractiveness – see 6.2.7 Walking environment condition assessments.

Urban design analysis can be used as an additional approach that can highlight the urban structure and block size to understand the ‘urban grain’ and whether there is a lack of intersecting side streets, contributing to low connectivity. Aspects of this approach are discussed in the next section.



Time Mapping (TIM) analysis map



6.2 Neighbourhood and local scale analytical approaches for assessing existing infrastructure issues

Where a more detailed assessment of existing conditions is needed, a range of data collection and analytical tools can be used to examine factors affecting walkability in a local area.

Understanding existing walking conditions is vital to determine the main barriers for walking in an area, and how to prioritise interventions that will improve conditions for pedestrians. These tools help a designer to assess the existing physical infrastructure and character of a defined local area – this could be a street, a collection of streets, or a neighbourhood, depending on the scope of the project.

The suggested tools act as a complementary process to local engagement and should not replace the application of participatory activities that directly involve local people.

Designers may choose to combine the outputs of these tools as part of a baseline study, to ascertain the quality of the existing walking environment and, combined with tools that examine existing walking behaviours, define the key issues for the area at a neighbourhood or more local scale. This process benefits from data collection for several transport modes, such as motor vehicle flows and speeds, to build a robust understanding of the range of existing issues that impact on the pedestrian experience.

Table 6: Neighbourhood and local scale analytical tools

Information that may be useful to collect for neighbourhood / local scale analysis	Suggested tools and techniques
An understanding of the local walking catchment area 'as the foot falls' (960m / 12 minute walk)	<ul style="list-style-type: none"> • Neighbourhood scale mapping and analysis
Key local barriers to walking and locations of severance such as railway bridges or large junctions	<ul style="list-style-type: none"> • Neighbourhood and local scale mapping and analysis • Street types • Community engagement
An understanding of neighbourhood character, land uses, destinations and attractors, walkable routes and connections	<ul style="list-style-type: none"> • Neighbourhood scale mapping and analysis • Street types • Community engagement • Transport Assessment Guidance
An audit of the quality of a street and the user experience of walking	<ul style="list-style-type: none"> • Healthy Streets Check for Designers • Pedestrian Comfort Guidance • Walking condition assessments • Community engagement • Guide to Healthy Street Indicators
Identification of locations with poor walking connectivity and legibility	<ul style="list-style-type: none"> • Neighbourhood and local scale mapping and analysis • Walk time calculations • Walking legibility assessment • Computational spatial connectivity analysis

6.2.1 Neighbourhood scale mapping and analysis

The following list of baseline data collection processes should be used as a starting point for building an understanding of the spatial layout and configuration of the neighbourhood, to identify key issues and opportunities as part of the design brief.

Design teams should identify at an early stage which data will be most helpful for informing the design brief, based on early engagement with the local community.

It can be useful to build an understanding of the strengths and weaknesses of a neighbourhood by mapping existing and proposed features, which can be used to start to identify potential opportunities to improve conditions for pedestrians. The neighbourhood scale can be a useful level of detail to link the city scale and more localised issues for walking.

Defining the study area – the walkable neighbourhood

A walkable catchment area can be considered as around an 800m straight line distance from a neighbourhood centre (often termed the 'Pedshed'). This generally corresponds to a 12 minute walk or a 960m walking distance within the street network. Some people are unable to comfortably walk this far, so it is important to note that a walkable neighbourhood is one that provides sufficient infrastructure to be inclusive for all users, with facilities such as bus stops located within this walkable catchment.

Mapping the distance along streets, rather than as the crow flies, is a more accurate analysis of a real walking catchment area on the ground compared to an 800m circle laid out on a plan. The straight line distance is acceptable for a strategic assessment, but where more detail is required, it is recommended to identify the experience of walking from A to B.

The 'Pedshed' can simply be sketched by hand on a map base using a piece of string that correlates to 960m at the scale of the map base, or by using GIS based software that can automate the walking route analysis.

Measurements are taken from a centre point within a neighbourhood, generally based on a series of land uses that may act as the main trip attractor point for people (such as a town centre).

Where there is no easily definable neighbourhood centre it may be useful to consider other trip attractors such as transport hubs or schools, as well as building on local knowledge to help define the study area. The centre point could also be a new development which is being assessed as part of a Transport Assessment. The line drawn around the study area should be considered fluid; key links or green spaces may fall outside of the boundary line but may need to be included as part of a well-considered neighbourhood analysis. Including neighbouring areas, where practical, reinforces the neighbourhood's context and relationship to local features that may impact on pedestrian movements beyond the study area.



Manually calculating a 'Pedshed' area on a basemap (courtesy of TfL Urban Design)

Key destinations

Mapping land uses and trip attractors including highlighting where active frontages are located can be useful to understand the dynamics of a street and/or neighbourhood. Mapping of areas just outside of the 'Pedshed' area may be useful where practicable to ensure that any analysis is responsive to wider connectivity issues.

Typically a destination based map might include: local retail centres, employment zones, transport hubs, educational facilities, healthcare, cultural centres, leisure and community facilities, and new development sites.



Example of mapping key destinations for pedestrians (courtesy of TfL Urban Design)

Transport connections

Mapping of cycle routes, bus routes, stops and rail stations can be useful for flagging up where pedestrian walking trips are likely to be starting and finishing, as well as for identifying opportunities and constraints across a neighbourhood.



Example of mapping key transport connections (courtesy of TfL Urban Design)



New developments and regeneration projects

Where new planned developments are known, it can be useful to include the size and composition of land uses and the potential for new links through a development site, which may increase the permeability of the neighbourhood.



Example of mapping new developments and regeneration projects (courtesy of TfL Urban Design)

Walking routes to and through open spaces

Mapping these links is useful for identifying connectivity that goes beyond the highway boundary, and may highlight on-street green infrastructure where known, to demonstrate additional qualities of the routes.



Example of mapping key walking links to open space (courtesy of TfL Urban Design)



Severance and barriers to walking

Instances of severance may include elevated roads, rail routes, topography, development sites and infrastructure that does not provide access for all. Poor quality junctions and areas that include large amounts of unnecessary guardrail may also create severance.

Barriers to walking are also perceptual; for example at night time, an unlit park may not be considered as safe by some people, while being fully accessible in the day. Identifying barriers through engagement, will help give different perspectives on what constitutes a barrier to walking.



Dropped kerbs with an upstand of more than 6mm can create a barrier for people using a walking aid.



Example of mapping severance issues and barriers to walking (courtesy of TfL Urban Design)

Character assessments

Character assessments look at the layout and impact of new developments in relation to the unique character of the area, as defined by local landscape, architectural style, views, layout, materiality, historic buildings and landmarks of significance. They may include views and the scale and height of clusters of buildings and the impact of topography. Looking at the origins of a neighbourhood encourages a consideration of historic legacy and sense of place, which in turn can create an interesting and attractive environment for pedestrians.

Walk time calculations

As part of an analysis that looks at spatial connectivity between two key destinations, for example a school and a local bus stop, it can be useful to calculate directness by measuring the actual walking route length compared to the straight line distance. This can be conducted across various scales as necessary to determine route deviation for people walking. Walk time calculations can then be calculated based on the distance, with a standard measure taken as 1.2m/sec. It is important to note that the walk time for many younger, older and disabled pedestrians will be much slower, and this may be useful to explore in more detail with local people as part of an engagement process.

Walk time calculations between two points using different crossing configurations can be useful at the optioneering stage to understand the impact of crossing layouts. In these situations it is recommended to consider crossing signal cycles and/or pedestrian delay to understand the impact of different options.

For streets in new developments, desire lines should be anticipated based on an assessment of the proposed land use and trip attractors in the area, as well as existing patterns of pedestrian movement in the surrounding area.

Walking route legibility assessments

Mapping the number of changes of direction required to complete a walking journey can be a useful approach for assessing legibility, to understand the quality of the pedestrian experience and the challenges people may face when walking.

This form of analysis would typically focus on key routes which link major trip attractors. Ideally this would be carried out on site as a photographic survey, highlighting decision points and places where there may be a lack of landmarks or other features to aid navigation. It is also beneficial to involve local people during legibility assessments to understand what impacts on their preferred route at these decision points.

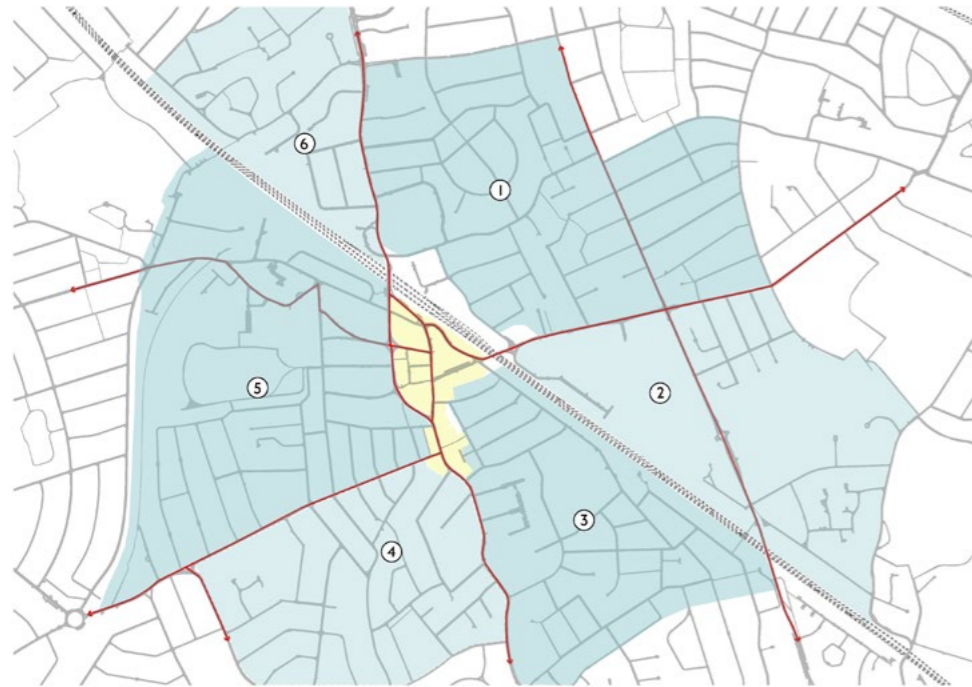
Accompanied visits and journey diary logs can help to capture the user experience and issues associated with legibility.

Computational spatial connectivity analysis

Other sophisticated forms of connectivity analysis can be calculated using computational tools such as the Space Syntax Toolkit, an open source analytical plug-in that is compatible with QGIS software. The tool can be used to quantitatively compare the hierarchy of streets and is especially useful when looking at masterplans and the relationship of streets across a neighbourhood or wider urban layout.

6.2.2 Local street scale mapping and analysis

Subdividing the walkable neighbourhood into smaller scale areas, typically no more than 200m across, can be useful to focus on more detailed spatial qualities of a cluster of streets or an individual street. Mapping these features and analysing their impact will help show what could be achieved through the design process.



Example of a walkable neighbourhood subdivided into smaller segments (courtesy of TfL Urban Design)

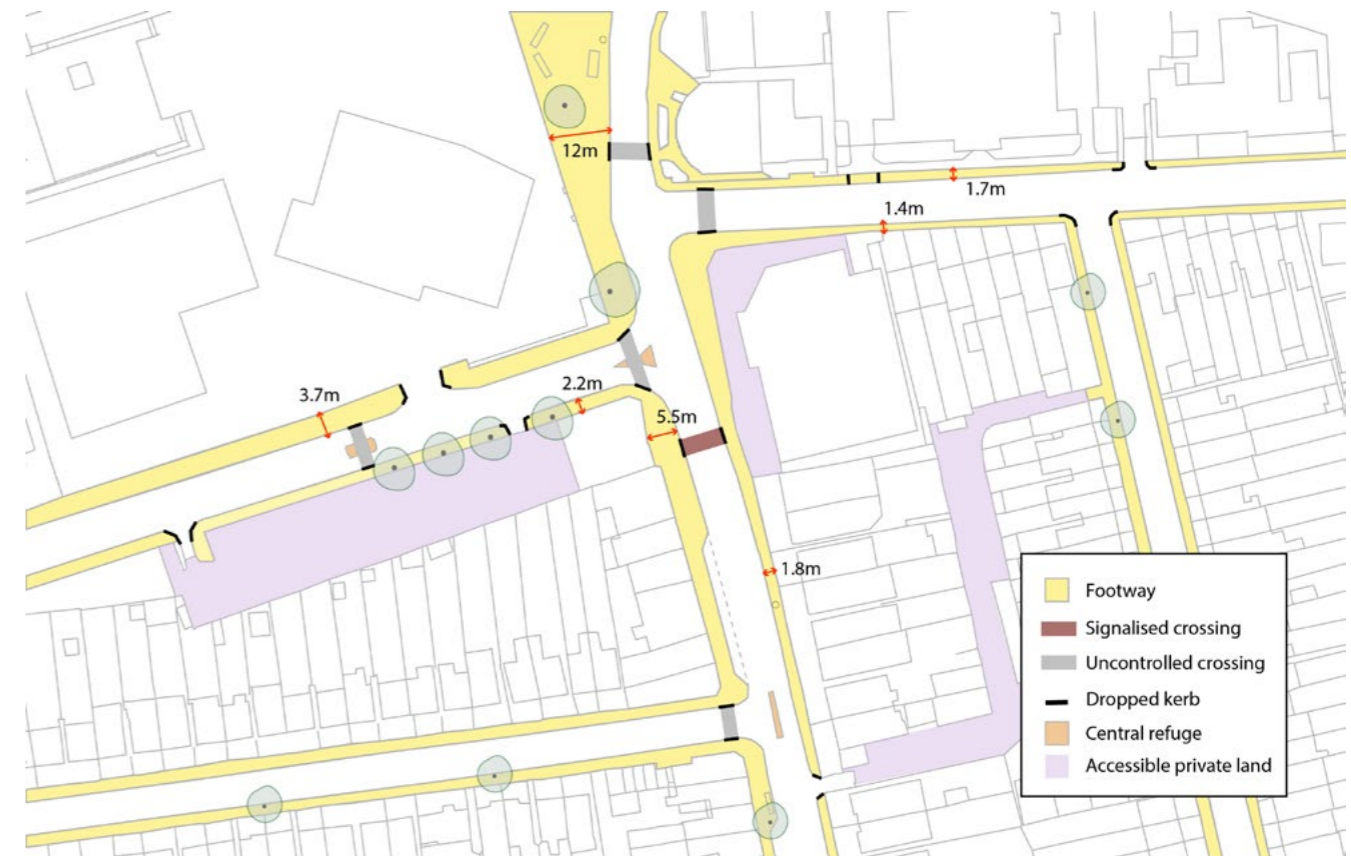
Table 7: Local street scale mapping

Suggested features to map and analyse at the local street scale

Pedestrian surfaces	Kerbside activity
Street furniture	Land use and building entrances
Places to stop and rest	Boundary features and visibility beyond the highway
Footway interruptions	Sunlight mapping

Mapping pedestrian surfaces

At a basic level it can be useful to draw out the key physical features of the street that impact on people walking and highlight these on a plan. This could include highlighting footways, dropped kerbs and the location and type of crossings. Further analysis will identify where there are notable gaps in provision, such as a lack of connectivity or constrained provision, or condition issues, such as poorly laid dropped kerbs (> 6mm) that can bring wheelchairs to a sudden halt.



Example of mapping pedestrian surfaces



Street furniture

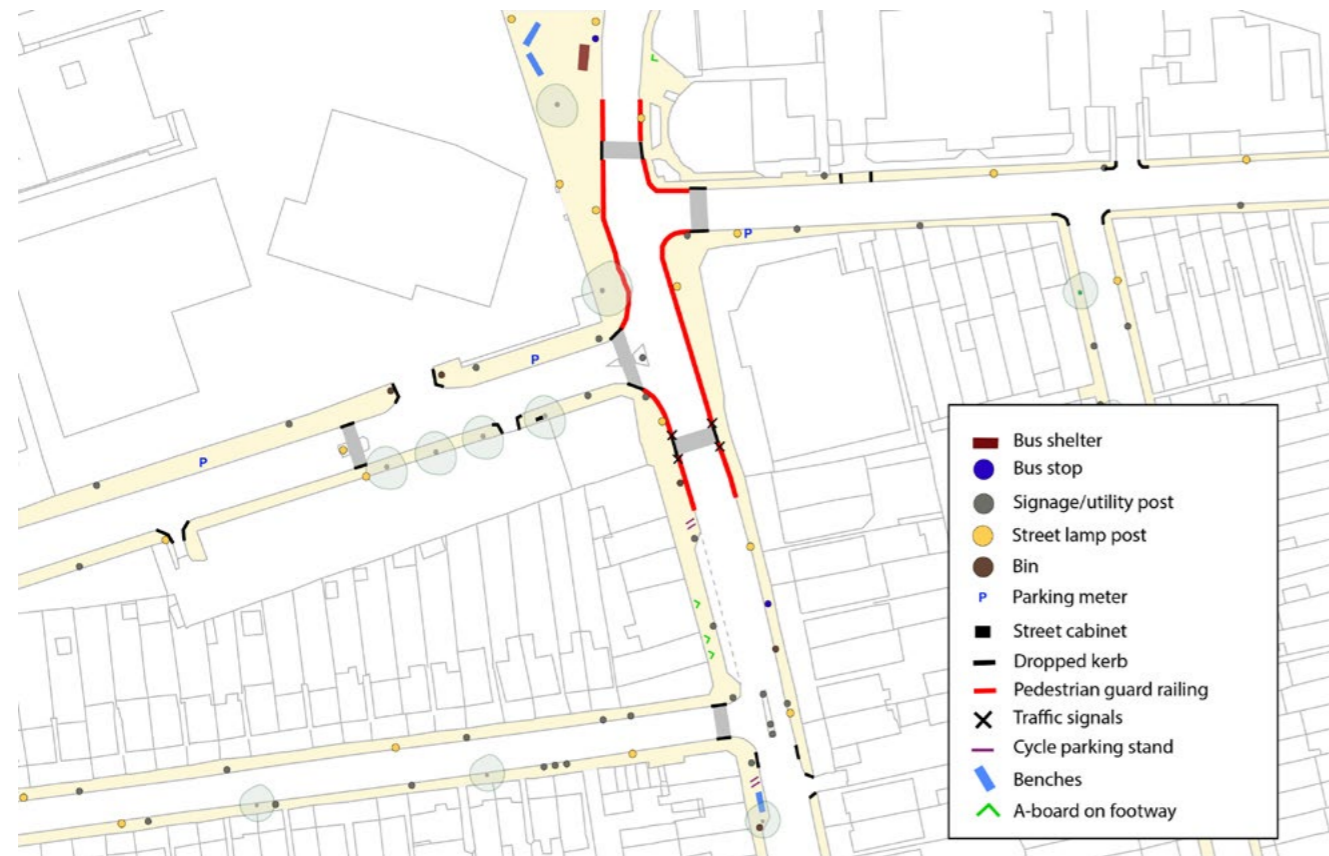
It is critical that existing street furniture is rationalised as part of the design process to reduce physical clutter on footways.

Designers should refer to TSRGD 2016 to look at the potential to declutter signage – one of the most common clutter issues is in relation to the use of vertical signs on either side of the street; many of which are now no longer needed on both sides. Road markings, such as give way lines, may be sufficient in isolation and not need accompanying vertical signage.

Guardrailing has been subject to an extensive removal programme in recent years and this is another example of rationalising existing street furniture to improve the functionality and visual quality of the street.

Other problematic furniture should be identified such as poorly designed gates and access restrictions, for example at park entrances, which can act as a physical barrier preventing wheelchair users and those using mobility aids from accessing public space.

Temporary clutter such as A-boards and wheelie bins may also be worth highlighting where there is scope to influence management regimes.



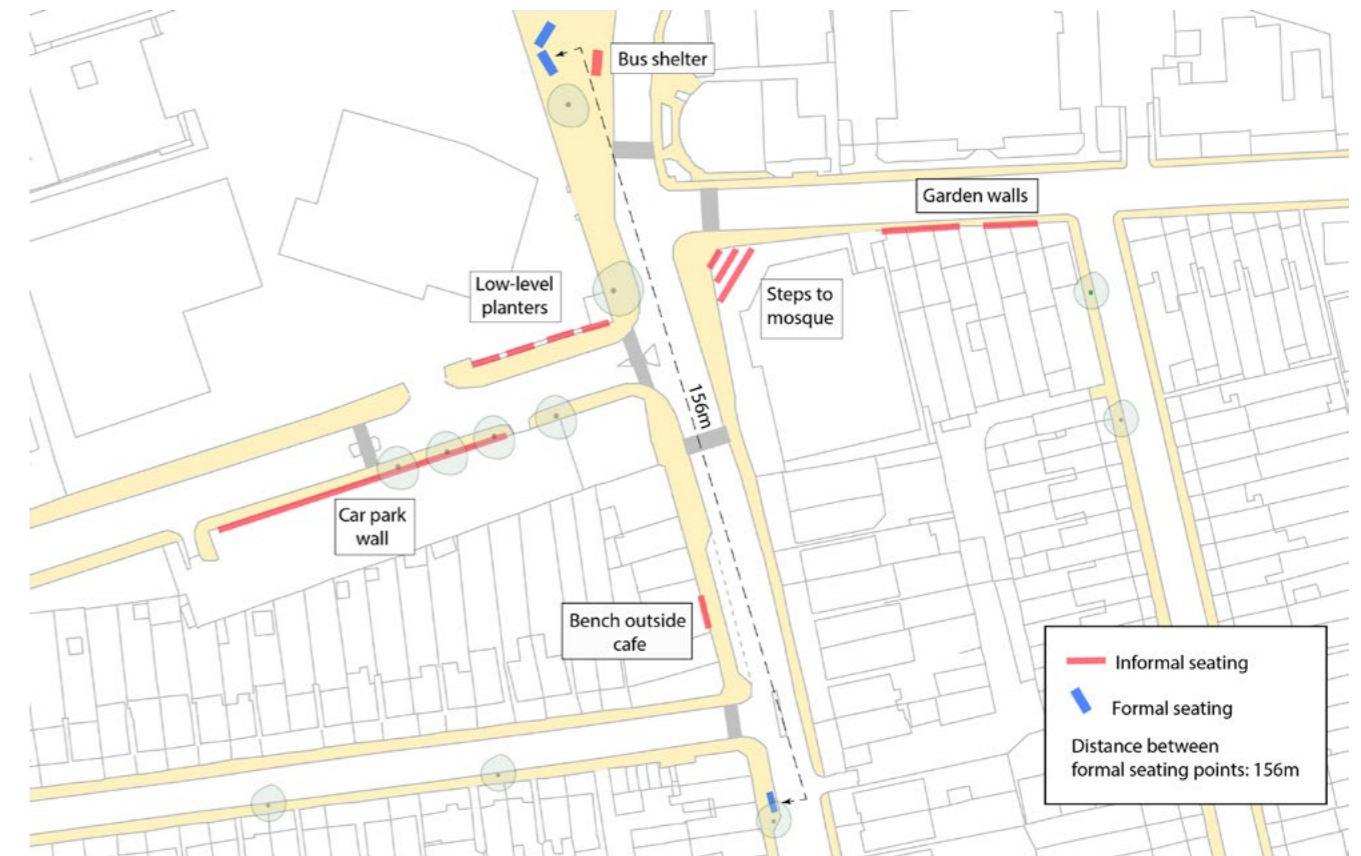
Example of mapping street furniture

Places to stop and rest

Mapping of the distribution of formal seating as well as informal rest points, can build a picture of the quantity and quality of provision across a neighbourhood.

The number, distribution, type, condition and placement of seating can be mapped to create a detailed understanding of existing amenity and plan for additional provision.

Noting where informal rest points are being used for seating such as bollards, ledges or garden walls indicates demand for seating where it may not currently be formally provided.

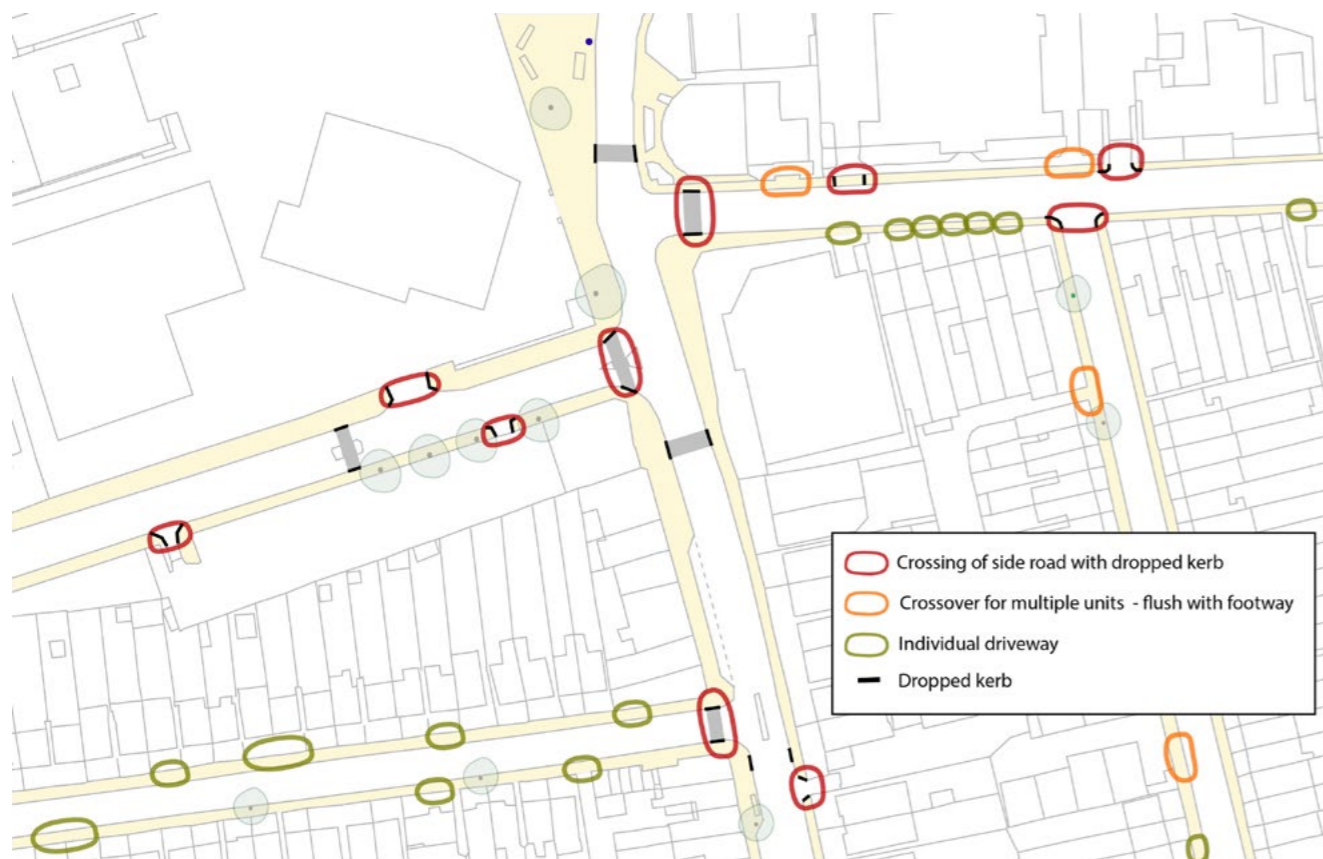


Example of mapping formal and informal seating



Footway interruptions

Mapping interruptions to the general footway including any crossover or minor side road where the continuity of the footway is severed can help to understand the pedestrian experience of the street and identify opportunities to make improvements that reduce the number of interruptions.

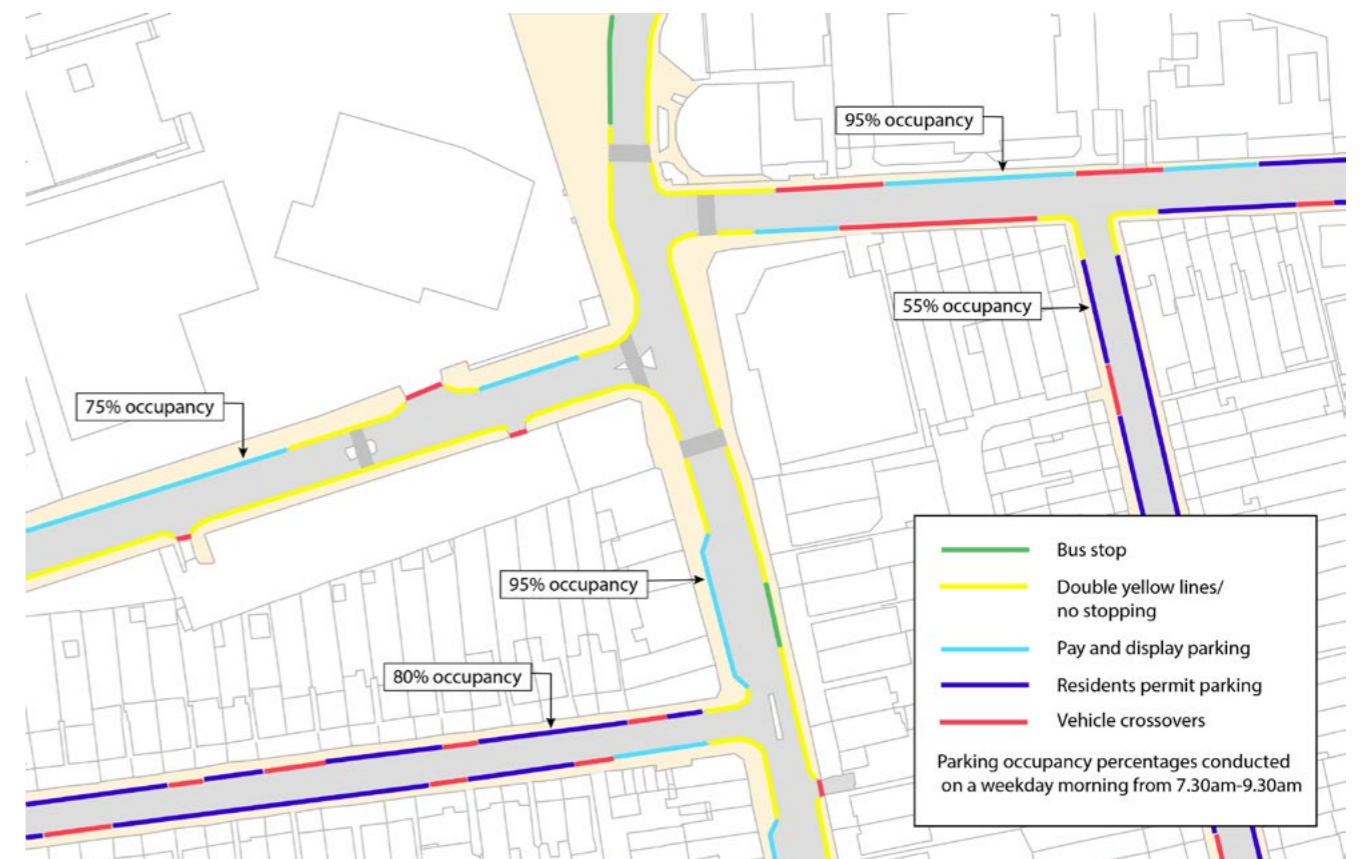


Example of mapping footway interruptions

Kerbside activity

Kerbside designations will typically be mapped as part of the topographic mapping process; however it is also useful to supplement this information with occupancy surveys at different times of the day to understand how drivers are using the allocated bays.

Mapping of this information can provide the clearest way of showing whether there are underutilised spaces and opportunities to change the designation of the kerb edge.



Example of mapping kerbside activity



Land use and building entrances

Mapping of entrances to public buildings and the analysis of when they are open at different times of day can help to understand pedestrian movement patterns to and from attractors in the neighbourhood.

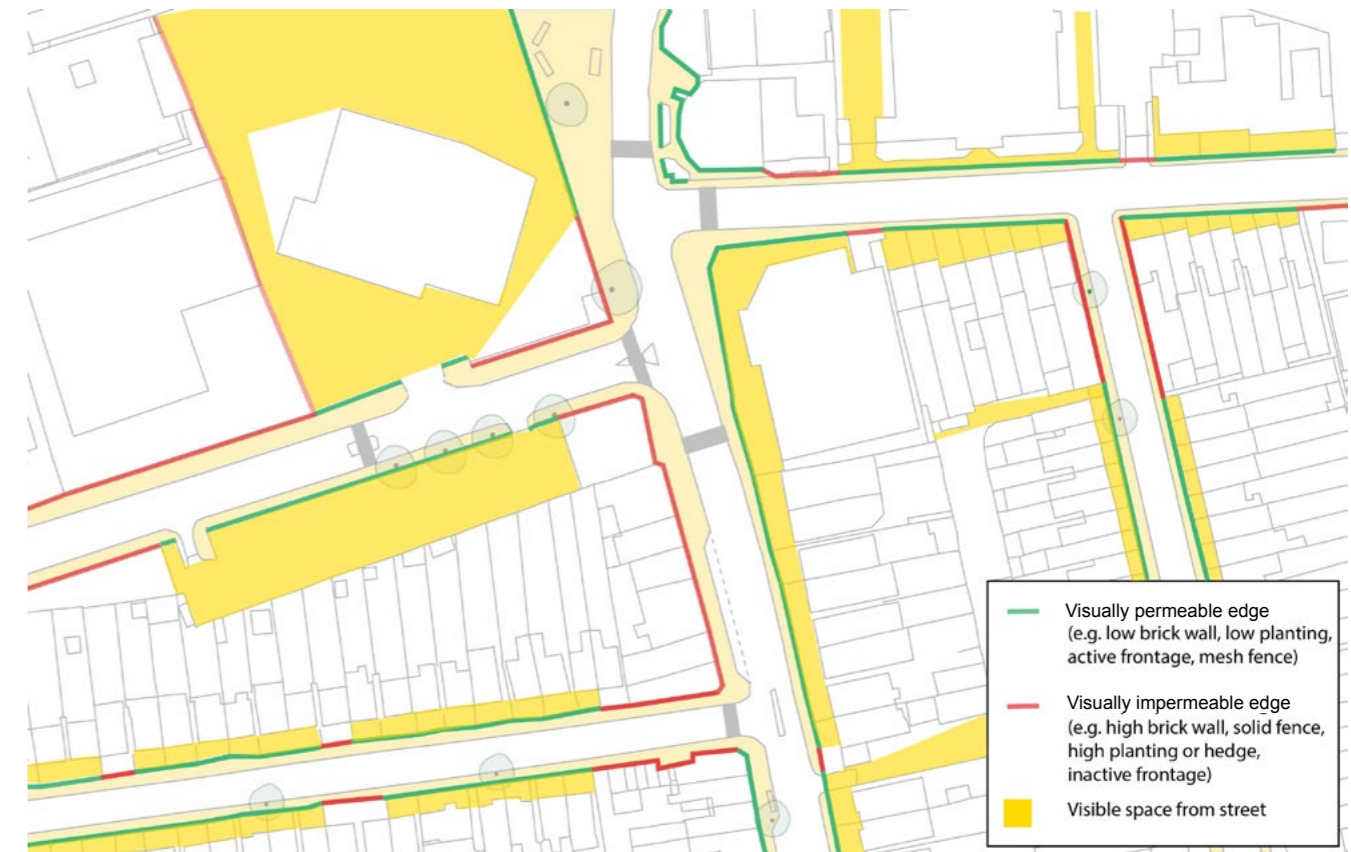
The character of the building façade can also be explored by photographing and documenting the relationship of ground floor activities to the street configuration.



Example of mapping contrasts in public building opening hours at 08:00 and 19:00

Boundary features and visibility beyond the highway

Mapping the visual permeability of edge conditions can be useful when thinking about the experience of walking and what people are able to see and access. Visible space beyond the highway impacts on the character of the street and can be mapped where there is a visually and/or physically permeable edge. This information may be useful to inform whether a particular change on the highway is appropriate to the adjacent space.



Example of mapping areas visible from the highway



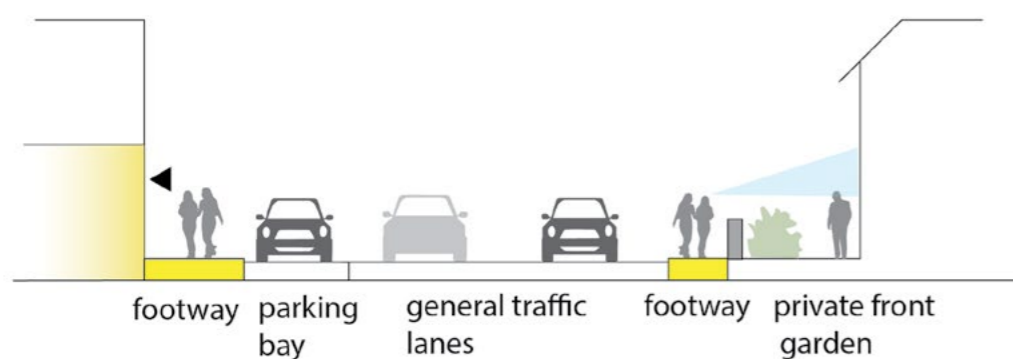
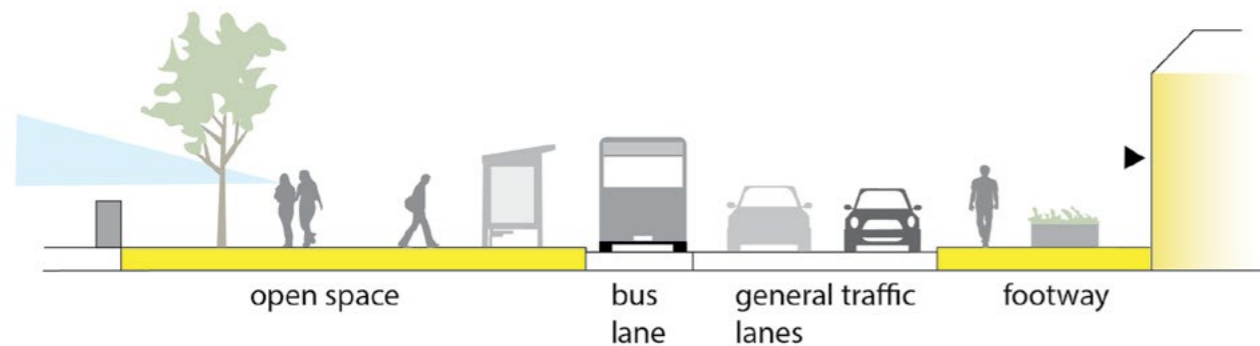
Sunlight mapping

Assessing direct sunlight at different times of day and across the seasons, can be useful to inform street furniture placement, particularly seating and planting. For some areas of central London, 3D models have been developed which can be used to create maps of light and shade and show seasonal variation. Where a model is not available, photographic surveys can be used to ascertain when there is direct sunlight at certain times of day.

Cross-sectional profile of a street

Cross-sectional sketches are useful at key points along a route to visualise how the character of the street changes.

By examining the scale of adjacent buildings in combination to the width of the street and structure of planting, a greater appreciation of the character of the street can be ascertained. The scale and proximity of adjacent buildings can be hugely influential on the pedestrian experience, not just visually; the urban scale affects street level exposure to direct sunlight, impacts on wind, traffic noise and pollution.



Example cross sections to communicate the proportions of the space, building heights, publicly accessible frontages, visually permeable boundary edges and dedicated pedestrian space.

6.2.3 Human scale analysis

Human perspective analysis

Understanding the lived experience of a street from a human perspective is vital to inform an effective design brief that responds to pedestrian needs. While engagement with local people is a key part of this, spatial analysis at the human scale can be an additional helpful way of understanding the actual experience of walking within a street environment.

One approach to visualising the user perspective is to assess four 2-dimensional planes around a pedestrian, whereby the footway, adjacent building line, carriageway space and overhead features, all impact on the quality of the walking experience. The visual below helps to explain this and highlights how different features are located within each of these planes, and can impact on a person walking.

It is suggested that for a specific location, identify the range of features that are present and whether or not these positively or negatively contribute to the pedestrian experience. Where there is a significant contrast in the scale or composition of the street along its length, consider repeating the process to create a series of snapshots of pedestrian experience. This can be a helpful starting point for identifying existing features and key issues that may be considered for change within the scope of a project.

Visualising four spatial zones that impact directly on the pedestrian experience: the footway, building frontage, carriageway edge and overhead.



Table 8: Human perspective analysis

Spatial Zone	Infrastructure that can impact on the walking experience
Footway	<ul style="list-style-type: none"> • Surface materials • Effective width • Street furniture – Lighting, signage, seating • Street trees and planters • Footway design and crossfall • Footway crossovers • Utility covers
Building frontage	<ul style="list-style-type: none"> • Building height • Character and condition of building • Land use and active frontage • Building entrances • Signage and A-boards • Canopies and awnings • Outdoor seating and other furniture
Carriageway edge	<ul style="list-style-type: none"> • Kerb alignment • Pedestrian crossings • Parking and loading designations • Cycle tracks / lanes • Street furniture – lighting, signage, cycle parking, litter bins, • Grass verge, planters, street trees
Overhead	<ul style="list-style-type: none"> • Lighting • Signage • Street trees • Building awnings • Shading structures • Long vistas and landmarks

Visibility analysis

Visibility or 'viewshed' analysis highlights areas of the street that are visible from a selected viewpoint. This analysis may be particularly useful when developing wayfinding strategies or for assessing the visual connectivity of new developments.

Viewpoints should generally be selected at pedestrian decision points, such as at junctions, to understand what people can see and whether additional wayfinding is needed. This can be conducted using GIS but is often best supported with an onsite photographic survey to capture key visibility issues, such as changes in elevation and street clutter. It can also be useful to conduct this analysis at night to highlight issues of lighting.

Conversational comfort

One of the most fundamental human interactions – having a conversation – is also one of the most important design considerations for assessing the attractiveness of the walking environment. Typically high background noise corresponds to 70 decibels or more, and makes it difficult to hear someone's voice.

Road traffic is the biggest contributor to noise pollution in the UK (Speed and road traffic noise, UK Noise Association, 2009), with traffic volume, speed, composition of traffic and the behaviour of drivers (accelerating and braking), as well as the road surface, all impacting on traffic noise.

Where it is difficult to hear a conversation when standing at the side of the road, designers should consider the character of the place and whether noise reduction strategies should be prioritised to contribute to the quality of the experience for pedestrians. Footway widths to accommodate people walking and talking side by side in both directions will require in excess of the minimum recommended 2m footway clear width.

Human comfort assessments

Not to be confused with Pedestrian Comfort Guidance, human comfort assessments may consider air temperature, humidity, solar and wind exposure together to assess the thermal comfort of a local area.

These assessments are unlikely to be conducted on small-scale street projects; however for major new developments, new public space or streets adjacent to very tall buildings, a formal assessment can be beneficial for quantifying issues.

Assessments should be tailored to the scope of the project and conducted by an experienced engineer. It is recommended to consider a 'worst season' scenario whereby the least comfortable conditions are identified regardless of the season.

In new developments where an assessment identifies a likelihood of issues such as high winds impacting on especially vulnerable people, including the elderly, very young or disabled people, alternative routes should be provided or a redesign of the development considered.

6.2.4 Guide to the Healthy Streets Indicators

The Healthy Streets Approach sets out ten interrelated indicators of the quality of a street environment that impact on people walking, cycling and using public transport.

Underpinning all of these indicators is an emphasis on the quality of the experience of being on a street.

Reducing the dominance of motorised traffic is a critical aspect of this approach, coupled with the design and construction of on-street interventions that support the needs of people walking, cycling and using public transport.

As part of the Healthy Streets toolkit, the **Guide to the Healthy Streets Indicators** can be used as a starting point for understanding existing public realm issues. It provides a list of questions relating to each of the ten Healthy Streets Indicators to help prompt an investigation of the factors that affect the experience of people walking, cycling and using public transport.



Table 9: The 10 Healthy Streets Indicators

Pedestrians from all walks of life	Streets should be inviting and accessible for everyone to spend time and make journeys on foot, cycle or by public
Easy to cross	On all streets it should be easy for people of all ages and abilities to find a safe place to cross without having to go out of their way
Shade & shelter	Providing regular shade and shelter from winds, heavy rain, high temperatures and sun exposure can have a significant positive impact on people's ability to travel actively
Places to stop and rest	Ensuring there are places where people have room to stop or somewhere to rest benefits everyone, including local business
Not too noisy	Reducing traffic volumes and speeds, and including low noise road surfaces will all benefit health as well as improve the ambience of street environments
People choose to walk & cycle	Walking and cycling should be designed for to be the most attractive ways to travel on our streets
People feel safe	The whole community should feel comfortable and safe from crime, intimidation or injury on any street day and night
Things to see and do	People are more likely to travel actively when there are things to do locally and will also be less dependent on cars if shops and services are within walking distance
People feel relaxed	Good quality street design and a clean, well kept environment can help create attractive and relaxing places to walk and cycle
Clean air	Reducing the amount of traffic on the road or reducing the number of high polluting vehicles will help improve local air quality



6.2.5 The Healthy Streets Check for Designers

The aim of the Healthy Streets Check for Designers is to provide a framework for assessing scheme designs to ensure they are aligned to the Healthy Street Approach. The Healthy Streets Check has been developed to include metrics across the ten Healthy Streets Indicators. These metrics are designed to support a holistic approach to street design, with all metrics having an impact on whether people choose to walk, cycle or use public transport.

In London, the Healthy Streets Check for Designers is generally applied to schemes that are likely to make a significant change to people walking, cycling and accessing public

transport, and there are also programme specific requirements for its application.

Click [here](#) to access **The Healthy Streets Check for Designers** spreadsheet tool.

The following list of factors all impact on the quality of the pedestrian experience and designers are encouraged to focus on these metrics where the focus of the brief is to improve the quality of the street for walking:

Table 10: Pedestrian experience metrics within the Healthy Streets Check for Designers (numbers correspond to the Check numbering system)

1.	Total volume of two way motorised traffic
3.	Speed of motorised traffic
8.	Ease of crossing side roads for people walking
9.	Mid-link crossings to meet pedestrian desire lines
10.	Type and suitability of pedestrian crossings away from junctions
11.	Technology to optimise efficiency of movement
12.	Additional features to support people using controlled crossings
13.	Width of clear, continuous walking space
14.	Sharing of footway with people cycling
19.	Quality of footway surface
20.	Surveillance of public spaces
21.	Lighting
23.	Street trees
24.	Planting at footway level (excluding trees)
25.	Walking distance between resting points (benches and other informal seating)
26.	Walking distance between sheltered areas protecting from the rain including fixed awning or other shelter provided by buildings /infrastructure
28.	Bus stop accessibility
29.	Bus stop connectivity with other public transport services

6.2.6 Pedestrian Comfort Guidance (PCG)

Pedestrian Comfort Guidance is a level of service tool developed specifically for London's streets to provide a standardised approach for measuring pedestrian crowding and comfort on footways, crossings and refuge islands. It relates the peak hour pedestrian flow to the available footway space and can be described as a 'static' model assessment, as it uses a snapshot in time to define the comfort level.

Applying the tool helps to provide an evidence base for proposals that alter footway widths or change the arrangement of street furniture. Design proposals should provide a comfortable arrangement for pedestrians during the peak hour.

Auditors should note that comfort levels on crossings are graded differently to footways. Crossing islands should not have queues forming greater than three rows deep at busy times. With four or more rows, people tend to avoid the island and cross elsewhere. Additionally, if the island has insufficient space a pedestrian can be tempted to cross on the 'red pedestrian symbol' phase.

Where cyclists are permitted to occupy the same path as pedestrians, defined as a "shared use area", it is recommended to consider the impact of the cyclist on pedestrian comfort. The PCG does not provide a formal approach for conducting this; however based on the spatial

principles of a cyclist as defined by the London Cycling Design Standards, a width of 2m could be applied to represent two cyclists passing one another. This width would be deducted from the total effective width for the footway to provide an estimate for pedestrian comfort on a shared use footway.

Pedestrian Comfort Guidance can be used to:

- Understand footway, crossing and refuge island capacity by identifying pedestrian comfort levels
- Predict changes in comfort levels resulting from scheme proposals
- Identify whether footways, crossings and islands can support pedestrian demand
- Assess the impact of street furniture / obstacles on footway capacity
- Identify where to apply mitigation measures such as decluttering, footway widening or crossing widening.

TfL's **Pedestrian Comfort Guidance** is available by clicking this [link](#).

Table 11: Preferred minimum Pedestrian Comfort Levels (defined as 'comfortable')

Location	Flow density (pedestrians per metre per minute)	Pedestrian Comfort Level
Footways on high streets, residential streets and adjacent to major tourist attractions	9 - 11ppmm	B+
Footways at transport interchanges and on commercial / office dominated streets	12 - 14ppmm	B
Pedestrian crossings	15 - 17ppmm	B-



6.2.7 Walking environment condition assessments

Assessing the condition of a street, including maintenance and cleaning regimes, can be an important aspect of understanding the attractiveness of the area for walking. It is important to combine any structured auditing with process with local engagement on accessibility issues relating to the condition of the walking environment.

Several environment audit tools are available and readily used in London:

Pedestrian Environment Review System (PERS)

For schemes which may be looking to upgrade existing facilities, a PERS audit can be an effective way of highlighting key issues across an area. The process should be used in combination with local engagement, not as a replacement for it.

Pedestrian Environment Review System audits can be used to:

- Baseline pedestrian environment quality
- Identify existing infrastructure condition issues
- Predict scheme design outcomes
- Prioritise improvements
- Produce cost effective scheme outcomes
- Recognise specific improvements that are being made
- Record before & after site performance
- Identify factors relating to road safety.

Developed by the Transport Research Laboratory, PERS is part of a family of street audit tools for auditing the condition of facilities for different modes.

PERS can be used for auditing any external pedestrian environment, including footways and crossings, open spaces and waiting areas. It

considers a wide range of factors that impact on the pedestrian experience, including the general look and feel of places. It mixes quantitative and qualitative assessment to understand how a pedestrian space is performing. Results are presented in a seven-point scoring range (from -3 to +3). The average score (a score of '0') should be interpreted as the minimum acceptable standard, with improvement measures targeted at any criteria that score below this value.

PERS provides a baseline score for pedestrian environment conditions and can be used to prioritise interventions. It can also be used to measure the likely impact of improvements. TfL may require developers to carry out PERS assessments as part of significant new land-use developments.

Some elements of the scoring are subjective; therefore TfL recommends that the same auditors are used for a full site assessment, so that there is consistency in scoring where professional judgement is required. PERS results for one site should therefore not be compared with results for a different site, where audited by a different team. PERS software can be purchased from the Transport Research Laboratory to support the processing of data inputs.

Other walking environment audit tools

Other audit tools, such as Living Street's Community Street Audits (CSAs), can provide a useful approach for drawing on local knowledge of an area to identify key issues for walking. This process involves active community engagement as part of a site visit that can form the starting point for facilitating co-design workshops.

'Placecheck' is an alternative approach that employs a structured walk around a study area involving the community. It aims to identify key issues by asking questions relating to how to enhance the special qualities of the place, assessing whether it is well-connected, accessible and welcoming, safe and pleasant and 'planet-friendly'.

6.2.8 Transport Assessment Guidance

Transport for London has issued a **Transport Assessment template** for all new developments of strategic importance.

Planners involved in the assessment of new developments are recommended to refer to this analytical process, which is aligned with the neighbourhood scale analysis approach set out in this document.

Applicants are expected to map key destinations and routes within an Active Travel Zone, defined at both the walkable neighbourhood scale and a wider cycling scale. The relationship of a new development to local public transport options and town centres should be mapped, with issues of severance and opportunities for improvement identified.

Early pre-application discussions between the highway authority and developer are recommended to determine whether a Transport Assessment is required, based on a combination of the proposed ground floor area, land use and localised qualitative factors.



6.3 Analytical techniques for understanding pedestrian movements

These tools and techniques can be used to collect movement data and assess existing pedestrian behaviours.

Pedestrian activity assessments are fundamental for building an understanding of how streets are used, which can help to identify key issues and inform the design development process. This data may also provide an evidence base to make the case for the prioritisation of walking improvements.

Collecting pedestrian movement data can be time and resource intensive, therefore this section highlights the most common approaches

used for understanding pedestrian movement and how to collect a proportionate level of data to justify design priorities for a scheme. It is recommended to visit the site at different times of day to get a clear understanding of the existing urban layout and the implications on pedestrian movement.

Click [here](#) to access TfL's 'Measuring Pedestrian Activity', which gives advice to plan and undertake walking and urban realm outcome evaluations.

Table 12: Pedestrian movement analytical tools

Information that may be useful at an early stage in the design process	Suggested tools and techniques
Numbers of people walking and information about the characteristics of people walking	<ul style="list-style-type: none"> • Pedestrian flows and demographic surveys
Local attitudes to walking and the reasons why people are choosing not to walk	<ul style="list-style-type: none"> • Attitudinal surveys • Community engagement
Understanding how and where people move around on foot	<ul style="list-style-type: none"> • Mapping desire lines • Compliance with signals • Pedestrian delay analysis • Stationary activity analysis • Interaction surveys • Dynamic pedestrian modelling
Understanding the distribution of major local trip generators and their impact on walking behaviours	<ul style="list-style-type: none"> • Origin-destination mapping

6.3.1 Pedestrian flows and demographic surveys

Table 13: Overview of pedestrian flows and demographic surveys

Purpose	Issues that may be identified	Recommended application
To understand the general trends of pedestrian movement, supplemented with behavioural observations	<ul style="list-style-type: none"> • Footway and crossing capacity issues • Daily directional trends that may not be accommodated • Lack of inclusion for vulnerable user groups 	<ul style="list-style-type: none"> • Projects where changes to footways or crossings are expected • Projects where wider changes are expected to the environment, e.g. new retail, leisure or transport facilities

Pedestrian flow survey data is often required to assess the distribution and trends of pedestrian movement throughout the day and to provide data for assessing the performance of the street.

The purpose of the monitoring should determine how many counting points or 'gatelines' are needed and the extent of data collection required. Manual counts can be effective for short durations of ad hoc on-site monitoring; however for more extensive analysis and especially in busy areas, CCTV footage or mobile phone tracking can prove more efficient in capturing or estimating pedestrian flows.

The following suggested methods are based on guidance from TfL's 'Measuring Pedestrian Activity' document (2007). It is recommended to note down the location, duration of survey, time, date and weather, as part of the data collection process.

Selecting count sites – gatelines for counts should be planned to capture key links and crossings of interest within a site, while avoiding duplication where flows are likely to be the same at different points along a link. Gatelines should be representative of the link as a whole, by avoiding locating near to where there are significant changes in flow, such as next to a bus stop.

Directional / non-directional – depending on the detail that is needed regarding pedestrian

movement analysis, directional data can be useful to highlight daily flow trends. In many areas with commuter flows, there will be a tidal trend towards the city centre in the morning and away in the evening; however within the city centre itself, directional movements may be more balanced.

Duration and time of day – the length of time for undertaking a flow count impacts on the accuracy of the data, with the required degree of accuracy dependent on the proposed use of the data. For a quick, high level estimate, two one hour long counts spread out on a single weekday may be sufficient.

To enable a comparison between sites, it is recommended to count for every 5th 15-minute period between 07:00 and 19:00 on a single weekday.

To allow for a comparison between before and after layouts, it is recommended to conduct a full day assessment across 3 weekdays, from 07:00 to 19:00 or 22:00. On busy routes, it may be suitable to record flows using 5 minute counts every half an hour.

Days of the week – for weekday counts, it is recommended to only count on Tuesday to Thursday, as the most representative days of the week. For weekend counts, it is recommended to collect at least three days of data to provide a baseline.



Time of year – seasonal variation in pedestrian flows can be significant, and so counts should generally not be undertaken in school holidays. Where comparing before and after situations, the same month across different years should be used.

Weather – counts should generally not be conducted in wet weather as this can impact on pedestrian flows.

Ad hoc behavioural observations – noting trends for particular behaviours while on-site or as part of the quantitative data collection process can help to identify the type and scale of issues facing pedestrians, particularly when crossing the carriageway. Photography or video demonstrating particular behaviours can be an effective way of showing stakeholders the behavioural implications of the existing street layout.

Crossing behaviours which may be worth highlighting include looking at whether a high proportion of pedestrians:

- Hurry or run when crossing
- Look in the wrong direction when crossing
- Cross between vehicles; parked or stationary at traffic signals
- Cross in the shadow of a formal crossing
- Cross in multiple stages; some of which may not be in compliance with signals
- Try to cross the road informally, but then stop and try again elsewhere
- Choose to cross on the pedestrian countdown signal
- Leave a small gap between approaching vehicles or appear to misjudge the time needed to cross.

Pedestrian categorisation

Different types of pedestrians walk at different speeds and will exhibit different behaviours. It can therefore be useful to classify pedestrians when undertaking flow surveys. Below are some examples of recommended categories of people to collect data for, as part of a flow survey:

- Pedestrians with walking aids
- People with a visual impairment (using a white cane or with a guide dog)
- Children under 16 years of age
- Pedestrians pushing buggies or carrying babies

Additional demographics to supplement this data could include counts identifying gender, age and/or group size. This process of categorisation can be especially useful when applied to delay surveys; the pedestrian delay time should be noted for each group to provide a better understanding of how different categories of pedestrian experience different levels of delay.

Describing pedestrian flows

Pedestrian flows should be described based on peak periods, which may include the morning peak (07:00-10:00), interpeak (12:00-14:00), evening peak (16:00-19:00) or daily peak (07:00-19:00). To identify the peak hour for each period, a count is required using either a continuous count, or the 5 minute every half hour method.

Once flows are known, they can be compared with the pedestrian flow categories in Pedestrian Comfort Guidance, Appendix B. 'High flows' describe peak pedestrian flows above 1200 per hour; 'active flows' describes 600-1200 pedestrians per hour and 'quiet' is typically defined as less than 600 pedestrians per hour.

Using pedestrian flow data

At the local scale, pedestrian flows on adjacent streets can be used to infer movement trends between count locations, such as the relative number of pedestrians turning onto a side street compared to continuing straight ahead.

At the neighbourhood scale, this can go further to compare locations over time and see when there are peaks in pedestrian activity as part of daily flow profiles. This can be especially useful when directional flow data has been captured, showing whether there is tidal activity in pedestrian movement.

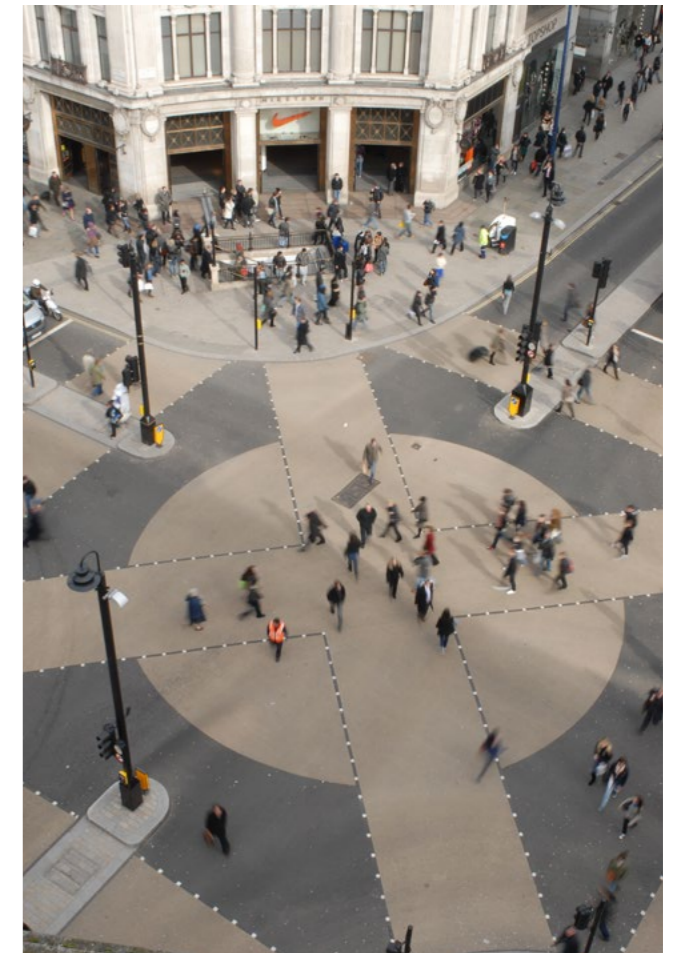
At a network level, pedestrian flow data can be used as a proxy measure for connectivity. Urban areas where there is a consistent ground floor density of land uses tend to have pedestrian flow levels that are proportional to the level of connectivity of the street network; i.e. higher pedestrian flows are often the product of good connectivity.

Identifying whether pedestrian flows are problematic

Where pedestrian flows are especially high, the quality of the pedestrian experience can be compromised. This is usually related to the amount of space available to allow for individual route choice.

The Pedestrian Comfort Guidance assessment should be used to determine the relationship of pedestrian flows to pedestrian comfort and can be used to highlight where pinch-points create issues for people walking.

Ad hoc observations can help to supplement this information, such as identifying where people tend to step out onto the carriageway to pass one another, or where static activities impact on footway capacity.



Oxford Circus was redesigned to better accommodate some of the highest pedestrian flows in London, by removing street clutter, widening footways and introducing an all green diagonal pedestrian crossing.

6.3.2 Pedestrian desire lines

Table 14: Overview of pedestrian desire line surveys

Purpose	Issues that may be identified	Recommended application
To understand localised pedestrian origin-destination movements and crossing desire lines	<ul style="list-style-type: none"> • Pedestrian movement trends such as a low use of existing formal crossings • Unsafe behaviours 	Projects where crossings will be changed and improved connections for pedestrians made

Pedestrian desire lines are the direct routes that people choose to take, usually the product of a range of environmental factors and shaped by the general arrangement of the street, land uses and trip attractors, as well as the actions and behaviours of other people.

Safety and maintenance issues can arise where a major pedestrian desire line has not been formally accommodated in the layout of the street.

Tracing pedestrian desire lines

In some places where there is a steady stream of pedestrian crossing movements, it will be relatively obvious where the main pedestrian desire lines are; while in other locations such as where there are sporadic flows associated with events or lower flows in general, pedestrian behaviours may be more difficult to identify. In these instances, a detailed origin-destination assessment, tracing pedestrian desire lines, should be undertaken to fully understand the range of complex pedestrian crossing behaviours to ascertain why people are choosing to cross where they are.

Initial studies can be done by observation, with individual pedestrian movements sketched onto a plan. Where appropriate, these can then be traced in a Geographic Information System database to build a picture of origin-destination behaviours.

Usually this is conducted across a localised area where a single camera or observer can see a complete movement, rather than trying to link trips across multiple camera angles.

In situations where the results may be contentious, disputed or counter intuitive, it is suggested that origin-destination surveys are recorded on video to be able to play back actual examples of crossing behaviours and to collect a large sample size. Typically the time allocation would be expected to be in line with the standard flow count methodology.



Tracing pedestrian desire lines shows where informal crossing movements are favoured.

Pedestrian desire lines can be used to inform the placement of formal crossing points to best support these organic routes, assuming that they can be safely provided for. They can also be used to inform the design of public space to minimise creating barriers for preferred routes.

It should be noted that desire lines for older and disabled people may be different to other people and based on factors not apparent in a standard GIS map; such as the availability of seating, level surface, public toilets etc. It is recommended to show desire lines for different user groups to provide a richer evidence base to base design decisions on.



Pedestrians may choose to cross in the shadow of a facility if it is not in the most convenient location.

Using pedestrian origin-destination surveys to inform design development

In the example opposite, it was proposed to move an existing crossing away from a junction to improve bus journey times and better serve pedestrian desire lines.

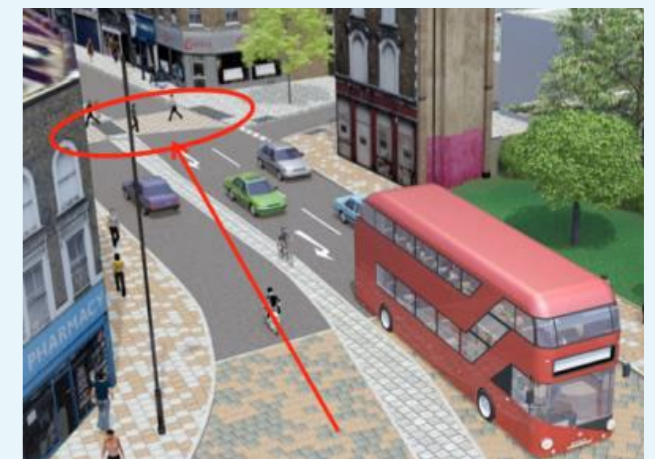
Pedestrian origin-destination surveys were undertaken tracking pedestrian movements across and beyond the junction.

The results suggested that a better crossing location would be at the adjacent junction, which currently does not have a crossing, to benefit more pedestrians.

This highlights the importance of understanding pedestrian movements across a wider area, rather than making assumptions on crossing behaviours based on the local geometry of a junction.



Existing crossing location (shown on proposed scheme)



Proposed location for new crossing based on pedestrian origin-destination data



6.3.3 Compliance with traffic signals

Table 15: Overview of compliance with traffic signals / pedestrian delay surveys

Purpose	Issues that may be identified	Recommended application
To determine the experience for people looking to cross the carriageway	<ul style="list-style-type: none"> High levels of delay at formal and / or informal crossing points Low levels of pedestrian compliance at controlled crossings 	Locations where there is anecdotal evidence of crossing issues

Unlike drivers and cyclists, pedestrians are under no legal obligation to obey the green walking pedestrian symbol at traffic signals as there are no jaywalking laws in the UK. They can and do cross on the red pedestrian phase by gap seeking and during 'intergreen' periods. Of course, at sites without a green pedestrian phase, this is the only way people can cross.

The extent that gap seeking occurs is site specific. At wide, busy and high speed locations, the level of gap seeking is low and pedestrian adherence to the green pedestrian phase is high.

At other sites, particularly those with central refuge islands, the level of gap seeking behaviours is high. This may not necessarily equate to this being deemed a risky behaviour; indeed the central refuge helps facilitate these movements.

Surveys can be designed to ascertain crossing compliance in relation to:

- Crossing during the green or red pedestrian phase
- Crossing in the shadow of a crossing (typically within 50m either side of the crossing)

Compliance results in isolation do not necessarily flag up reasons to change a facility; however when layered with collision data and other observational methods such as desire line tracing, can build a case for improving the design of the crossing facility.

6.3.4 Pedestrian delay

In order to assess delay it is important to understand how pedestrians cross the road.

There are three main ways that pedestrians cross:

1. Gap seeking



This is where pedestrians choose to cross between moving traffic; studies have shown that people are willing to accept gaps as short as 2 to 3 seconds while others will not cross where there is more than double this amount of time (The effect of traffic signal strategies on the safety of pedestrians, TRL, 2009).

2. Drivers stopping



Drivers stop and give way either because they are required to by law (at Zebra crossings and traffic signals), or because they choose to.

3. By critical mass

In very busy pedestrian environments such as Oxford Street or after major events, pedestrians will step into the road and benefit from a critical mass of people to force drivers to stop or slow down.

Ideally pedestrians should have minimal waiting times when crossing the road. The concept of delay to vehicles and buses is well established; however for pedestrians it is often overlooked. Pedestrian delay, or waiting time, is a good indicator of the level of service for pedestrians in crossing the road.

Longer wait times can cause crowding on footways, increasing the likelihood of pedestrians deviating from the defined crossing point and walking in the shadow of the crossing and between vehicles.

Measuring pedestrian delay

Existing layouts

At traffic signal sites where gap seeking is low and adherence to the green walking pedestrian symbol is high, pedestrian delay can be obtained using traffic signal timing information input into models such as a LinSig model. The model assumes a uniform arrival rate over an hour and works out the average time that a pedestrian has to wait for the green walking pedestrian symbol.

At non signalised and signalised sites where the level of gap seeking is high and adherence to the green walking pedestrian symbol low, a waiting time survey of pedestrians should be undertaken. Where there is a central island, the waiting time is the time spent at the side of the road and the island added together.

For Zebra crossings, driver compliance in the UK is generally high and pedestrian delay is expected to be low at these sites.

Proposed schemes

At signalised sites where adherence to the green walking pedestrian symbol is predicted to be high, LinSig can be used to measure pedestrian delay. At all other sites, pedestrian delay can be predicted using a microsimulation model such as VISSIM. By assessing pedestrian delay in this way, an objective assessment of the impact of schemes on pedestrians can be produced, in the same way that is common for motorised traffic.



6.3.5 Stationary activity analysis

Table 16: Overview of stationary activity analysis

Purpose	Issues that may be identified	Recommended application
To identify public space use and where people are choosing to dwell, as well as opportunities to prioritise investment	<ul style="list-style-type: none"> Low volumes of people dwelling in the space Poor distribution of people around the space 	<ul style="list-style-type: none"> Projects where there are high levels of stationary activity that adversely impacts on other pedestrian movements Projects where building frontages / land uses are changing Projects where there are expected changes to amenity and pedestrian provision on footways

Stationary activities include: sitting on formal seats and on café seating, sitting informally including on the ground, as well as standing, including people conducting commercial activities. Mapping these behaviours can build a picture of the functionality of the space and be used to identify how people choose to use the space, where pedestrian clustering occurs, and where activities create pinch-points and issues.

One to three snapshots of activity per hour across the public realm will provide a useful understanding of stationary activities. Seasonal variation and weather can significantly impact on

stationary activities; particularly dwell times and this should be considered in any assessment.

Mapping of these activities on Geographic Information Systems can help to illustrate key issues. Where these activities impinge on functional activities such as access to building entrances, a design measure may be necessary to encourage activities such as sitting in a more appropriate location. Designers may wish to further disperse activities to programme the space in a manner that enhances the efficiency of the street.



6.3.6 Interaction surveys

Table 17: Overview of interaction surveys

Purpose	Issues that may be identified	Recommended application
To understand behaviours by pedestrians and cyclists in environments where sharing occurs	<ul style="list-style-type: none"> Low levels of courteous behaviours being observed Sudden changes in direction required by both user groups 	Projects where there is an existing shared use footway or other locations where illegal cycling on footways is prevalent

Particularly useful for understanding situations where pedestrians and cyclists are using the same sections of public realm, interaction surveys can help to identify whether people are changing their behaviours to accommodate other users' needs.

Surveys are typically conducted over at least a 12 hour period using video footage as interactions may not happen especially often.

Data collection usually takes the form of people noticeably changing direction for one another and the severity of that change, i.e. a very sudden movement for a pedestrian or cyclist compared to a slight deviation to accommodate one another. Determining when there is an issue will depend on the severity and frequency of the interaction as well as perceptual safety issues.

A TfL study of uncontrolled crossings at bus stop bypasses led to the retrospective installation of Zebra crossings at all existing bus stop bypasses in London; a measure to enhance the understanding that pedestrians have priority at the crossing over people cycling.



6.3.7 Dynamic local pedestrian modelling

Purpose	Issues that may be identified	Recommended application
To predict pedestrian movement implications based on existing data and proposed public realm changes	<ul style="list-style-type: none"> Footway congestion hotspots Crossing waiting area impact on adjacent footway capacity 	Projects where there are transformative changes proposed in close proximity to major trip attractors

Where a design is proposing a transformative impact on the street and it is difficult to estimate the user implications, a dynamic local pedestrian model may be useful to predict patterns of pedestrian movement, pinch-points and congestion to inform the design process.

Dynamic models require a large amount of flow data and origin-destination information to build an accurate representation of existing conditions, so are generally only used in exceptional circumstances.

Software, such as Legion, Pedroute or VISSIM is used to create a micro-simulation of pedestrian movements, with individual entities mapped to show the density of pedestrian movements.

This process is usually applied across a localised junction area as large areas can result in too many assumptions being made as part of the model.

The design of the Oxford Circus diagonal crossing for example used this approach to understand cross-flow movements and the impact of waiting areas on the adjacent footway.

Contact TfL's Strategic Modelling team for specific enquiries relating to dynamic pedestrian modelling:
strategicmodelling@tfl.gov.uk

6.3.8 Attitudinal surveys

Purpose	Issues that may be identified	Recommended application
To collect user opinions on existing layouts and issues	<ul style="list-style-type: none"> Lack of provision for particular user groups Maintenance and condition issues 	All projects where anecdotal issues have been raised and the quantitative data is insufficient to make a design decision

Perceptual surveys are typically structured on a sliding scale to gauge satisfaction and can be presented either as a numbered or discursive scale, depending on the information that is required.

Data collection can involve intercepting people on-street to ask questions there and then, or participants may be provided with a flyer pointing them to an online questionnaire.

The flyer approach can be less resource intensive but may risk having a low sample size, so the choice of methodology should balance budget and purpose.

It is good practice to include an open ended interview question as well as a semi-structured format to provide useful user feedback and supplement quantitative data. Recording user demographics at the same time can help to understand the composition of the sample.

In relation to the Healthy Streets Approach, surveys have been applied taking into consideration user satisfaction levels, as shown in the table below. Subsequent perceptual surveys are recommended to be structured around these established measures and may be useful as a before and after study.

Easy to cross	<ul style="list-style-type: none"> Ease of crossing road in local area Number of traffic lights for pedestrians
Shade & shelter	<ul style="list-style-type: none"> Ease of finding shade and shelter in local area
Places to stop and rest	<ul style="list-style-type: none"> Ease of finding somewhere to sit and rest
Not too noisy	<ul style="list-style-type: none"> Noise levels in streets in local area
Things to see and do	<ul style="list-style-type: none"> Attractiveness of streets in local area Enjoyment of streets Trees, plants and green spaces in local area
People feel relaxed	<ul style="list-style-type: none"> Ability to easily move about How clean footways are



Chapter 7 - Bringing it all together

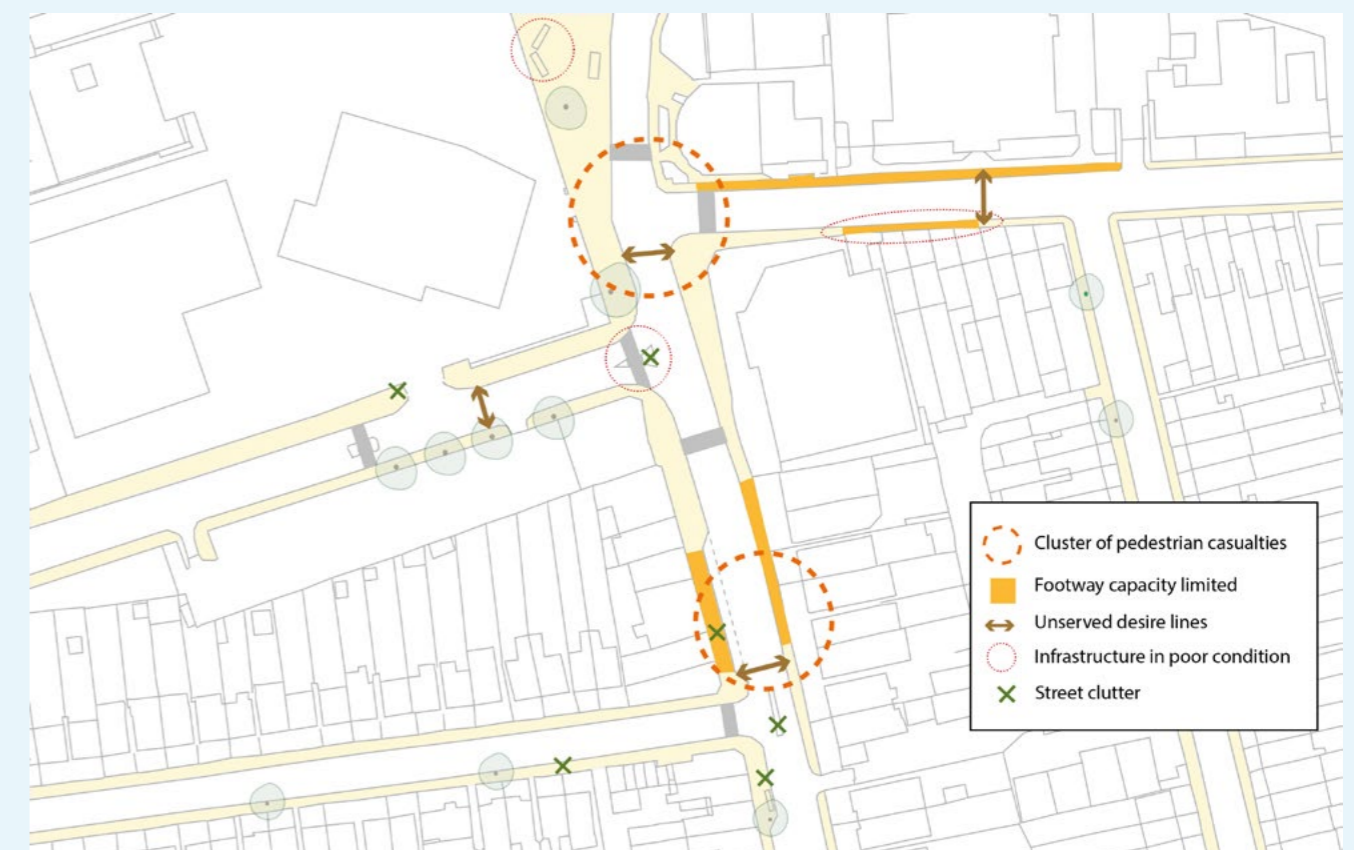
The long list of tools should be filtered and applied as appropriate for the scale of the project to identify and illustrate key issues relating to a particular area. This approach can then assist in developing ideas for how localised interventions can contribute to overcoming these issues.

7.1 Combining datasets into a summary of key issues

Describing the strengths and weaknesses of a study area in relation to the seven Pedestrian Network Design Principles can be a useful way of bringing together various aspects of the analysis into a cohesive identification of key issues. This would benefit from being presented spatially on a single map to draw together a summary of key issues, including local knowledge collected in stakeholder engagement sessions.

Mapping of opportunities that benefit the wider area and linking these to potential delivery issues can be a practical next step to directly address key issues for walking.

This process may include a benefit cost appraisal looking at journey times and safety, among other measures to determine a preferred design option. It is recommended to engage local stakeholders again at the design optioneering stage, where several options may remain in contention.



Example of a key issues map to inform the drafting of the design brief



7.2 Cross-checking key issues with the Pedestrian Network Design Principles

By linking the key issues and options back to the Pedestrian Network Design Principles, a focused approach for providing improvements for walking should emerge, which may include providing:

- New crossing points
- Footway widening
- New footpaths
- Enhanced gateways and arrival points to a defined area
- Wayfinding elements
- Filtered permeability to reduce through traffic or complete pedestrianisation of a street
- Carriageway surface treatments to reduce traffic speeds
- Improved kerbside management, such as car parking rationalisation
- New street furniture such as seating to enhance the functionality of a space
- Pedestrian bridges and/or ramps.

Not all intervention options may be practical or mutually beneficial with one another. The relative benefits of these interventions should be assessed in combination by relating their potential benefits back to the key issues, as well as the wider policy context and community priorities.

It may be beneficial to use the seven Pedestrian Network Design Principles as part of this review process, to help define the scope of works for a specific scheme.

7.3 Writing an evidence based design brief

Once a project has been agreed, usually based on a consideration of strategic and local priorities, the design brief will need to reflect the background reasons for delivering a project that is intended to make improvements for walking, setting out the spatial scope, key issues and the main objectives for the scheme. This process should draw on the data collected through the application of the various analytical approaches and tools listed in this document, as well as other tools and processes that are proportionate to the scope of works for other transport modes, which will inform the traffic management objectives for the scheme.

It is vital that the design brief is sufficiently detailed in identifying the key issues for pedestrians to focus the objectives of the project in a quantifiable way and ensure the scheme can deliver against defined priorities that are aligned with the Healthy Streets Approach.

An understanding of modal priorities should be recognised and the objectives balanced to ensure that the focus on pedestrians is proportionate and appropriate to the context.

To avoid a dilution of the scheme brief, Project Managers should set out the requirement for the use of tools such as the Healthy Streets Check for Designers, Equality Impact Assessment and the seven Pedestrian Network Design Principles within the design brief itself, to ensure an ongoing review process is in place that maintains an understanding of how the pedestrian environment is being changed.

7.4 Trialling Options

Trials of design options at a 1:1 scale can be used to test and evaluate the impact and functionality of different layouts in situ. The use of temporary, light touch and low cost projects that change the way a place looks and feels can have a big impact on people's lives and may be the first step towards more permanent change.

Trials allow people to directly experience what a permanent project might feel like which can be a powerful tool in showing the potential of using streets and public spaces for uses other than moving cars.

Temporary trials can be effective in gaining community buy-in to a scheme, and they allow the collection of data about how a design functions before committing to a permanent layout.

Collecting data before and after a trial allows for a comparison to a baseline which can help to prioritise design decisions.

Some examples of trials for pedestrian friendly designs may include:

- Use of planters or other objects in the carriageway to trial a road closure or series of road closures (also known as 'filtered permeability')
- A one day closure of a street for a community festival
- Taking over a parking space to create an area with seating and planting (also known as a 'parklet')
- A trial 20 mile per hour zone
- Highlighting new uncontrolled crossing points on desire lines by use of paint or design on the carriageway
- Using hay bales for indicative seating points
- Using chalk markings to demarcate new footway layouts.

An Experimental Traffic Management Order (ETO), made under Sections 9 and 10 of the Road Traffic Regulation Act 1984, is a useful tool when planning to trial infrastructure. An ETO is a type of traffic order that can impose traffic and parking restrictions or change the way existing restrictions function on a street. It allows a designer to try things out often using temporary materials, with an option to make a scheme permanent after 18 months.

Detailed guidance on running temporary trials can be found in TfL's guidance:

'Small Change, Big Impact'



7.5 Delivering the design brief

For the majority of projects which involve improvements to existing streets, the highway authority acts as the scheme designer and the planning body.

Once a design brief has been developed and the concept design is underway, it is recommended to assess how different design options relate to the Pedestrian Network Design Principles set out in this document. Streetscape Guidance and/or local design guidance documents should be referred to for detailed infrastructure design advice.

A range of audits may be carried out to assess the compliance of an emerging design with the project objectives and satisfy planning. These may include:

- a Road Safety Audit to report on potential safety issues and ensure an independent review process is conducted that helps shape and justify the design
- a Design and Access Statement to show how a new development is suitably arranged to benefit all users
- a Transport Assessment to identify the transport implications of a new development and ensure a Healthy Streets Approach can be delivered

- an Equality Impact Assessment to show due regard for all users and particularly people with the characteristics that are protected by the Equality Act
- an Environmental Impact Assessment to consider a range of cross-cutting factors relating to ecology, air quality, townscape and heritage and to mitigate the severity of adverse impacts through the design process
- a Healthy Streets Check for Planning Application assessment to review proposed developments against the Healthy Streets Approach and ensure compliance with London Plan policy. Contact TfL Spatial Planning spatialplanning@tfl.gov.uk for more information
- TfL Engineering assurance processes are required for all projects on the TLRN and / or where signal design changes are proposed.

Ultimately the success of any project that seeks to provide benefits for pedestrians depends on the effective use of data to identify key issues and ensure that the design brief is sufficiently detailed and focused on positive walking outcomes to drive the project forward and deliver in line with the best practice design principles set out in this toolkit.



PART D. Case studies

The following case studies are examples of schemes where the Pedestrian Network Design Principles have been implemented successfully alongside other transformative benefits.

1. New Park Road, Lambeth
2. Walk Elephant, Southwark
3. Tower Bridge Road, Southwark
4. Marks Gate, Barking and Dagenham
5. Hornchurch, Havering
6. Hoe Street / High Street, Walthamstow
7. Archway, Islington



8.1 New Park Road, Lambeth

Lambeth Council and TfL delivered a scheme to reduce road danger, traffic levels and traffic speeds outside Richard Atkins Primary School on New Park Road in 2016.

Space was re-allocated from vehicles to pedestrians by developing a chicane style layout, with circular build-outs, planters, trees and bike stands. Parking spaces were also removed and a 20mph speed limit introduced. The total cost of the scheme was £200,000.

The layout was designed by Sustrans in collaboration with the school and local residents using a community street design process.

Temporary materials were used to transform the street for the day at the end of this process, to allow local people to experience the new layout and feedback their views.

Pedestrian Network Design Principles	
Safe	Horizontal deflection and raised road levels aim to slow traffic and reduce road danger.
Inclusive	Tactile paving and flush dropped kerbs on built-outs are introduced where the crossing distance is shortest.
Comfortable	Build-outs provide greater space for pedestrians.
Direct & Connected	Multiple informal crossing points have been created outside the school.
Legible	Informal coloured circles and markings on the carriageway highlight that this is a space which should not operate as a normal carriageway and priority should be given to children in particular.
Attractive	The shapes in the layout, the circles of colour, and new trees make the street more playful and attractive.



During the trial
(courtesy of Sustrans)



After
(courtesy of Sustrans)

8.2 Walk Elephant, Southwark

Walk Elephant is changing perceptions of Elephant and Castle from a car-dominated town centre to a green, pleasant space a short walk from the Thames and central London. It has created new walking routes for people to take on their way to work, the shops or home and discover local hidden gems.

Launched in spring 2017, Walk Elephant is a community initiative to improve walking routes across the Elephant and Castle area. Inspired by similar, community-led projects – such as East Walworth Green Links, which created a high-quality route connecting the town centre with Burgess Park – the initiative was kick-started by a series of local walks.

Residents took part in these walks to identify potential improvements to help people walking, such as new crossings, better landscaping or clearer signage. This was part of an immersive consultation with fun events and other ways to submit ideas, for example using Commonplace and Spacehive.

These enhancements were plotted on a communal map, and now Southwark Council is helping to bring these ideas to life by seeking support and funds from a variety of sources, including local property developers.

Pedestrian Network Design Principles	
Safe	Traffic calming measures and brightening of underpasses is designed to reduce road danger and make people feel safer.
Inclusive	Features such as new dropped kerbs allow for improved access and crossing points.
Comfortable	Additional footway space and filtered permeability creates more dedicated space for pedestrians.
Direct & Connected	Opening up new walking links has been delivered by removing fencing.
Legible	Wayfinding signposts and use of Walk Elephant branding helps to create a sense of local identity.
Attractive	New surfacing, greening and community planting enhances the visual appeal of the street.



After - Filtered permeability and new planting at Lamlash Garden



8.3 Tower Bridge Road, Southwark

Transport for London delivered a £1.5m improvement to the Transport for London Road Network at Tower Bridge Road in 2015.

A new public space was created between the main road and Bermondsey Street by removing car parking and repaving the footway. This space was complemented by a new statue of a local WWI naval hero Albert McKenzie, who was the first London sailor to be awarded a Victoria Cross by King George V.

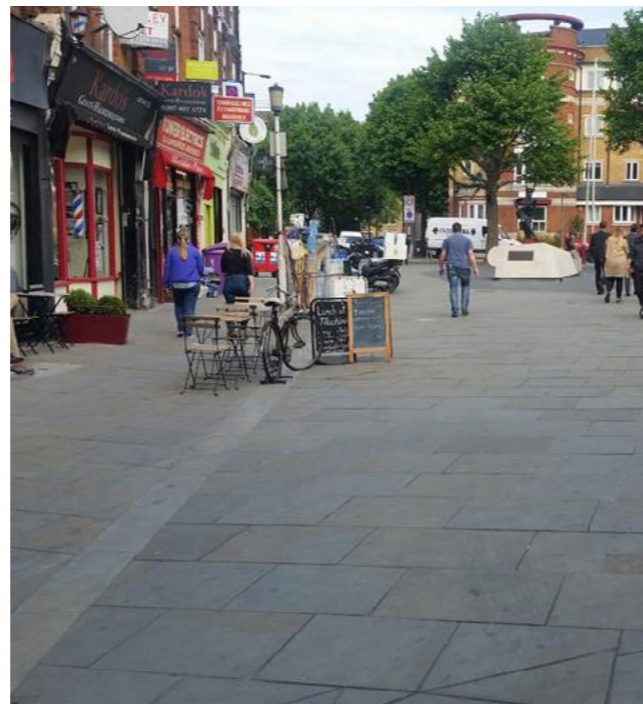
A diagonal crossing was implemented at the junction of Tower Bridge Road, Bermondsey Street and Grange Road as well as widened crossings.

The improved environment for people walking was continued along Tower Bridge Road with raised entry treatments at side roads, upgraded street lighting, and improved bus stops with new bus shelters.

Pedestrian Network Design Principles	
Safe	Raised side road entry treatments reduce vehicle speeds and help to indicate greater priority for pedestrians.
Inclusive	New seating and improved bus stops including bus shelters, provide additional rest points for pedestrians.
Comfortable	A road closure has enabled a new public space to be created giving significantly more footway space for people walking.
Direct & Connected	A diagonal crossing at the main junction allows for a more direct walking route.
Legible	The road closure helps create new public space that is clearly designated to pedestrians.
Attractive	The widened public space is used by cafés for seating and additional features have been provided such as a memorial statue.



Before



After - A new multi-functional space has been created which can accommodate local events

8.4 Marks Gate, Barking and Dagenham

Marks Gate, a housing estate in the London Borough of Barking and Dagenham, faced a number of transport related challenges: severed from the rest of the borough by the A12; and with access by foot and bike limited to subways under this busy road.

The Sustrans project was commissioned by the London Borough of Barking and Dagenham as part of their pioneering approach to regeneration.

Working closely with the community, the project combined community-led street design, behaviour change and infrastructure improvements with the aim of increasing opportunities for walking and cycling. Infrastructure changes to the high street and to the school's entrances have made the area safer and more sociable for all.



Before (top) and After (below) - Decluttering with shopfront improvements (courtesy of Sustrans)

Pedestrian Network Design Principles	
Safe	New crossing points were installed aligned to pedestrian desire lines, resurfacing of footways, traffic calming measures and car parking was rationalised on the high street.
Inclusive	An involved community engagement approach included pop-up workshops and a street audit carried out with Barking and Dagenham access group to assess usability issues for disabled people. The parent teacher association came up with the yellow brick road concept and local children designed the mosaic flagstones as well as the 20mph signs.
Legible	Additional wayfinding signage was employed and directions to a local park applied to the design of shop shutters.
Attractive	Public art was introduced at a number of sites: on the local shop shutters and in the underpass with a mural and anti-graffiti paint. Decluttering of street furniture, including guardrail removal, enhanced the streetscape and upgrades included painting of the guardrailing outside the school, tree planting and a community garden.



After - Wayfinding signage combined with affordable art installation (courtesy of Sustrans)



8.5 Hornchurch, Havering

A £2.5m renovation scheme by the London Borough of Havering has transformed Hornchurch town centre – tackling its issues of traffic congestion, poor levels of personal safety and a tired public realm.

A significant feature of the redevelopment was the variety of improvements made for pedestrians. Guardrails were removed, crossings were placed on desire lines, footway widths were increased and a central continuous walking strip was created to aid informal crossing.

Social spaces were improved through the addition of new lighting, wayfinding, planting and street furniture. Bus stops were renovated and traffic flows reduced, improving conditions for cyclists. Annual health benefits of £535,000 are estimated to be the result and the scheme was awarded a Highly Commended Urban Transport Design Award in 2014.

Pedestrian Network Design Principles	
Direct	Through the provision of courtesy crossings and the median strip, which allows pedestrians more opportunities for crossing directly.
Comfortable	Wider footways and new open spaces allow for greater pedestrian capacity.
Inclusive	Colour contrasting materials applied to delineate footways, with new blister tactile paving at crossings and carefully aligned street furniture.
Legible	A distinctive look and feel to the street reduces vehicle dominance and increases pedestrian priority.
Attractive	Good quality surface materials and greening improve the area's appearance, supporting local businesses during the daytime and restaurants in the evening, boosting the night-time economy.



Before



After

8.6 Hoe Street / High Street, Walthamstow

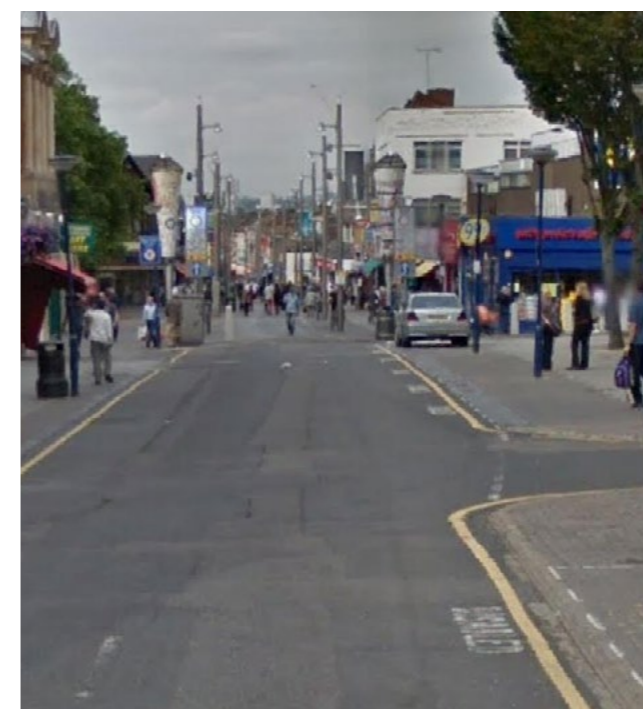
Walthamstow's town centre has been transformed thanks to a partnership not just between TfL and the London Borough of Waltham Forest, but with the active participation of local businesses as well.

When the borough and TfL embarked on a £2.6m project to regenerate part of Hoe Street they sought to involve the street's traders, encouraging them to give their premises a facelift.

Four designers worked with 40 businesses to carry out light-touch improvements to their shop fronts. Six of the shops, located in prominent positions or with notable architectural features, were given more extensive treatments.

Improvements to the street itself included resurfacing, de-cluttering, new wayfinding elements and artwork. At the same time, a new development, called The Scene, brought a further uplift to the area around the junction of Hoe Street and High Street, with a shared space approach adopted at street level. New trees, planters, seating and lighting were also installed along the High Street.

Pedestrian Network Design Principles	
Safe & Legible	The look and feel of the area has reduced vehicle dominance and raised pedestrian priority.
Inclusive	The level surface has colour contrasting comfort zones, tactile paving at the controlled crossings and carefully aligned street furniture.
Comfortable	The open layout can now comfortably accommodate high pedestrian flows across the full width of the street.
Direct	Improved direct access to shops has been accommodated as part of the scheme.
Attractive	Good quality surface materials and greening improve the look and feel of the area. Local businesses and restaurants have been boosted by the regeneration.



Before



After

8.7 Archway, Islington

Dominated by a busy one-way traffic gyratory, the centre was fragmented and effectively ‘marooned’ by three lanes of traffic, making it difficult for pedestrians to reach shops and other amenities.

A £12.6m project by TfL and the London Borough of Islington has transformed the area, replacing the gyratory with a re-directed two-way traffic route and creating an attractive public space, safer cycle lanes and improved pedestrian crossings.

The new layout has reconnected shops and businesses and provided dedicated cycle routes separated from motor vehicles. It has also created a vehicle-free open space outside Archway Tube station and unlocked a site for development of affordable homes.

Pedestrian Network Design Principles	
Inclusive	Use of tactile paving, carefully aligned trees and street furniture contributes towards being accessible for all.
Comfortable	Widening footways and public open space to provide higher capacity for walking.
Direct & Connected	New crossings are provided on pedestrian and cyclist desire lines.
Legible	Reduced street clutter and the use of contrasting surfacing for cycle tracks to enhance the clarity in use.
Attractive	Good quality surface materials and greening designed to create a more attractive and vibrant community space that is now used for a regular market.



Before



After

Referenced documents

Transport for London documents

- Strategic Walking Analysis (2020)
- Achieving Lower Speeds: the toolkit (2019)
- Streetscape Guidance (2019)
- Transport Assessment Guidance (2019)
- The Walking Action Plan (2018)
- The Vision Zero Action Plan (2018)
- Temporary Traffic Management Handbook (2018)
- The Guide to Healthy Streets Indicators (2018)
- The Healthy Streets Check for Designers spreadsheet tool (2018)
- Small Change, Big Impact (2017)
- Assessing Transport Connectivity in London (2015)
- Road Task Force Report (2013)
- PERS factsheet (2010)
- Pedestrian Comfort Guidance (2010)
- Measuring Pedestrian Activity (2007)
- Casualties in Greater London factsheets

Other referenced documents

- The London Plan (GLA, 2020)
- The Mayor’s Transport Strategy (GLA, 2018)
- Good Growth by Design (GLA, 2018)
- Inclusive London (GLA, 2018)
- Global Street Design Guide (Global Designing Cities Initiative, 2016)
- Guidance for the analysis of STATS19 contributory factors (TRL, 2015)
- The Equality Act (UK Government, 2010)
- Inclusive Mobility (DfT, 2005)
- Guidance on the use of Tactile Surfaces (DETR / DfT, 1998)



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