Interchange Best Practice Guidelines

Comprehensive guide 2021

MAYOR OF LONDON

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

Contents

Introduction

The Interchange Best Practice Guidelines have been designed to provide advice and guidance to those involved in improving the quality and efficiency of interchanges at the early stages of project conception.

London has around 600 rail stations that involve multi-modal interchange between various combinations of walking, cycling, bus, taxi, Tube, rail, light rail and tram. We have a unique part to play in ensuring that all our customers using any transport mode in London are treated equally and fairly at all stages of their journey.

Our Growth and Interchanges team monitors both significant new transport initiatives or improvements, and land use developments, in order to identify any interchanges that require a more coordinated approach. We also work with stakeholders, for example local authorities, to ensure that schemes integrate policies such as those outlined in the Mayor's Transport Strategy, with local plans delivering benefits to the community.

People want to live and work in places that are well connected

Mayor's Transport Strategy 2018

Our portfolio of programmes ranges from supporting smaller but locally important interchange improvements that can make a real difference to customers and their neighbourhoods – to those interchanges where major transport developments can have a significant impact on customers, for example Crossrail and the devolution of rail services to us. Interchange programmes often include multiple projects, including both transport and land use initiatives. They are funded by a variety of public and private sector organisations, including commercial developers and the London boroughs.

Additional details and the full Mayor's Transport Strategy 2018 can be found on our website.
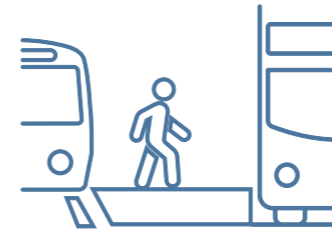
Interchange:
The act of transferring between modes
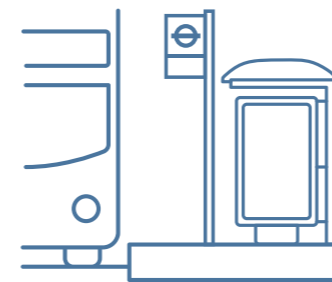
Interchange facility:
A purpose-built facility where interchange takes place, such as a railway station, bus station or bus/tram stop

Interchange zone:
A wider area encompassing one or more interchange facilities, creating a multi-modal hub, and public spaces

Transport and interchange objectives

The role of public transport is to meet the social, economic and environmental needs of a city, providing customers with more active, sustainable and appealing travel choices by:

- Meeting the increasing demand for travel by public transport

- Providing safer and more secure journeys

- Reducing car dependency by providing viable attractive alternatives

- Easing congestion and tackling climate change by promoting more sustainable modes

- Providing links between neighbourhoods, employment, education and other opportunities

- Improving quality of life by improving air quality, and reducing noise and other environmental impacts

- Acting as a catalyst for socio-economic and physical regeneration in local communities

- Supporting future growth and generating revenue to fund projects

- Creating more attractive buildings, public spaces and enhancing the sense of place

- Designing inclusively to enable everybody to access the transport system, whatever their ability or personal circumstances

Interchanges link London's public transport services together to form a network, and are an essential part of the whole journey experience. In 2019/20, 37 per cent of all public transport trips in London had more than one journey stage These interfaces need to provide a smooth transition for customers, accommodate the needs of each mode and demonstrate good practice. If transfers between transport services can be made easier, quicker, and more convenient, travel opportunities for existing and new customers will emerge that are better, more frequent and wider ranging, with travel horizons broadened.

Considering the challenges

The Interchange Best Practice Guidelines aim to inspire everyone to deliver best practice wherever possible. Following the guidance, which is intended as a practical tool, involves addressing various challenges, such as:

A crowded transport network

An increasing demand for travel

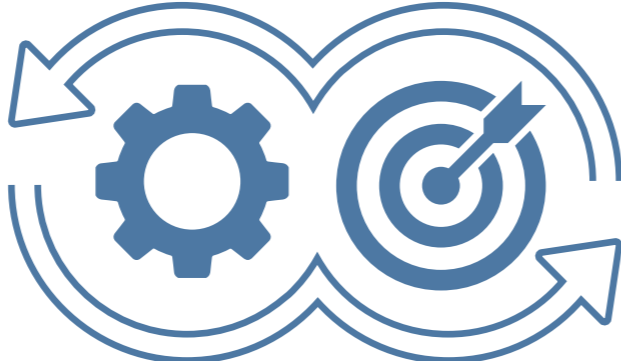**Protecting the built and natural environment**

Working within a complex transport industry

Differing needs of customers, staff and communities

Different objectives, priorities and processes of delivery partners

Spatial and other constraints imposed by the London's heritage and transport network

Limited financial and human resources

A common evaluation framework

Each delivery partner and stakeholder organisation is likely to have differing objectives and priorities and, as a result, will have different approaches to evaluating interchange schemes. However, organisations may share some common objectives, particularly in how they can support wider policy goals such as economic growth, environmental protection, social inclusion and socio-economic and physical regeneration. Shared objectives should be identified at an early stage as they play an important role in shaping the design of the planned changes.

All organisations involved should work together to identify common inputs into the evaluation process, such as forecast customer numbers or costs, even if these inputs are subsequently treated differently. In this way, consistency can be maximised and resources shared.

It is the role of the project leaders to ensure the work undertaken by different stakeholders complies with project management structures such as TfL Pathway, PACE (Project Acceleration in a Controlled Environment) used by Network Rail, and the RIBA (Royal Institute of British Architects) Plan of Work.

Project management structures

TfL Pathway	PACE	RIBA Plan of Work
Stage 0 Initial proposition	**Phase 0** Project initiate	**Stage 0** Strategic definition
Stage 1 Outcome definition	**Phase 1** Strategic development and project selection	**Stage 1** Preparation and brief
Stage 2 Outcome selection		**Stage 2** Concept design
Stage 3 Concept design	**Phase 2** Project development and design	**Stage 3** Spatial coordination
Stage 4 Detailed design		**Stage 4** Technical design
Stage 5 Delivery	**Phase 3** Project delivery	**Stage 5** Manufacturing and construction
Stage 6 Project close	**Phase 4** Project close	**Stage 6** Handover
		Stage 7 Use

Between modes

The areas between transport modes are an essential part of the whole journey experience. They need to provide a seamless journey and a clear transition for passengers using transport facilities, accommodate the needs of each mode and demonstrate good practice.

As walking is the key element for moving between modes, these transition spaces can provide multiple functions to create enjoyable spaces such as retail, green spaces and seating areas.

To ensure a smooth transition, each mode should work together to deliver a good transport experience. This can be achieved by collaborating with relevant stakeholders such as local boroughs and other transport operating companies.

This can also be accomplished by implementing guidance specific to each mode of transport in order to produce a cohesive interchange network. Project leads must consider and take advantage of any differences in individual project time frames. For example, can signage and cycle provisions be updated during works for the public realm?

A dedicated Streets toolkit page on our website provide links to the following guidance.

Healthy Streets

The Healthy Streets Approach – a key priority in the Mayor's Transport Strategy – is a system of policies and strategies to help Londoners use cars less, and walk, cycle and use public transport more.

The Mayor's Transport Strategy sets out the ambitious aim that 80 per cent of total trips in London should be made by walking, cycling and public transport by 2041. As interchange hubs play a key role in the whole customer journey experience, it is important to adopt Healthy Streets objectives that can support projects to deliver these improvements.

If a new development is likely to severely impact transport within an area, a Transport Assessment is required to ensure a planning application demonstrates how the new development supports the Healthy Streets Approach. It also helps us to assess the application and gives both the developer and local borough advice on how it fits with the London Plan, a framework that describes how London will develop over the next 20 to 25 years.

Healthy Streets Indicators

01 Pedestrians from all walks of life

02 People choose to walk, cycle and use public transport

03 Clean air

04 People feel safe

05 Not too noisy

06 Easy to cross

07 Places to stop and rest

08 Shade and shelter

09 People feel relaxed

10 Things to see and do

Interchange zones

While there are many purpose-built interchange facilities in London, interchanging frequently takes place at locations where few formal facilities exist. For example, a suburban railway station with bus stops, a car park or a nearby taxi rank is an informal interchange zone.

Interchange zones often comprise spaces that fall within the control of several different organisations, and where public transport operators may have little direct control over management of the space,

for example at clusters of on-street bus or coach stops. In many cases, the public highway, managed by ourselves or the borough, is the 'glue' joining the public transport modes together. Transport providers should work with boroughs to define the scope of the interchange zone.

An interchange zone is often a gateway to the public transport network in that it represents the interface between public transport services and the surrounding area. This includes connections by the

most common mode of access, walking, but can also include provision for access by bicycle, cycle hire, bike sharing, taxi, bus or even private car.

At the core of the interchange zone, the function of the public space may be strongly influenced by its role as a connection between public transport and feeder modes. At the periphery, an interchange zone may simply be the catchment from which customers are drawn.

To help planners and designers identify the impact that interchange functions place on different public spaces within an interchange zone, spatial management guidelines have been set out. These guidelines will help optimise the quality of the interchange zone and customer functions, resulting in improved efficiency. In so doing, consideration should be given to the differing needs of those using the space and the activities going on there, both relating to interchanging or otherwise.

Interchange spatial management

To reflect the complexity of interchange zones, these guidelines divide the different spaces within the interchange zone into three types: decision spaces; movement spaces; and opportunity spaces.

When designing or improving an interchange facility or zone, the spatial management principles should be applied at brief development stage, and then considered throughout the design development to evaluate design concepts against anticipated needs. The attributes of these spaces are defined as follows:

Decision spaces

Decision spaces are areas where customer decisions take priority: examples include decision points such as entrances or corridor junctions. At these locations, there should be good sight lines, and clear signage or transport information. There should be no non-essential physical infrastructure or visual distractions such as advertising, retail or other land uses that would serve to distract or confuse customers.

Operation room

Retail

Underpass

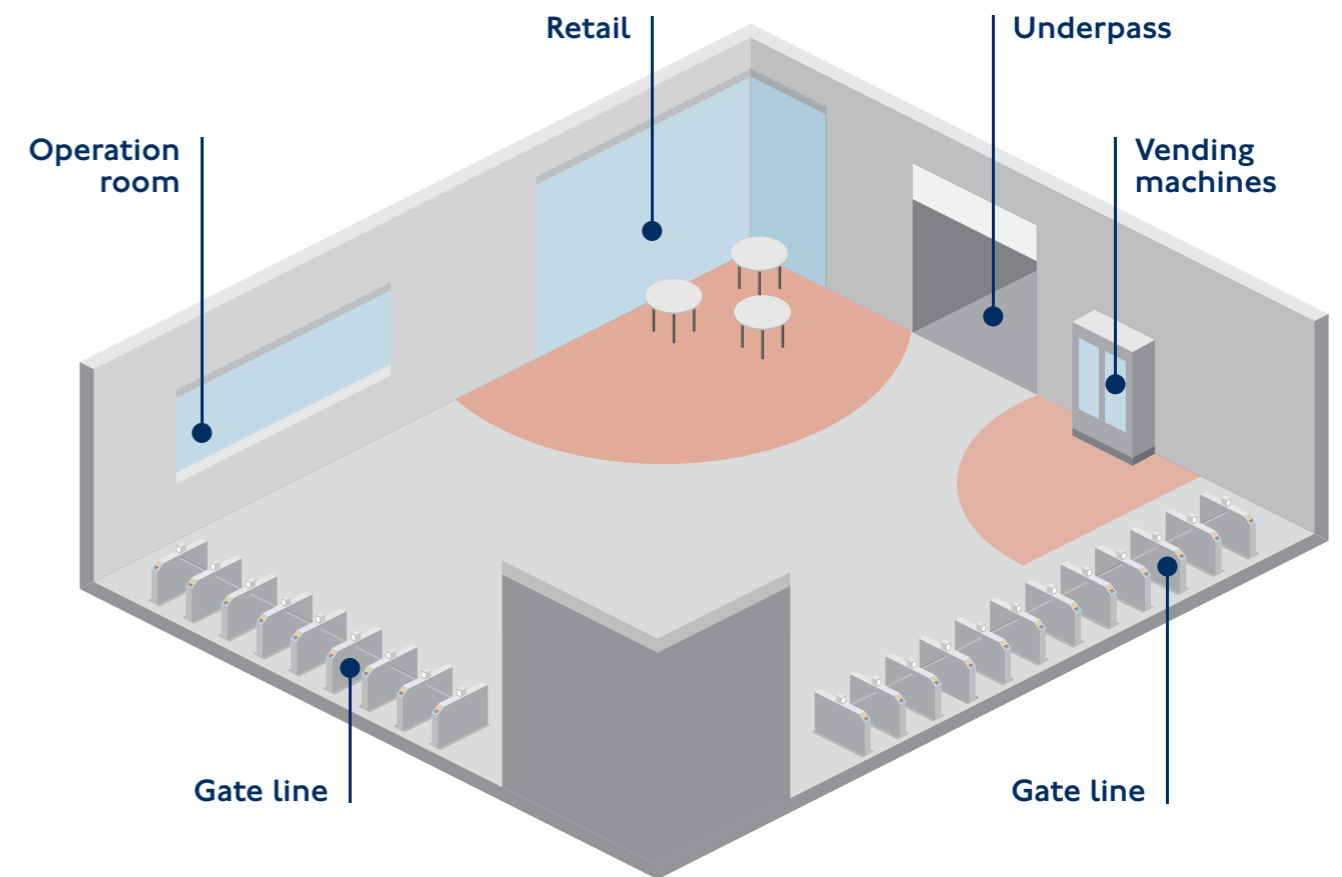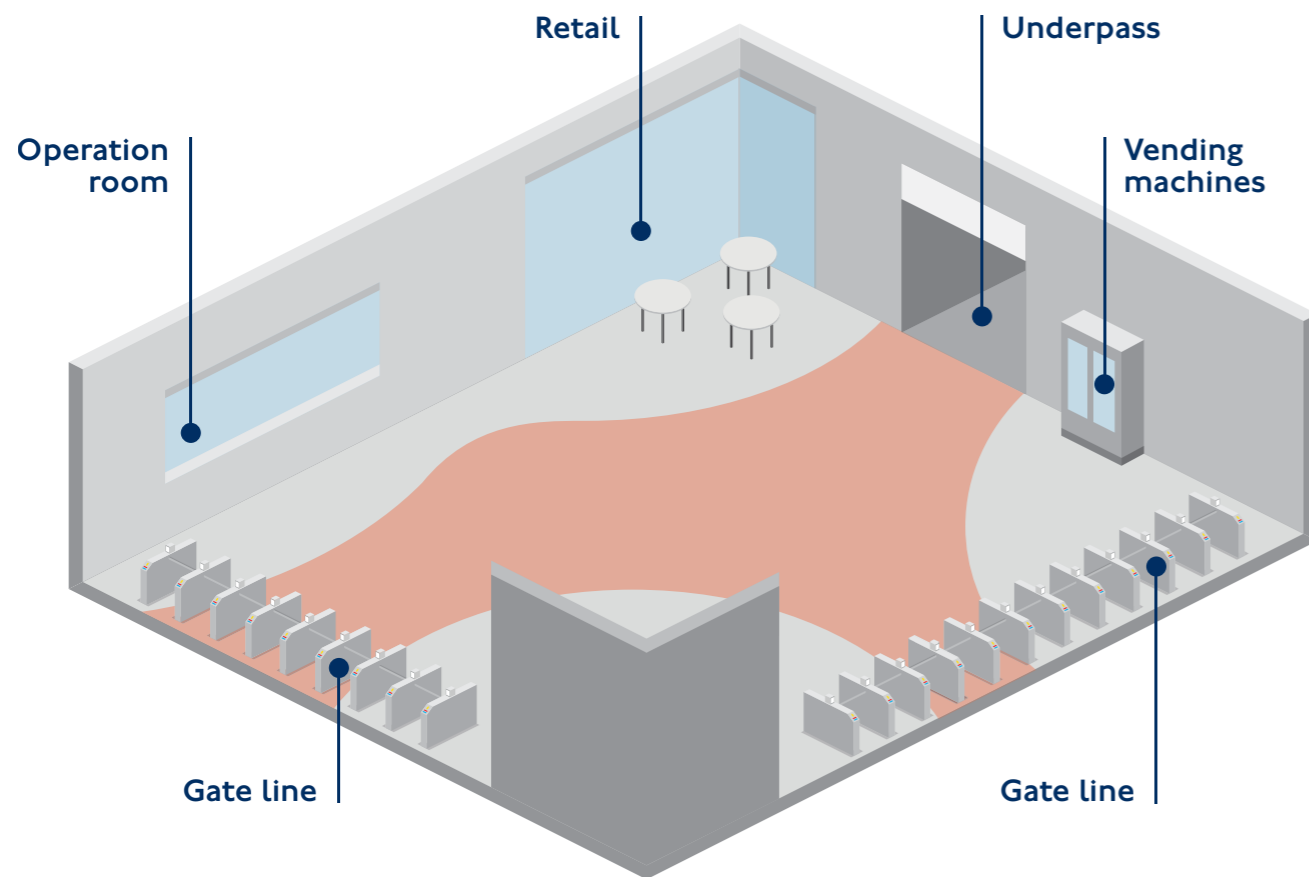Vending machines

Gate line

Gate line
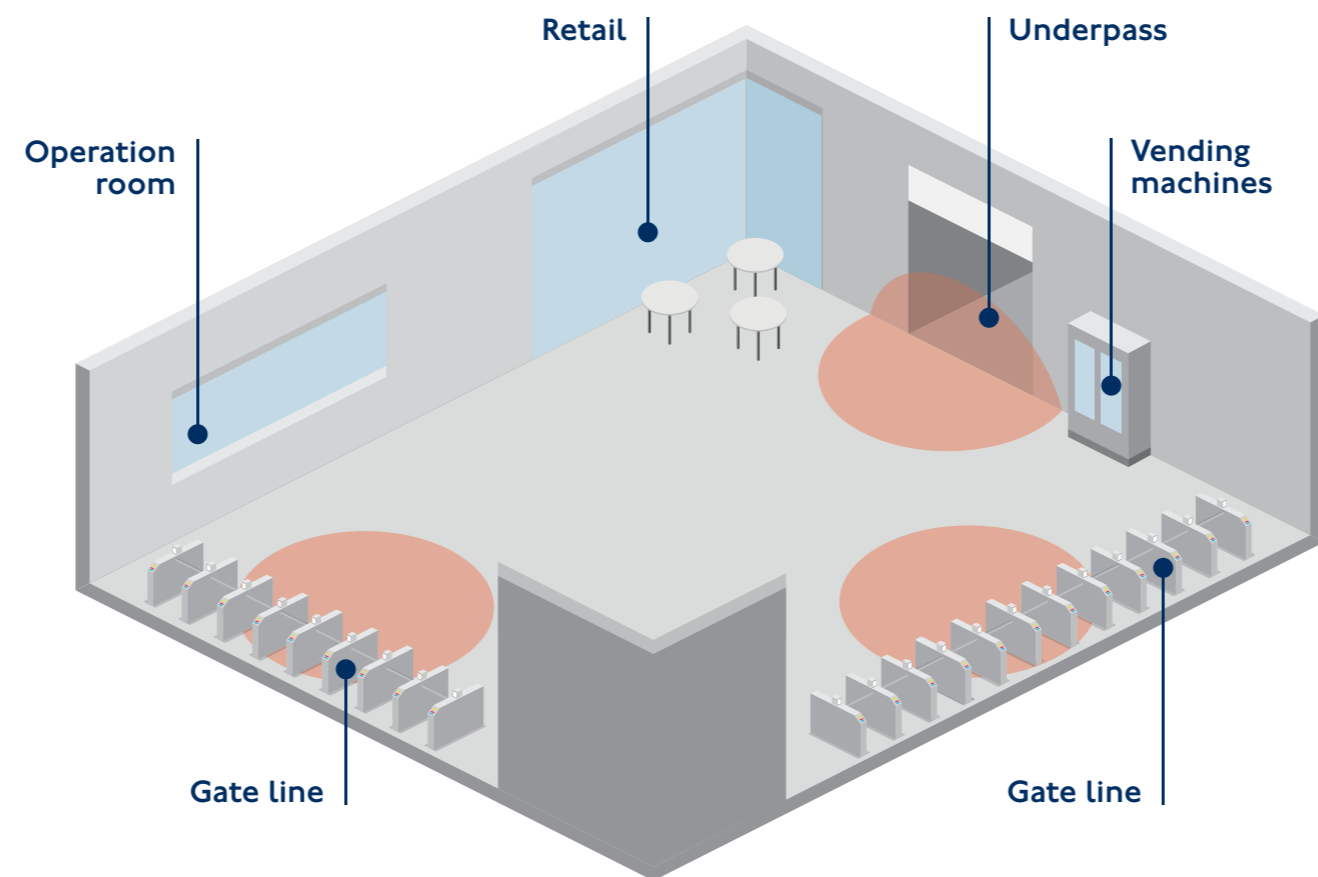
Movement spaces

Movement spaces connect decision spaces. Typically, they include corridors and paths specially reserved for customer movement and connections to/from/between transport modes or the surrounding area. These spaces should provide clear, unobstructed routes, matched to desire lines. Street furniture, plantings, advertising, information displays, retail boards or any other fixed items should not protrude into these zones, but may be located adjacent to them.

Opportunity spaces

Opportunity spaces include those areas of the interchange zone outside the core corridors of decisions or movement. They can accommodate cafés, retail entrances, retail display, seating or landscaping. Street furniture, advertising or other fixed or temporary infrastructure located in these zones must be managed so as not to protrude or interfere with the requirements of decision or movement spaces in adjacent areas.

Retail

Underpass

Operation room

Vending machines

Gate line

Gate line

Retail

Underpass

Operation room

Vending machines

Gate line

Gate line

Stakeholders – who needs what?

Different parties have different requirements from an interchange, as follows:

Commuters

The interchange must:

- Be fully accessible
- Offer maximum convenience
- Offer minimal journey times and distances
- Reliable
- Give real-time information
- Be safe
- Be free from customer congestion
- Offer convenience shopping
- Contain cycle facilities, including cycle hire and cycle parking

Boroughs and the GLA family*

The interchange must:

- Provide space and a time-efficient transport interchange
- Offer economic growth and regeneration (both socio-economic and physical)
- Provide access to jobs and services
- Offer greater modal choice
- Offer protection and enhancement of the built and natural environment
- Be safe
- Improve local image and character

Transport operators

The interchange must:

- Offer a fast, simple and convenient connection point between services
- Allow efficient movement of customers, with minimal obstruction
- Offer revenue generation
- Allow efficient movement of public transport vehicles
- Offer built-in recovery time and resilience to service disruption
- Ensure customer and vehicle safety and security
- Provide ticket sales
- Minimise operating costs
- Offer transport operator facilities and equipment

Commercial/retail operators and developers

The interchange must:

- Offer sufficient interior floor space/frontage for retail or other commercial activities
- Provide external space for commercial, residential or cultural/leisure development
- Offer high customer/visitor numbers
- Be commercially/financially viable
- Offer high-quality mixed-use space
- Provide servicing arrangements
- Offer a recognisable, unique and attractive location

* The Greater London Authority (GLA) family consists of: London & Partners, London TravelWatch, London Pensions Fund Authority, London Waste and Recycling Board and Museum of London.

Design themes and principles

This section provides a design and evaluation framework to achieve best practice and contains four themes, each with a number of principles.

The four interchange design themes are:

Efficiency

Inclusive design

Quality

Planning and funding

The framework should be used to evaluate the quality or design of a new interchange facility or zone at varying project stages. For example, it can be used at the start of a project to inform design decisions, during scheme development to ensure that problem areas are being appropriately addressed, or at the end to review the scheme so that lessons may be learned for future interchange projects.

When the framework is used to evaluate an existing interchange facility or zone, it should act as the basis of the interchange audit shown on the next page.

Within the audit, those principles scoring red or amber may require further consideration if the interchange facility or zone is to comply with best practice. Using this approach, the quality of an interchange facility or zone can either be evaluated at a high level, considering all users together, or evaluated from the different perspectives of customers, operators or commercial developers.

To a greater or lesser extent, all principles will be relevant to any interchange. However, the relative significance or importance of each principle will vary depending on local objectives and strategic priorities. Regeneration may be the highest priority at one location, while transport provision may be the key priority somewhere else, and a combination of these priorities will often need to be addressed.

These priorities should be agreed jointly with stakeholders at the project outset. The evaluation audit is not intended to limit flexibility and no weightings are applied (although decisions about the transport functionality of an interchange would always be expected to take precedence over matters of aesthetics). However, where there is a competition for space or the form of the design, it may be appropriate to identify those principles that best reflect the objectives of the project and weight them accordingly.

Interchange audit

Project:		Reference:		
Date:		Project stage		

Efficiency	🔴	🟡	🟢
Transport modelling and data	○	○	○
Operations	○	○	○
Safety and security	○	○	○
Movement within an interchange facility	○	○	○
Movement through the wider interchange zone	○	○	○
Sustainability	○	○	○

Inclusive design	🔴	🟡	🟢
Accessibility	○	○	○
Legibility	○	○	○
Permeability	○	○	○
Wayfinding	○	○	○

Quality	🔴	🟡	🟢
Perception	○	○	○
Built design	○	○	○
Urban realm	○	○	○
Sense of place	○	○	○

Planning and funding	🔴	🟡	🟢
Working with developers	○	○	○
Identifying commercial opportunities	○	○	○
Development proposals uses	○	○	○
The impact of development	○	○	○

Project Stage:

🟢 All criteria under that principle have been considered and addressed

🟡 Some, if not all, criteria under that principle have been considered and addressed

🔴 Few, if any, criteria under that principle have been considered and addressed

Efficiency

Interchanges help to provide a seamless experience for passengers as they move between public transport services, complete their journey by a feeder mode, or take advantage of the facilities on offer within the interchange zone.

The Efficiency theme can be sub-divided into a number of principles, as follows:

Transport modelling and data

Operations

Safety and security

Movement within an interchange facility

Movement through the wider interchange zone

Sustainability

Transport modelling and data

Investment in transport can bring about a range of economic, social and environmental benefits. Building new public transport links, providing space for cyclists, improving highways, and changing fares and tolls are all examples of investment that have the potential to make it easier for people to move around, or address the problems of public transport crowding and road congestion.

However, with limited financial resources and a variety of options, how can we tell which transport improvements are the best to invest in? We need to predict the impact of each proposal on people's travel decisions and the resulting crowding and congestion impacts against a backdrop of changes in population, employment and other economic factors. Transport models are tools that help to provide a robust and consistent evidence base for data and analysis when carrying out these predictions.

When designing interchanges, the most important question is whether the interchange offers sufficient capacity to meet demand

Sufficient capacity should be provided to meet current and expected levels of passenger activity and movement between key points within the interchange zone. Flows by direction are the most important consideration in movement spaces. In decision and opportunity spaces, the patterns of movement through the space may be more important, especially where they conflict with one another. In opportunity spaces, the capacity required for passengers waiting or queuing for tickets must also be considered and possible conflicts with movements designed out – peak periods for waiting and queuing may not be the same as those for movement.

Our models represent the behaviour of drivers, passengers, cyclists and pedestrians as they travel on London's transport network. The following gives an overview of these models, which we use to understand the long-term impacts of schemes.

Further information can be found in the guidance materials, included in the back of this document.

Transport models*

London Land-Use and Transport Interaction Model (LonLUTI)

Assesses the land-use impact of transport schemes, and provide analysis of the demographic, economic and transport outcomes of land-use proposals

London Transportation Studies (LTS)

A multi-modal strategic transport model of London and the surrounding area. Using Railplan, LoHAM and Cynemon, LTS can model how many trips there are likely to be, their origins, destinations and modes of transport. LTS has been replaced with MoTiON

Model of Travel in London (MoTiON)

Comprises LTS, complemented by existing TfL datasets such as Oyster smartcard use and the London Travel Demand Survey (LTDS). It has helped to achieve a major improvement in the quality of demand data used in strategic modelling

Railplan

A strategic public transport model for London and the south-east. It models the likely routes and service choices of public transport users, and the resulting levels of crowding on public transport networks in and around London

LoHAM (London Highway Assignment Model)

A strategic model representing routeing and congestion of motorised highway trips using London's highway network. Five sub-regional highway assignment models, representing central, east, south, west and north London, are also derived from LoHAM and can be used to assess regional schemes

Cynemon

A strategic cycling model that estimates the number of cyclists and their routes and journey times across London. Cynemon is used as a mechanism to model and visualise cyclist route choice, as well as provide the inputs for cycle connectivity mapping

* Data has been key to the way the world has responded to the coronavirus pandemic, with real-time information helping us to respond and plan our recovery strategies. Sharing and using the lessons we and others have learnt has enabled us to forecast future scenarios to enable us to rethink, adapt and recover.

Transport modelling datasets

London Travel Demand Survey (LTDS)

Each year, 8,000 randomly selected households in London and the surrounding area are interviewed about their travel habits as part of the LTDS

Origin Destination Interchange (ODX) Matrix

ODX uses Oyster card data gathered from customers touching in with their Oyster or contactless card when they board a bus. It also infers a proportion of alighting trips based on other Oyster transactions, as not all modes require tapping out at the end of a journey

Bus route Occupancy Data Survey (BODS)

Involves questionnaires being handed out to passengers as they board buses. It provides detailed information about passenger travel patterns, including the number of people boarding and alighting at each stop; the purpose of travel; the boarding and alighting locations for each journey; and how passengers get to the boarding stop, and from the alighting stop to their final destination

NUMBAT

Provides statistics on usage and travel patterns on our railway services. This detailed dataset can be used to assess train service provision, demand profiles and customer experience, as well as service planning and performance measurement. NUMBAT is planned to supersede the RODS

Rolling Origin and Destination Survey (RODS)

Involves cards being handed out to passengers as they enter the Underground network. Similar to BODS, it provides detailed information, including journey purpose, demographics, ticket type, interchange journey and car ownership. A RODS also includes count data taken from ticket gates to understand passenger numbers, travel times, walk times, customer flow, and movement within the station. However, there are a few stations where reliable count data cannot be produced, such as those we share with another train operator, or where there are no gates

London Population Synthesis (LoPopS)

Uses travel plans from the LTDS, and provides an activity-based representation of travel demand for members of London households. By creating a sequence of chained trips to various locations, such as from home to shopping; LoPopS also adds individual attributes, such as car ownership and income, which are then used to influence behaviour in the model and provide detailed output. The population is created by making it representative by area as accurately as possible

Operations

The effective planning, management and delivery of interchange operations is essential for an interchange to deliver a good user experience and be cost-effective.

Operations include consideration of service coordination, operating costs, integrated ticketing, unimpeded passenger movement, maintenance, safety and servicing.

Key elements to consider
- Balanced and integrated functions
- Coordinated public transport services
- Coordinated ticketing arrangements

Balanced and integrated functions

Most interchange zones incorporate a wide range of functions, including: different public transport services arriving and departing from various locations; waypoints for onward travel by feeder modes (such as taxi ranks or station exits); ticketing facilities; waiting areas and retail opportunities. The movement of passengers, public transport vehicles and non-users through the interchange zone can be complex, so it is important to plan the interactions between these movements to maximise efficiency and minimise conflicts.

The needs of each function and movement within the interchange zone should be properly understood and mapped at the planning and design stages. Fundamentally, this will include quantifying the patterns of movement between each function, how these change across the course of a day or week and how they may change in the future, and the characteristics of the people making these. Consideration should also be given to the needs of those operating transport and other services, such as the provision of staff facilities.

A clear understanding of these needs can add great value in decisions and trade-offs relating to the location of each function, the nature and capacity of the movement spaces between them, and the location of opportunity spaces. Every interchange zone is unique, and the trade-offs and decisions will be different for each zone.

Coordinated public transport services

Best practice inter-modal journeys rely on excellent interchange and coordinated public transport services. In most cases, passengers want to spend as little time in the interchange zone as possible, which requires very high frequency service levels, and coordinated timetabling and operation across services and modes.

Coordinated ticketing arrangements

While the purchasing of tickets at stations has reduced, we still need to consider users who rely on ticketing facilities, such as tourists. To enable this, London's fares and ticketing system is becoming increasingly integrated, but there is still room to improve coordination between operators. Ideally, the administrative boundaries between operators should not be visible to passengers, although this may require discussions beyond the scope of the interchange facility or zone in question.

Safety and security

All those using an interchange zone, including customers, staff and non-passengers, should be able to do so without fear of injury or accident. Most hazards can be avoided by design when interchange zones are planned or upgraded; under no circumstances should design compromise safety of passengers or staff.

TfL and local authorities are legally required to take all reasonably practicable steps to prevent crime and disorder*, and must consider the impact of all their decisions in relation to crime.

In addition, transport facilities and crowded places are currently identified as being under high threat from extremism. It is therefore vital that the appropriate professional advice is incorporated into schemes.

When considering opportunities for crime and disorder in interchange schemes, it is crucial to involve crime prevention specialists as early as possible in the scheme's design. This will ensure factors such as lighting, clear lines of sight and CCTV are included in the context of existing crime factors in the vicinity.

* Section 17 of the Crime and Disorder Act (1998), states that: "Without prejudice to any other obligation imposed upon it, it shall be the duty of each authority…to exercise its various functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent crime and disorder in this area." The Police and Justice Act 2006 added specific references to antisocial behaviour, drug and substance misuse to the definition.

By involving crime prevention professionals, interchange designers will be able to include a predictive element to schemes which, through specialist crime and disorder knowledge, will future-proof projects and prolong a scheme's benefits. Involving these specialists early on in the process increases the chances of many recommendations being incorporated on a 'cost neutral' basis.

Key elements to consider
- Areas where passengers and vehicles meet must be safe
- Specialist advice on crime prevention through environmental design
- Locations where individuals may be isolated from others
- Lighting must be considered across the interchange zone
- Ensure good levels of natural surveillance
- Effective use of CCTV
- Use vandal-proof fixtures and fittings

Involving these specialists early on in the process increases the chances of many recommendations being incorporated on a 'cost neutral' basis

Areas where passengers and vehicles meet must be safe

There are locations at all interchange zones where passengers and vehicles may meet, including platform edges, bus stops and taxi ranks. Within a zone, pedestrians may also come into conflict with general traffic, on the street and at pedestrian crossings, or with bicycles.

Where contact occurs more regularly, surface treatments should be used to inform passengers of the possible presence of vehicles in that area and ensure clarity on who has priority of movement to all users of that space. Signage should only be used as a last resort where demarcation through design is considered insufficient.

The boundaries between spaces for different uses should be clearly indicated and understandable using visual clues and information, tactile materials and audio signalling. Pedestrian and cycle routes must follow natural desire lines in order

to minimise the number of passengers choosing a quicker, more informal, route over a safer one.

Specialist advice on crime prevention through environmental design

Interchanges are generally considered to be crowded spaces due to both pedestrian and customer footfall, and vehicular traffic. With current terrorist threat levels, these locations may require additional security measures to protect those using the space. As with all measures, a proportionate and pragmatic approach will need to be taken when identifying threats and potential mitigations, using a clear and auditable decision-making process. In addition to this, planners must be aware of the regulatory regime for the railway environment. All interchange projects including rail must be consistent and contingent with relevant regulatory compliance measures.

As well as specialist crime prevention design advisors, architectural liaison officers and counter terrorism security advisors in local police areas, we have our own team of qualified Crime Prevention Through Environmental Design (CPTED) and protective security specialists who can offer advice. They are available by contacting the Crime Reduction & Operational Security Unit at the Compliance, Policing, Operations and Security directorate.

Crime Reduction and
Operational Security Unit
Compliance, Policing Operations
and Security
9th Floor, Palestra
197 Blackfriars Road
London SE1 8NJ

Some examples of the types of issues that CPTED may advise on are set out in the following paragraphs. Please note, this list is not exhaustive and should not be considered as such.

Locations where individuals may be isolated from others

Crime and fear of crime is greatest in those areas where an individual is isolated from others, such as bridges and subways. Personal security can be greatly enhanced by removing locations which are poorly lit or not directly visible from parts of the interchange zone in which staff are present or there are more passengers.

Lighting must be considered across the interchange zone

It is not enough to consider lighting in areas within and immediately outside interchange facilities. Planners and designers should take account of the following security measures:

- Provide even and sufficiently bright lighting to eliminate dark areas

- Install and effectively operate CCTV which is visible to passengers

- Remove any blind corners, recesses and other places people could hide. If transparent materials are used, they should be demarcated so as to be visible to those with visual impairments

- Use mirrors to lengthen sightlines

- Ensure lift lobbies, other waiting areas and locations where information is provided are located in areas which have good natural surveillance or within view of staff detail locations

Ensure good levels of natural surveillance

Instances of passengers becoming isolated from others can be reduced significantly through the use of natural surveillance. Traditionally, this has meant positioning staff and control stations in the largest proportion of the interchange zone, or ensuring that areas most prone to crime are directly visible. Duty locations can be varied across the day to reflect security concerns, and staff patrol routes and schedules can be designed to offer the greatest coverage.

At new or redeveloped interchanges, there is the opportunity to augment this traditional approach with designs which provide additional natural surveillance by passengers themselves and others working in the interchange zone. Facilities where passengers can wait or gather should be located in combined opportunity spaces where passenger activity is most likely.

Mixing uses, such as movement and decision spaces bordering active spaces or frontages, will add vitality at different times of the day or night and foster a sense of wellbeing.

Consideration should be given to retail or other areas that may not be open late in the evening or early morning, and alternative surveillance arrangements should be assessed. It may be possible to change the use of frontages in a particular area to maintain better natural surveillance when shops are closed.

Effective use of CCTV

CCTV monitoring provides numerous benefits including the recording of criminal activity and crowd management in stations. Used overtly, it can also act as a deterrent to crime and reduce fear of crime in stations, on the street and in vehicles.

However, CCTV should be seen as part of a package of security measures, along with those described elsewhere in these guidelines.

Use vandal-proof fixtures and fittings

Fixtures and fittings should use materials which deter vandalism and, where vandalism does occur, minimise maintenance or repair. This includes using graffiti resistant materials or finishes from which graffiti can easily be removed.

Evidence suggests that well-maintained, high-quality environments are less subject to crime and reduce fear of crime among passengers. For example, prompt removal of graffiti from an area reduces the likelihood of further graffiti being added in the same location.

Movement within an interchange facility

Providing for movement between public transport services, feeder modes and other interchange facilities in a balanced way is a prerequisite of any interchange zone.

Best practice examples offer routes which feel safe, are accessible to all, are unobstructed, have good surfaces, and have no directional conflicts or overcrowding.

Key elements to consider
- Easy movement between locations

- Minimise customer flow conflicts

Easy movement between locations

Natural desire lines should be identified and supported whenever possible. Forcing customers into unnecessarily long or circuitous routes can lead to recommended routes being ignored in favour of ones which can potentially place customers in danger or cause unnecessary pedestrian conflicts.

Design and operation should focus on providing short distances between modes, reducing journey times and, where possible, minimising level changes (although it may sometimes be necessary to direct or sign to longer routes for crowd control reasons). A detailed understanding of the likely demand for movement between each mode at different times of day is essential.

Design and operation of the interchange zone should cater for all required movement and be sufficiently flexible to deal with different conditions at different times.

Minimise customer flow conflicts

The coronavirus pandemic has impacted how we socialise, how we prioritise movement and the way in which we present ourselves and prepare when entering different surroundings. Temporary social distancing and security measures, put in place to slow the spread of the virus, have increased the need to look at how we measure and tackle crowding. Interchange zones experience complex patterns of customer movements between public transport, feeder modes and destinations. Interchange zones should be designed and operated to minimise the potential for conflicts between different flows of people and to promote the wellbeing and safety of users.

Provisions should be made for those moving against the main flow of people, and every effort should be made to minimise the crossing of flows of people at decision, entrance and exit points. Where movement spaces meet, such as at decision spaces, sufficient capacity should be provided, and areas kept clear of unnecessary obstructions. In decision spaces, information must be provided in locations where customers using the information do not obstruct the movement of others.

Conflicts can also occur when customer flows are obstructed by customers standing or sitting in a movement space. Stationary customers, such as those queuing for tickets or waiting for friends, should be encouraged to stay out of movement spaces by clearly demarcating the boundary with the opportunity space. Conflict can be reduced by placing information facilities away from the key movement desire lines and by ensuring that advertising does not obscure directional information.

Movement within the wider interchange zone

Connecting interchange facilities with the wider interchange zone that surrounds them requires an understanding of local patterns of movement and principal local origins and destinations. Movement to, from and through the interchange zone must be considered by all modes including, for example, vehicles using the surrounding road network. Access to the interchange facilities and movement within the interchange zone will be improved through a careful design of the local built environment that recognises the needs of all users.

> **Key elements to consider**
> - Patterns of movement should be clearly understood
>
> - Routes to and from the surrounding area must be optimised
>
> - Ensure feeder mode facilities are appropriate
>
> - Interchange zones must be well connected with external facilities
>
> - Check whether the area requires social distancing measures

Patterns of movement should be clearly understood

It is important to understand patterns of movement within the wider interchange zone and between the zone and the surrounding area in order to properly plan and design access routes. Customers' movement patterns are important, but so are those of others using the interchange zone, including local residents and through traffic.

Understanding the origins and destinations of customers and the nature of local land uses will assist in predicting how patterns of movement will change in the future.

It is also important to consider of the effects of the interchange enhancement itself; for example, improving access of the area immediately surrounding the interchange zone for all feeder modes will increase access to the public transport networks.

Planners should consider how patterns of movement, including the types of customers, vary across the day and week, and how these may change in the future.

Routes to and from the surrounding area must be optimised

Measuring the scale of movement to and from surrounding residential, employment, retail and leisure areas by feeder mode will help in planning the location of entry and exit points to and from the interchange zone, as well as the location and size of facilities such as cycle parking and taxi ranks, cycle hire and bike sharing opportunities. It will also inform decisions about the enhancement and creation of new pedestrian and cycle routes, and the approach to minimising conflict between access modes.

Where trade-offs between provision for different access modes are required, the number of people using each mode and route, and the specific requirements of each group, should be fully considered.

Ensure feeder mode facilities are appropriate

The number of cycle parking facilities provided should take account of existing and potential demand. They should be easy to use, located at high-profile points that meet with anticipated arrival points, do not impede pedestrian movement and are signposted, low-maintenance, protected from weather and secure.

Opportunities for the provision of cycle hire and bike sharing facilities should also be considered in conjunction with TfL. Third parties should get in touch in order to assess the suitability and feasibility of such facilities at specific interchanges.

Car parking should be minimised at interchange facilities, except for people with impaired mobility. Parking should not be provided where it encourages unnecessary railheading, with customers travelling further than necessary to reach a rail service, or where it can encourage customers to switch from more sustainable modes.

Taxi ranks and minicab offices should be situated in safe, accessible, well lit, and well signed locations which are convenient to customers. Taxi ranks should be clearly identified using the approved road markings and additional signage. Taxi ranks should be designed so that the system of taxi flows, including pick-up and drop-off points, is clearly understood and supports local traffic flow.

Dial-a-Ride and community transport facilities should also be provided and be located in order to minimise conflict with core public transport operations and pedestrian movement. However, they must be located conveniently for those with impaired mobility to avoid vehicle drop-off occurring in more convenient, but unofficial, locations.

Layover space, where customers must take a break between vehicles in multi-vehicle trips, for buses and coaches may, where appropriate, be provided in interchange zones. Adequate standing and layover space is necessary to support reliability.

Provision of the optimum bus network requires that layover space is at, or very close to, terminus points. Any decisions over the size and location of layover space should be agreed with TfL's Surface Transport.

Decisions about the location of taxi ranks, drop-off areas, bus stops and layover spaces should have fully conside the operation of the surrounding road network and the movement and access needs of all customers.

For further information about ranks at interchanges, email TfL's Taxi and private hire team.

Interchange zones must be well connected to external facilities

Interchange zones should be clearly signposted to and from major destinations outside the interchange zone, highlighting its location to pedestrians, cyclists and motor traffic. TfL's Interchange signs standard set out signing requirements to indicate the different modes available at any given interchange facility and National Rail has its own well-known signifier. These symbols should be on display at each entrance outside the interchange facility or zone.

If the main access route to the interchange facility is via a shopping centre, such as at Westfield Stratford City in Stratford, negotiations with the commercial owners must take place so that sign posting to the interchange facility is arranged and kept up to date. Equally, information about external facilities needs to be displayed within the interchange zone, with signing and wayfinding to specific locations. These may be negotiated with and sponsored by facilities providers.

Further guidance can be found in the
[Interchange sign standard](#).

Check whether the area requires social distancing measures

The increasing density of our cities has enabled greater connectivity and mobility so there is a long-term aspiration to consider how the urban realm will be designed to enable social distancing. The coronavirus pandemic has taught us many things, including how to further decentralise transport to other modes. Part of TfL's response to this is the Streetspace for London programme.

The Streetspace for London programme has, along with London's boroughs, created more space for people to travel safely on foot and by cycle and help authorities manage the coronavirus pandemic. The programme includes measure that will influence how we plan our local areas, with the understanding that there will be cultural and behavioural legacies from the pandemic, even once it has subsided. These include:

• Adding to the cycle network by creating new and upgraded lanes and routes using temporary lane separators such as wands

• Creating new walking, cycling and bus-only corridors in central London, reducing car use and making it easier to walk and cycle, while ensuring a reliable bus network

• Widening pavements so people can safely walk or roll wheelchairs past queues outside shops or stations

• Funding and working with boroughs on changes to their roads. Boroughs are creating School Streets which restrict vehicle access to schools at drop-off and pick-up times. This promotes active

travel for getting to and from school. Low Traffic Neighbourhoods are also being introduced in some places – these restrict vehicles from using side streets to get across an area, while keeping access for residents and deliveries

• Trialling the Green Man Authority, where pedestrian crossings see a continuous green man signal unless a vehicle is approaching

• Trialling 24-hour bus lanes on red routes, helping to make bus journeys faster and more reliable

Sustainability

Sustainable interchange design brings together social, economic and environmental elements related to national, regional and local policies and targets.

Sustainable design can make places be more efficient, help mitigate against climate change, add value to an interchange enhancement business case and meet the needs of people who want to use the interchange facility or zone now and into the future.

> **Key elements to consider**
> • Future proofing an interchange zone
>
> • Design should consider the environment and be as energy efficient as possible

Future proofing an interchange zone

The planning and design of an interchange zone must be based on current patterns of use and conditions, as well as a view of how conditions may change in an agreed future design year.

In particular, the design should take account of planned and potential changes in the density and mix of land use in the local area, the volume and pattern of customer movement between destinations and the nature of the public transport services operating in the interchange zone. These changes may require modifying the capacity for customer movement or the relative priority of these movements, changes in capacity of waiting areas (including platforms and bus stop waiting areas), relocation of transport or ancillary functions and the provision of additional functions.

Design should consider the environment and be as energy efficient as possible

The design of a new interchange facility and the management of all interchange facilities should meet with national carbon emission, water and waste targets, and minimise their ongoing energy requirements. They should seek to maximise onsite energy generation, source materials locally and use alternative energy sources where possible.

There are already many examples of how this is being successfully achieved, for example:

• Use of natural light to reduce the need for artificial lighting and cut light pollution

• Excellent insulation of indoor and heated areas

• Self-stopping escalators, which use less energy

• Generation of on-site sustainable energy

• Use of natural ventilation to reduce the need for air conditioning

• Provision of recyclable waste containers

• Use of recycled or partially recycled materials or materials derived from sustainable sources

• Safeguard existing trees and green areas and provide the opportunity to plant large, landscape trees

Various methods exist to assess the environmental credentials of a building, and these can be used to influence design from an early stage and help formulate an environmental plan for sustainable interchange facility or zone management.

Inclusive Design

Public transport plays a key role in opening up opportunities by providing access to education, employment and other essential services. It helps people connect with family and friends, and enables many people to live independently.

As a service provider in one of the most diverse cities in the world, we work hard to understand our passengers' needs and respond to these through work a variety of schemes and projects, including the Mayor's Transport Strategy. Applying inclusive design ensures that transport infrastructure enables more people to make the most of life in the Capital, and that our services meet the needs of all customers.

Accessibility
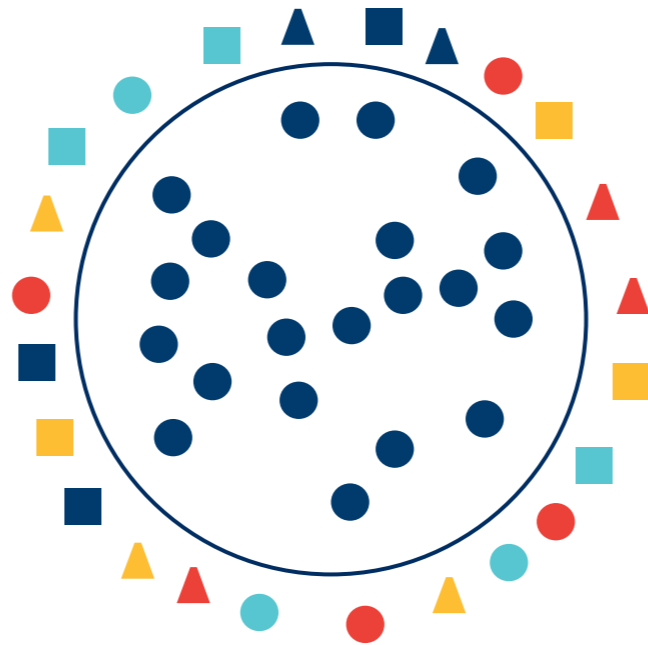
Legibility

Wayfinding

Permeability

The inclusive design process shows when the Equality Impact Assesment (EqIA) should be considered in relation to the TfL Pathway stages.

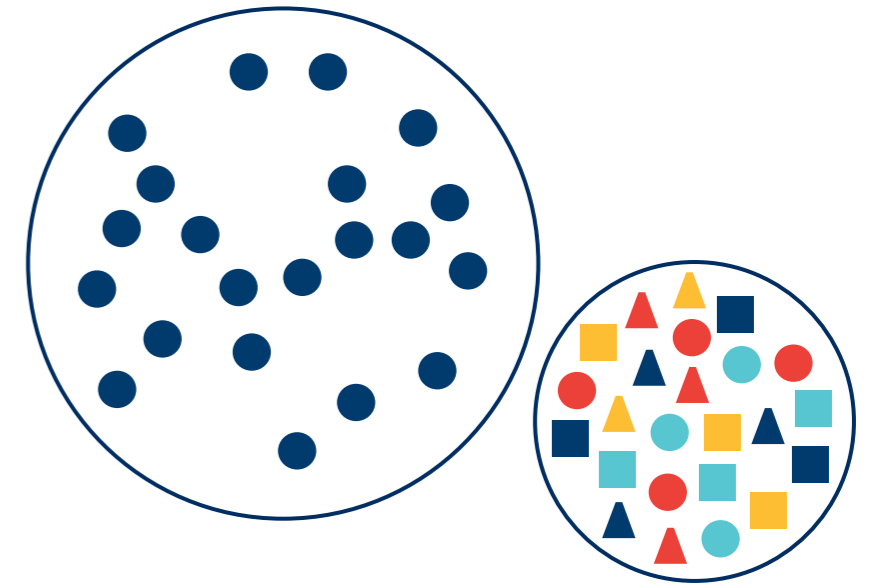**TfL Pathway and inclusive design process**

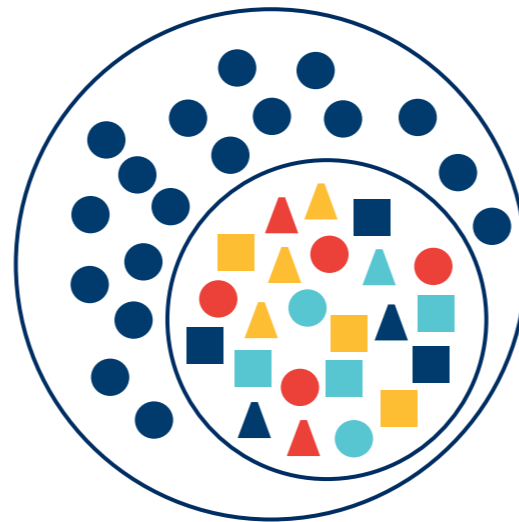| TfL Pathway	Inclusive design process
Stage 0 Initial proposition	**EqIA** • Inclusive project strategy • Inclusive design appraisal • Consultation/engagement
Stage 1 Outcome definition	
Stage 2 Outcome selection	
Stage 3 Concept design	• EqIA review and update • Inclusive design appraisal • Consultation/engagement
Stage 4 Detailed design	• EqIA review and update • Planning DAS Access Strategy for Building Control • Inclusive design appraisal • Consultation/engagement • Review changes during procurement • Review value engineered changes
Stage 5 Delivery	• Site inspection to check work and observe temporary cycle and pedestrian access
Stage 6 Project close	• Management and maintenance
Maintenance and lessons learned	• In-use evaluation

The journey from exclusion to inclusion
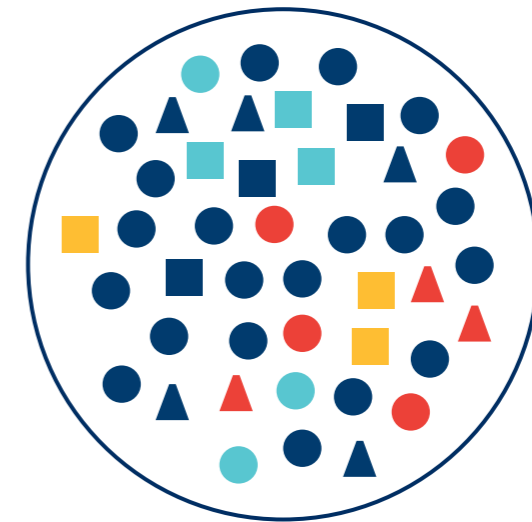

Exclusion

Segregation

Access

Inclusion

Accessibility

While this chapter looks at accessibility within an interchange, guidance on providing an inclusive environment is included under all headings as it affects all design themes and principals.

Accessibility is about making places easier to use for all passengers – including those with reduced mobility. Our physical environment can affect us all in a positive or negative way, and this is more pronounced for the many people who have a disability and those with additional access needs. This includes but is not limited to: people using wheelchairs or mobility scooters; people who are neurodivergent; older people; young children and their carers, people with heavy or bulky baggage, and those with bicycles.

While this chapter looks at accessibility within an interchange, guidance on providing an inclusive environment is included under all headings as it affects all design themes and principals

The Equality Act 2010 makes it a legal requirement to ensure disabled people are not discriminated against. Transport providers have a duty to demonstrate reasonable efforts in providing facilities to assist those with disabilities and reducing, or removing any barriers to access, both to and within interchange zones.

The requirements set out in the Equality Act 2010 should be considered a minimum standard of provision – compliance with the letter of the regulations does not necessarily mean that an appropriate degree of accessibility has been provided. Best practice exists where movement routes for all passengers are one and the same, across the interchange zone.

> **Key elements to consider**
> - Provide step-free access to all areas of the interchange
>
> - Offer level boarding to all services
>
> - Optimise all lift and escalator locations and designs

Provide step-free access to all areas of the interchange

Best practice is to ensure step- and obstacle-free access between all parts of the interchange zone, wherever possible. The easiest way to achieve this is to remove all level changes within an interchange zone. This is not normally possible at interchange facilities served by rail, where level change is often implicit, or at locations with physical constraints on space. However, interchange facilities and zones should be designed with the minimum number of levels possible and, where level change is unavoidable, lifts and escalators should be provided in addition to steps.

Where possible and practical, the best solution is a step-free route for all passengers. In some situations, such as areas with spatial restrictions, step-free routes may not be the quickest or shortest route for able-bodied passengers and a much shorter stepped route may be appropriate.

As a result, it may be appropriate to provide both stepped and step-free routes and maximise the efficiency of an interchange facility or zone. Where this is the case, the step-free route should not be isolated from the main passenger flows.

In regard to the wider interchange or public realm, the BS 8300 British Code of Practice provides guidance on designing accessible and inclusive environments for a diverse range of disabilities. When designing for an interchange, the proposal should look at the area more holistically, providing a positive experience for the entire customer journey and making the environment barrier-free for all users.

Offer level access to all services

Step-free routes should be provided between public transport services. In many cases, platforms are accessible but the trains serving them are not, or buses cannot properly access the kerbside to offer level boarding. Ideally, rail services should offer level boarding, such as on the DLR.

Where older train stock and platform heights result in stepped boarding, a form of level boarding can be created using one or more 'platform humps' spaced along the platform. Although this approach requires consistency in train stopping position and hump placement on platforms, as well as taking account of differing stock types, this is something operators should aspire to.

Optimise all lift and escalator locations and designs

Where possible, lifts should be located directly on passenger desire lines rather than in locations that would lengthen journeys or raise personal security fears. Ideally, lifts should be located so that entry and exit points have good natural surveillance.

Lift dimensions should be suitable for wheelchair users. Use of glass lifts and lift shafts enables passengers to see when the lift is coming, and have the added benefit of maximising natural surveillance of those in the lift.

Legibility

A legible environment makes navigation and movement easy and seamless, helping improve people's understanding, enjoyment and experience.

Ensuring legibility also reduces people's feelings of vulnerability caused by confusion or uncertainty in a new environment. Elements that influence legibility include sightlines to destinations, consistency of materials, finishes and furniture, use of lighting and supporting information such as signs, maps and announcements.

A interchange zone with proper legibility results in quicker and less stressful transfer between modes, easier identification of

landmarks, transport nodes, pathways and operational thresholds, minimising the need for additional infrastructure and signs to aid movement.

Key elements to consider
- Lighting can help define routes and highlight destination

- Surfaces and materials should have good visual and physical contrast

- Ensure infrastructure and street furniture is rationalised

Lighting can help define routes and highlight destinations

Lighting can increase the legibility, accessibility, security and ambience of an interchange zone. It helps to define paths between spaces without the need for additional infrastructure and highlights important features and destinations.

Lighting should be appropriate to its location and function. Illuminated routes should be evenly lit, avoiding sudden changes in lighting levels, glare, dark spots or pooling that could create confusion for visually impaired users. Use of

natural light, particularly in underground environments, can improve the ambience of the space and create a natural beacon for wayfinding as well as reduce energy consumption of in the interchange.

An agreement should be reached with owners of retail or commercial spaces within interchange zones to retain low-level, energy efficient lighting when the premises are closed, to improve the feeling of security after dark. To minimise energy consumption, the use of movement-activated lighting in low-use spaces should be considered.

Surfaces and materials should have good visual and physical contrast

All users' ability to navigate their way safely around an interchange facility or zone can be improved by the use of colour and tonal contrasts. Large open spaces without any reference points can be especially intimidating for people with visual impairments to navigate.

Avoid glare that can be caused by windows positioned at the end of corridors or passageways. Using tinted glass, anti-glare treatment or blinds can help reduce this. Information screens can also be subject to glare problems, and these must be positioned away from direct sunlight and incorporate anti-glare protection, if necessary.

Ensure infrastructure and street furniture is rationalised

Street furniture, seating, bins and other infrastructure should be rationalised and carefully placed to minimise obstruction and maximise the use of the available space. Movement spaces should be kept free of unnecessary obstructions such as temporary signs, retail stalls, newspaper vendors and so on.

Wayfinding

Clear wayfinding means improving the ease with which people can navigate to, from and within an interchange facility or zone.

Good wayfinding includes: legible, well-designed spaces; signage and information when and where customers need it; effective use of surface treatments, materials and lighting; and environmental interventions such as public art. Used properly and together, these elements create pathways, landmarks and destinations.

Wayfinding should be complementary to the layout of the interchange facility or zone, minimising the need for signage.

Key elements to consider

• Wayfinding and signage design should facilitate intuitive interchange movement and function

• Ensure naming is consistent across the interchange zone

• Use technology to support wayfinding

• Include designated step- and obstacle-free routes

Our Design standards webpage includes a range of standards and information, including for:

• DLR

• Emirates Air Line

• London Buses

• London Overground

• London River services

• London Taxi and Private Hire

• London Underground

• Santander Cycles

• Trams

• Victoria Coach Station

• Interchange signs standard

• Street map design standard

Wayfinding and signage design should facilitate intuitive interchange movement and function

We have developed a London-wide wayfinding system called Legible London which is implemented across the Capital. The system sets out principles and guidelines for wayfinding for pedestrian and transport environments, with the aim of providing an integrated and consistent information system across the city.

The system is based on the principles of mental mapping, the progressive disclosure of information, consistency of naming, product design and graphic language. It builds on an understanding that wayfinding needs to be developed as part of a wider strategy to remove physical and mental barriers to movement. Using this system enables transport environments to deliver a seamless experience from one transport mode to the next and create incentives for people to walk, reducing the pressure on other forms of public transport for shorter journeys.

Core principles of effective wayfinding include:

• Adopting principles of progressive disclosure, ensuring the selective supply of information when and where customers need it

• Breaking information into manageable chunks to help mental mapping

• Locating signs based on desire lines and pedestrian flows, with maximum visibility at key decision points and gateways

• Covering all modes and services in the interchange zone in any signs and information

• Including major local destinations in exit signs to help with orientation

• Information on signs should be concise, clear, consistent and unambiguous

• Ensuring clear sight lines to destinations to reduce the need for signs and minimising visual clutter, where possible

• Supporting the identification of routes, paths and destinations through landscape and lighting

• Identifying transport modes through consistent use of TfL and operator visual identities, such as TfL roundels

Ensure naming is consistent across the interchange zone

A high-quality wayfinding system requires consistency in the things that are named and how they are named as well as in where signs and information are located. This is even more relevant when moving from one environment to another. For example, spatial orientation from an Underground station to the street is made easier through consistency of place naming.

Consistent use of naming, from all modes through to signs on the street, can help customers feel less disorientated and make the transition easier, more efficient and more enjoyable for all users.

Use technology to support wayfinding

Technology can provide great assistance with wayfinding for all users. This includes the use of audio and visual displays in the interchange zone, as well as mobile phones, and portable sound and Bluetooth devices.

Where dynamic information is available, it should be consistent with any essential spoken information, including:

• Safety information and instructions

• Warnings, and prohibited and mandatory actions

• Service departure information

• Identification of interchange facilities and accessible routes to those facilities

Good examples include airport interchange facilities such as at Heathrow, where it is possible for passengers to receive text messages telling them which terminal to go to. Some visually impaired customers can find it difficult to read real-time information displayed on screens mounted above eye level, such as information suspended above platforms. It can be beneficial to provide additional screens at eye level and provide signage to indicate their location.

Include designated step- and obstacle-free routes

Step- and obstacle-free routes must be clearly signed to avoid those wishing to use them from having to turn back when meeting with steps or escalators.

Ideally, provide step-free routes in the most intuitive locations with long sightlines highlighting their suitability. In addition, routes should always be indicated with clear signage from key locations within the interchange zone such as platforms, bus stops or station entrances.

Information on step- and obstacle-free routes should be provided by at least one of the following:

• Braille maps

• Tactile or talking signs

• Audible directions

• Tactile paths

Permeability

A permeable interchange zone gives people maximum choice and control of movement within the zone, and makes clear connections to existing routes, facilities and destinations. Providing a permeable interchange creates a more accessible and resilient transport system.

As connectivity increases, travel distances are reduced and further route options become available, enabling more direct travel between destinations.

Good connectivity provides people with easy access to key destinations. Excellent connectivity actively seeks to discourage car in favour of making local trips easier and more pleasant by walking or cycling.

Using inclusive design to make streets more appealing helps make walking and cycling the obvious choice for shorter trips, and public transport the best option for longer journeys. It will also help to improve people's health and enable them to engage more with their neighbourhoods and the city as a whole.

A lack of permeability can further segregate existing and new communities and can have a long-term effect on the socio-economic status of an area, such as by reducing access to health, employment and education.

A lack of permeability can further segregate existing and new communities

Any major project should involve boroughs, communities, transport providers and businesses to help regenerate the most deprived parts of London, supporting good growth and opening up opportunities for the most disadvantaged groups.

Key elements to consider
- The interchange zone should connect easily with internal and external destinations

- Ensure easy movement to and from the surrounding area

- Include improvements for disadvantaged communities

- The interchange should help connect communities and encourage interaction

The interchange zone should connect easily with internal and external destinations

Interchange zones can be both a destination and an entry point to the public transport network. At a successful interchange zone, it should be easy for customers to orientate themselves, move through the space and get to their destination.

Interchange zones should be permeable, connecting seamlessly with their surrounding area. Creating a permeable space requires the removal of physical and perceived barriers to movement in, out and throughout, improving circulation and providing clear sight lines to destinations both within and immediately outside the interchange zone.

Ensure easy movement to and from the surrounding area

Intelligent and best practice design of the interchange zone, and its integration into the wider urban fabric, ensures that issues of severance and barriers from transport functions are mitigated or removed altogether.

Improving the public realm around an interchange zone can improve visibility and legibility, reduce fears for personal safety and facilitate better access.

Entrances should be located to minimise complicated routes, simplify access and reduce any perceived disadvantages of public transport use.

Included improvements for disadvantaged communities

New developments are commonly proposed in place of old uses that are no longer fit for purpose. Interchanges have the unique ability to connect and support the movement of people, thereby creating a nucleus for all types of users. If areas surrounding interchanges are designed to be exclusive it can worsen disparities in housing, wealth and opportunity thereby segregating users. Likewise, if there is no permeability between

these areas, such as railways tracks, watercourses, etc., this can create a barrier that can socially disadvantage users and the local community.

Policy documents such as the London Plan 2021, London Housing Strategy, Mayor's Transport Study and borough local plans set out strategies to improve environmental, social, health and economic issues. Interventions such as affordable housing, and the Healthy Streets Approach provide benchmarks for designers, developers and organisations to help enable positive growth.

The interchange should help connect communities and encourage interaction

By designing places that feel welcoming and secure, improvements will encourage interaction and reduce levels and fear of crime. Projects should understand the barriers faced by some of London's communities when accessing work, shops, schools, healthcare, and other places they may need or want to go to.

An Equality Impact Assessment (EqIA) is a way of systematically taking equal opportunities into consideration when making a decision on all strategies, policies, business plans, change programmes or

Projects should understand the barriers faced by some of London's communities when accessing work, shops, schools, healthcare, and other places they may need or want to go to

projects which impact on any of the nine protected characteristics, as defined in the Equality Act 2010. These are:

1. Age

2. Disability

3. Gender reassignment

4. Gender (sex)

5. Marriage and Civil partnership

6. Pregnancy and Maternity

7. Race (ethnicity)

8. Religion and Belief

9. Sexual orientation

We must also consider the needs of people who have the potential to be socially excluded, such as:

• People on low income

• Refugees and asylum seekers

• The homeless

• Job seeker

Quality

Providing a high-quality interchange facility and environment will improve all aspects of users' whole journey experience.

A high-quality interchange facility and zone will influence how it is perceived by its users, operators and providers. Good design can enable an ambience of safety, local identity and destination. This can act as a catalyst for social, economic and environmental benefits and instil a sense of civic pride in those who use it.

According to forecasts, by 2041, the public transport system will need to cater for up to 15 million trips a day, making it essential to provide Londoners with attractive alternatives to car use.

Principles in this theme are:

Perception

Built design

Urban realm

Sense of place

Perception

The perception of an interchange facility or zone is based on a combination of performance, accessibility and function, all of which form an essential part of a user's experience.

In some cases, the interchange may develop into a 'destination', where opportunities present themselves to enhance the interchange experience, lifting spirits for users and encouraging investment and socio-economic and physical regeneration in surrounding areas.

A safe, attractive, efficient and well-maintained interchange facility or zone that presents opportunities for optional social activities and is integrated with its community and surroundings will encourage people to value and use public transport.

Key elements to consider
- Interchange zone facilities must meet the needs of interchange users, operators and owners

- Interchange zone facilities should add value to the user experience

- The interchange zone should demonstrate acceptable standards of cleanliness, comfort and safety

Interchange zone facilities must meet the needs of interchange users, operators and owners

Different users will perceive functions that add value in different ways, depending on their role in the use or operation of the interchange facility or zone.

Customers will be sensitive to convenience and ease of interchanging modes, as well as safety, comfort and cleanliness of any areas they must pass through. They will notice the time it takes to interchange, the quality of the interchange itself and the facilities provided, and opportunities on offer, and think of them as activities along a journey or as destinations in their own right.

Public and private transport operators will look at the interchange from a more commercial perspective, principally in terms of generating business. They will advertise services from one mode to the next, promote their services via the facilities and other functions on offer in and outside of the interchange facility or zone. In larger interchange zones, a facility or zone operator (or station manager) will be present and will have a different perspective. Their priority is the fast and efficient management of the interchange, as well as carrying out safety procedures and successful maintenance regimes. They will have an interest in the quality and function of the interchange zone's facilities, and will maximise the potential for commercial returns through the franchise of wider functions and facilities of the interchange zone.

Understanding and meeting the needs of all the above is a fundamental challenge if we are to deliver interchange facilities and zones that meet or exceed national and local targets for quality of design, and help improve perceptions of public transport as a positive mode choice.

Do interchange zone facilities add value to the user experience?

The extent of the facilities provided will depend on the size and scale of the interchange facility or zone. However, all interchange facilities and zones should aspire to provide the following basic facilities:

- Timetables and departure boards, including taxi and bus information if not already included
- Accessible toilets and baby changing facilities
- Seating and rest areas
- Real-time travel information
- Local network maps
- Local area maps, including routes through adjoining public buildings where these form part of the interchange movement
- Exits and amenities
- Cycle parking*
- Helpline telephone or Help Point
- Clocks
- Bins and recycling facilities, where practicable and safe

Seating and waiting areas

Appropriate seating provisions provide greater comfort for all customers, and are especially important for customers with mobility impairments. Seating should be provided at frequent intervals, ideally every 50 metres, and adjacent to pedestrian flows without obstructing these.

Further guidance on seating can be found in our Streetscape guidance.

Advertising

Advertising and other sponsorship material should be carefully placed without dominating a customer's line of vision or covering up or distracting from information regarding movement. Advertising should not be located in decision spaces and careful consideration should be given when it is located adjacent to key directional information.

Retail, food and leisure

Interchange zones are not just transport spaces, they are also public spaces. Customers generally welcome the provision of non-transport facilities such as shops, places to buy food and drink, and cash machines. These enable them to make the best use of the waiting time for their next service and make the wait more enjoyable.

These facilities provide an important service for people living and working in the surrounding area and, by bringing activity into an interchange zone, can make customers feel more secure, particularly during less busy periods of the day or during the evening, by providing natural surveillance.

* Further guidance is available through our online open data London Plan cycle parking calculator

The interchange zone should demonstrate acceptable standards of cleanliness, comfort and safety

High standards of cleanliness help to create a sense of safety and security as well as minimising the risk of accidents through trip hazards or slippery surfaces.

Minimum maintenance standards must always be met and, where possible, exceeded. When an interchange zone is a shared space with retail or other functions, tide marks resulting from different maintenance regimes may be avoided through adopting combined resources.

Built design
Well-designed interchange facilities or zones create places that people enjoy and want to use.

The design quality of an interchange facility or zone must be assessed in terms of the functional effectiveness of its spaces, including surfaces, appearance, arrangements and any other elements. From an operator and provider viewpoint, these qualities will reflect the types and status of the services on offer and overall demand.

> **Key elements to consider**
> • Materials and finishes should add value to the user experience
>
> • Products and furniture must be consistent with TfL standards
>
> • Landscape elements around the zone should add value

Materials and finishes should add value to the user experience
Materials should always be fit for purpose. Quality materials are generally longer-lasting and can be more cost effective in the longer term. Materials used in construction of interchange zones should meet with carbon emission, water and waste use targets, and minimise ongoing energy requirements.

High quality can also deter anti-social behaviour and vandalism. Wherever possible owners and operators of interchange facilities or zones should seek to ensure that architectural finishes are consistent throughout the interchange zone so that customers do not experience 'tidemarks' as they pass between areas controlled by different operators.

Materials should be appropriate to the local context and enhance the character and quality of the interchange facility or zone and its functions. Where performance is not hampered, the designer should seek to utilise wholly or partially recycled materials or materials derived from sustainable sources.

The use of tactile paths, good contrast and non-reflective surfaces is essential for visually impaired users to navigate an interchange facility or zone.

Bold, attractive colours should be chosen, and lighting should be appropriate to location and function – not using too much, but focusing on what's important. Illuminated routes should be evenly lit, avoiding sudden changes in levels, glare, dark spots or pooling that could create visual confusion for visually impaired users.

Products and furniture must be consistent with TfL standards
We have established standards for the design of products and furniture for public transport facilities to ensure consistency across operating environments and to minimise future life costs for maintenance and replacement. These standards should be referred to as a benchmark for all products used within an interchange zone.

Landscape elements around the zone should add value
Good soft and hard landscape elements are key to making the interchange zone more attractive and encourage a sense of ownership by its users. It is important that such landscape elements are designed in such a manner to discourage antisocial behaviour, for instance by becoming cover for possible criminal activity or becoming a target for vandalism. The Department for Transport's Secure Station Scheme also supports this, and points out how landscape elements can make a station feel safer, helping to reduce crime.

It is also essential that soft and hard landscape elements are designed in such a way that they can be easily and cost effectively maintained on a regular basis. Examples include shrubs and slow-growing trees; prickly vegetation is ideal as it reduces opportunities for concealment.

Landscape checks should be part of the interchange's regular maintenance procedures.

Local boroughs' open space strategies need to be taken into consideration when planning individual interchanges.

⬈ Further information is available in our online Streets toolkit and DfT Secure Station Scheme

Urban realm

An interchange zone will typically include spaces that are both integral to and related to the interchange facility, but not necessarily a part of the interchange. These spaces are as much a part of the overall interchange zone design as its built elements, and their quality must be evaluated in a similar manner. To understand the principals of designing the station's public realm, please read the Station Public Realm Design Guidance.

Key elements to consider
- Spaces provided should be the appropriate size for estimated current and future uses

- The spatial design should feel open, connected and safe

- Ensure the design of the interchange zone is integrated with the urban context

- The interchange should support the night-time economy

Spaces provided should be the appropriate size for estimated current and future uses

Large or empty interchange zone spaces can make customers feel disproportionately unsafe, especially late at night or early in the morning. The spatial proportion is important to ensure that customers feel comfortable and secure, not ill at ease or threatened, as well as cope with maximum capacity.

Narrow spaces with high-ceiling or wide spaces with low-ceilings may have the appropriate capacity for their usage but feel cramped or threatening. Equally, a wide-open, undefined space may be disorientating.

Does the spatial design feel open, connected and safe?

Most spaces within interchange zones will be defined by the nature and degree to which they are enclosed. The interchange zone must feel open while not being desolate or empty.

Clear sightlines are important to promote a feeling of security. Opportunity spaces where retail and catering facilities are provided are ideal as their frontages will generate activity and provide enclosure. Be aware that there are occasions where enclosure is necessary and appropriate, such as in waiting areas along platforms exposed to the wind, rain and cold.

Where a scheme involves upgrading infrastructure, the project team should look at opportunities to provide wider improvements to the urban realm and active travel. This can result in a more seamless and cost-effective improvement eg widening footways and formal crossing points.

Do activities within the interchange add value and convenience?

Attractive frontages of commercial space lining the corridors and zones of the interchange zone can be an asset; active frontages can provide life to the interchange zone, and links between internal and open spaces.

Care must be taken to ensure that the main use of the location as an interchange facility is not reduced by untidy or excessive amounts of retail frontage.

The interchange should support the night-time economy

Some interchanges contain significant landmarks that are celebrated during the evening. Less formal environments that include markets, park events, small festivals and pop-up shops can also benefit from extending their operation hours. To support travel during these times, some London Underground and London Overground lines run a 24-hour service from Friday to Sunday. If there is an opportunity to provide these services, the interchanges should consider:

- Broader ideas led by the local authority

- Differing profiles and characteristics from day to night

- Night-time lighting

- Safety

- Spaces that cater to all age groups and provide all levels of access

- Public performances that celebrate local character

- Family-friendly activities in public places

Sense of place

Best practice design provides the opportunity to create places, streets and spaces that meet the needs of customers, are visually attractive, safe, accessible, functional and inclusive. These spaces can have their own distinct identity and maintain and improve local character.

Place-making architecture should be encouraged when upgrading or designing a new interchange, using the opportunity for a better public building and helping to support a sense of local pride and civic architecture.

But this does not mean that designs have always to be different – a recognisable place may be one where all elements are in harmony as a whole. Best practice in integrating design and construction can deliver better value for money as well as better buildings.

Good design is functional, efficient and attractive for users and the wider public, and respects and enhances the local surroundings. It should look at how it can improve peoples' lives, helping to revitalise the fabric of an urban area and deliver social, economic and environmental value.

Key elements to consider
- The surrounding area's function and identity

- Commercial facilities within the interchange zone

- The design should create value for the local area

- Any landmark buildings, heritage assets or features

The surrounding area's function and identity

Place-making interchange facilities or zones often border major destinations that may add a sense of identity.

The starting characteristics of an interchange zone reflect its location within a city, urban, suburban or rural area. Whether it is a recognisable centre of activity or district to that location should be considered next. For example, stations such as Charing Cross are well-known as a central London location while also being recognised as a travel hub. Defining the type of centre should come before determining its characteristic functions.

Another key factor of the interchange zone's identity is the main function of the area itself. The function of some interchanges may be relatively non-descript and residential. However, London has some interchange zones with a considerable

individual identity, such as Canary Wharf for business, the Barbican for art and culture, Oxford Street or Brent Cross for shopping, North Greenwich for leisure, Wembley for the national stadium, etc. In some cases, the interchange zone may have an overwhelming 'transport' identity, such as Heathrow for the airport or St Pancras for the Eurostar.

Commercial facilities within the interchange zone

Some larger interchange zones are able to incorporate a wider range of facilities. Customers will appreciate commercial outlets, from a basic hot drinks counter and newsagent, to shops to buy gifts and souvenirs. When the range, number and quality of the goods sold increases, the interchange itself may become known for good shopping, for example at St Pancras, Victoria, Hammersmith and Wood Lane.

However, the desire to provide commercial activity should not outweigh the role and function of the interchange movements. The level of commercial activity should be appropriate to the scale and function of the interchange.

The design should create value for the local area?

The added value of a well-designed place can manifest itself in many ways for different stakeholders. It is important that stakeholders recognise what these are. Some social and environmental benefits are less tangible and can be easily overlooked. These may include:

- A sense of well-being for locals, resulting in a positive environment to live and work

- Encouraging users to linger and enjoy local facilities such as cafés and retail outlets

- Reduced congestion resulting in improved environmental conditions

There is also an opportunity for sustainable regeneration through active support of local start-up business, social enterprise and complementary transport activity in redundant buildings and on adjacent waste land.

Any landmark buildings, heritage assets or features

Landmark buildings can add value and increase the sense of place by promoting the culture or image of an area. These can be an important factor in encouraging businesses to locate there, and can boost tourism and visitors contributing to the local economy.

The introduction of public art and natural features, such as tree planting, can make interchange zones more attractive public spaces and make waiting or transferring between modes more enjoyable.

Care should be taken however to ensure that these features do not obstruct pedestrian routes or act as screens for anti-social activities.

Planning and funding

The last chapter of this guidance highlights the importance of planning and funding for building or reconfiguring interchange hubs.

Interchanges have traditionally been funded by public sector budget but, to provide enough benefits, we are increasingly inclined to use different sources of funding for transport improvements, including attracting investors and the private sector.
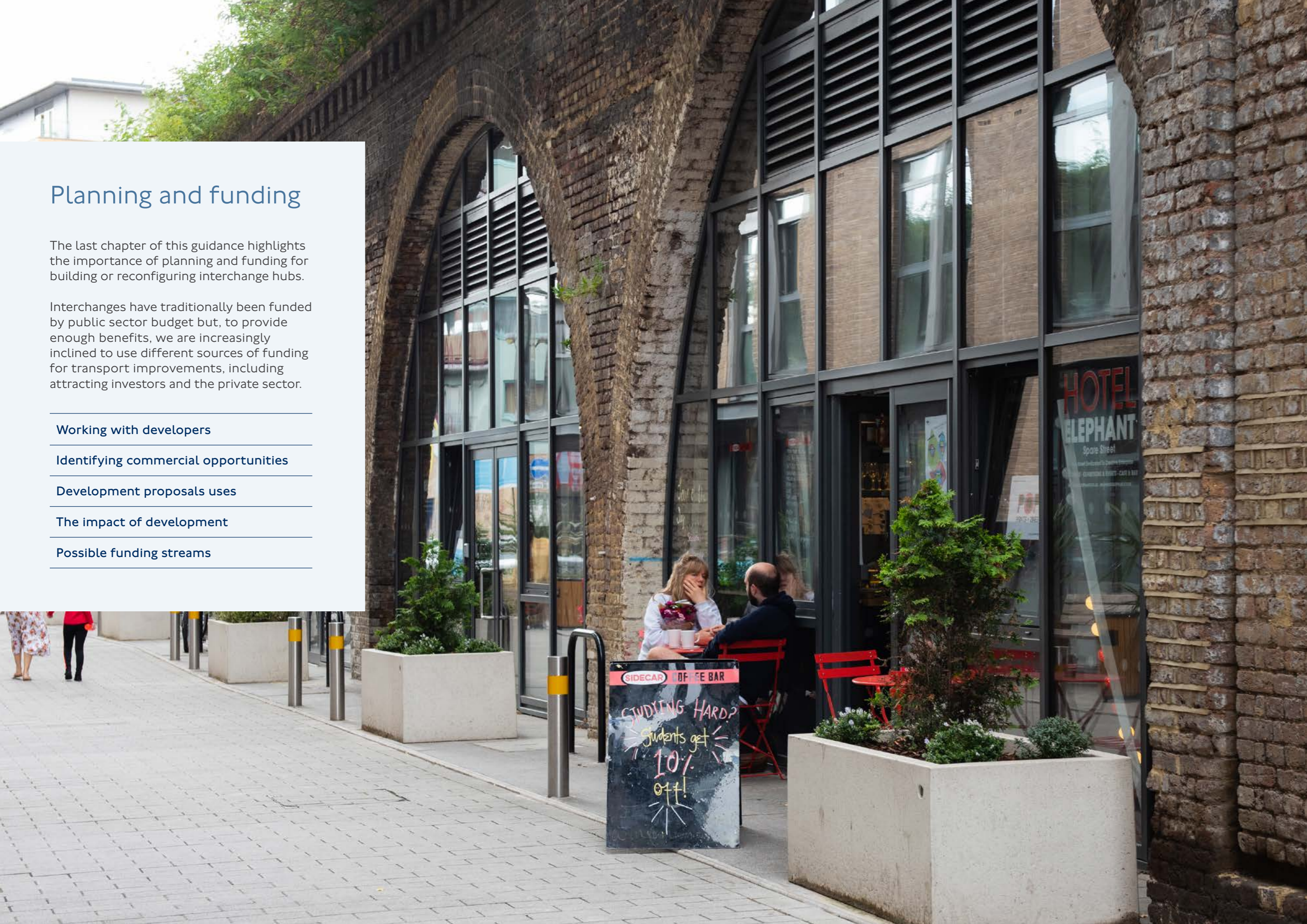
Working with developers

Identifying commercial opportunities

Development proposals uses

The impact of development

Possible funding streams

Within planning, we are the highway authority for the Transport for London Road Network, known as red routes. In addition to our role as transport operators, we are also a property and landowner.

Some planning applications in London are automatically submitted to us by the Greater London Authority or individual London boroughs. We can show how these planning applications are likely to affect transport before they are determined by the Mayor.

The Town Country Planning (Mayor of London) Order 2008 defines three categories of new development which, because of their strategic importance to London, must be referred to the Mayor:

- Category 1: large-scale development

- Category 2: major infrastructure

- Category 3: developments that may affect strategic policies

Key elements to consider
- Working with developers

- Identifying commercial opportunities

- Development proposals uses

- The impact of development

- Possible funding streams

Working with developers

Many major interchange zone enhancements in London are at least part-funded through developer contributions, secured via Section 106 obligations on developers to mitigate the impact of their development on public infrastructure.

Commercial, retail or other development in, above or adjacent to interchange hubs are particularly attractive to developers due to its proximity to public transport (reflected in potential rental values) and high footfall. This investment is clearly welcome but also needs to take the developer's preferences into account, in terms of the design of the interchange zone, most notably the location of commercial and retail floor space.

Where possible, TfL also seeks to use its land assets to maximise revenue potential from alternative sources, such as developments above interchanges, assuming sufficient quality of design.

We continuously work with developers and other stakeholders for interchange enhancements to be optimised for all parties, including customers and operators. The design framework underpinning these guidelines will assist both transport planners and developers in reaching outline interchange designs which satisfy the key requirements of all parties.

The spatial management principles, as outlined in the Interchange spatial management section, offers a simple

approach to define which functions must have priority in different spaces. By using this approach, planners can set out what functionalities should be prioritised within a mixed-use interchange facility or zone at an early stage, thereby giving developers a clear indication of the parameters within which they can operate.

Involving a developer in an interchange enhancement project should be seen as an opportunity to secure much-needed investment to overcome legacy issues that undermine the quality of the interchange experience. Developers can bring resources and commitment which will add significant value to a project and improve the quality of an interchange.

Identifying commercial opportunities

By their nature, transport modes often require a significant land footprint to deliver customer access and often provide large proportions of the facilities themselves. The customer must take priority over the space used in the interchange facility and wider interchange zone, ensuring movement is fully catered for and crowding does not occur. However, any excess space should be considered for a commercial opportunity.

Depending on the amount of land, there may be scope to provide ambitious property development, potentially providing significant non-fare revenue streams. These opportunities can take the form of medium- to large-scale housing, office or retail developments,

often providing a number of units across multi-storey structures above the main interchange facility.

Advertising is a well-known source of alternative income, particularly on the London Underground. When used, adverts should always be placed so they are visible to the customer while not obscuring any movements, either directly by being positioned in the way of a desire line, or indirectly by covering important wayfinding and signage. Typical best practice locations for adverts are on station walls opposite platforms, on station walls alongside platforms away from any signage or alongside escalators.

For larger free spaces within the interchange facility or wider interchange zone, retail units can be provided, assuming sufficient servicing and potential queueing space so as not to obstruct customer movement. Typical spaces include kiosks within an interchange zone, large ticket halls where crowding is not present or within converted station facilities such as disused staff rooms or closed ticket offices. These units can deliver steady income streams to the transport company.

Facilities at interchanges can provide added value to customers and to non-travelling users. Equally, they bring opportunities for transport operators and facilities providers to attract custom and revenue. The range and scale of facilities will depend on the functional needs of

individual interchange facilities and zones. These are likely to be larger at major interchanges, so assessment requires the listing of provision as well as opportunities for what could be provided.

Development proposals should represent the floor space demand in the local area

To maximise the revenue generated from any large-scale property developments on the land occupied by an interchange facility, an understanding of the local floor space market must be established. This can be done through an analysis of floor space use over a recent time period or discussions with the local borough over ambitions for the site. By providing residential, office or retail floor space in high-demand areas, the revenue generated can often be negotiated to a higher sum.

The impact of development opportunities on users of the wider interchange zone

Large-scale developments should only be pursued if they do not negatively impact customers using the interchange facility. This can be achieved through efficient design, ensuring no obstructions to movement spaces are caused. Where a large amount of additional demand may be generated from a development opportunity, which may cause crowding on an existing bus service, provisions should be made to ensure that little or no negative impact is incurred by customers using these transport services.

Possible funding streams

Housing Infrastructure Fund

The Housing Infrastructure Fund is a government capital grant programme of up to £2.3bn, which will help to deliver up to 100,000 new homes in England. Funding will be awarded to local authorities, providing grant funding for new infrastructure that will unlock new homes in areas with the greatest housing demand.

How does it work?

The Housing Infrastructure Fund specifies two funding mechanisms:

- Marginal Viability Funding: to support infrastructure projects that need a funding gap to be filled in order to go ahead

- Forward Funding: provides the first amount of funding to back a small number of strategic and high-impact infrastructure schemes

How much is available?

- Bids can be up to £10 million for Marginal Viability proposals

- Bids can be up to £250 million for Forward Funding proposals

Eligibility

Applications are assessed on how well they meet the following criteria: strategic approach, value for money and deliverability.

Who can bid

Local authorities

Section 106

Section 106 of the Town & Country Planning Act 1990 is a legal agreement between an applicant seeking planning permission and the local planning authority, used to mitigate the impact of the development on the local community and infrastructure. For example, a residential development will increase the number of private and public transport users and residents' children may attend nearby schools, putting a little more strain on local services.

How does it work?

The section 106 agreement is decided through the consultation period of the planning application, with the relevant parties and local authority planning officer.

How much is available?

Contributions can vary depending on the nature of the development and the needs of the district. Contributions can be shared to support various obligations, including public open space, affordable housing, education, highways, public transport, town centre improvements and healthcare

Eligibility

The project must prove that the development affects the functionality of the facility

Who can bid

Local authorities and owners of public infrastructure eg TfL, Network Rail and the NHS

Community Infrastructure Levy

Similar to Section 106, Community Infrastructure Levy contributions pay for new, or the refurbishment of existing, infrastructure to support the additional burden new development can have on both local and strategic infrastructure. Whereas Section 106 agreements are focused on addressing the specific developments, the Community Infrastructure Levy can be applied to a proposal in the levy's charging zone.

There should be no circumstances where a developer is paying Community Infrastructure Levy and Section 106 for the same infrastructure, in relation to the same development.

Possible funding streams continued

TfL's Growth Fund

TfL's Growth Fund is designed to help finance transport infrastructure schemes that can unlock housing and regeneration opportunities in London.

How does it work?

The project should have passed the TfL Pathway Feasibility stage and requires over 50% third party funding. The funds are administered by the TfL Growth and Masterplanning team.

How much is available?

Up to £30m, but typically no more than £15m.

Eligibility

A project has to clearly show how it will enable housing, employment, be deliverable and align with wider Mayor's Transport Strategy objectives.

Who can bid

Internal TfL groups only

Mayor's Land Fund

The Mayor's Land Fund enables the Greater London Authority to work with private developers, registered providers, local authorities, and other public-sector bodies to find ways of unlocking and increasing the delivery of affordable housing in the Capital. The fund comprises at least £736m, drawn from the GLA's housing and land resources alongside funds the Mayor has secured from the Government.

Part of the Fund has been allocated for recoverable investments, including buying and preparing land for onward sale and development. This enables the GLA to reinvest receipts to unlock more opportunities in London.

How does it work?

- An expression of interest form is available on the GLA website

- Funds will be administered through a multi-staged assessment, decision-making and monitoring process

How much is available?

Up to £50m, although exceptions are possible.

Eligibility

Applicants are asked to demonstrate how their proposals unlock housing delivery.

Who can bid

Local authorities, developers and landowners.

Levelling Up Fund

The Levelling Up Fund is a £4.8bn fund that supports capital investment in local infrastructure up to 2024–25. It brings together the Department for Transport, the Ministry for Housing, Communities and Local Government, and the Treasury to invest in high-value local infrastructure that improves everyday life. The fund prioritises places in need of economic recovery and growth, regeneration, or improved transport connectivity. All areas in the UK are able to submit bids enabling all communities to strengthen their economy.

How does it work?

- An expression of interest form is available on the GLA website

- Funds will be administered through a multi-staged assessment, decision-making, and monitoring process

How much is available?

Up to £4.8bn.

Eligibility

- The project should demonstrate how local infrastructure will have a visible impact on people and their communities. Each bid can be for an individual project, or a package bid of up to three projects. Local authorities may submit joint bids.

- Key themes: local transport schemes, urban regeneration projects and cultural assets.

Who can bid

Local authorities are able to submit bids of up to £20m.

GLA and TfL are eligible to submit one transport bid of £20m, or up to £50m by exception.

Case studies

When working on an interchange project, a key objective is to support the growth of an area by ensuring that there are enough transport connections to support existing and new communities. The need for improvements is set out within various planning documents such as The London Plan, Mayor's Transport Strategy and borough local plans. Combined with priorities and aspirations from various stakeholders, such as developers and transport operators, this can create a brief that will provide well-connected spaces that suit users' needs.

It is important to note that many interchange projects are delivered over a considerable amount of time, sometimes decades. As a result, designs and strategic values can change along way, such as providing multi-storey carparks or cycle lanes. This means that when projects have been completed, we look back to understand what worked well and what we could have done better. This is called lessons learnt.

This section of the guidelines demonstrates the complexity of developing these spaces and provides information on the following case studies:

King's Cross and St. Pancras International

Stratford, London

Canada Water

Victoria

East Croydon

Leytonstone

Canary Wharf

Rotterdam Centraal, The Netherlands

King's Cross and St Pancras International

King's Cross was identified as an opportunity area in the first London Plan in 2004. The policies set out in the plan identified the completion of High Speed I, linking King's Cross to the Channel Tunnel, as a catalyst for regeneration. The collaboration between multiple stakeholders resulted in a masterplan that is both economically attractive to investors and a vibrant visitor destination. The area now offers high-density business development with a public realm that supports education, commerce and placemaking.

The area has had a history of expansion, more noticeably since the industrial revolution in the I8th century. As part of the masterplan, new architectural elements have been sensitively linked with the various heritage sites in the area.

King's Cross and St Pancras International stations

Location	Central London
Station owners	High Speed I Ltd, Network Rail and TfL
Station interchanges	London Underground (Circle, Hammersmith & City, Metropolitan, Northern, Piccadilly and Victoria lines), St Pancras International station (Eurostar) and National Rail (Great Northern, Southeastern high speed, Thameslink and East Midlands Trains)
Wider interchange	Buses, cycling, taxi ranks, coaches and designated walking routes
Landmarks and heritage assets	• Granary Square and Coal Drops Yard • Harry Potter Hogwarts Express: Platform 9 3/4 • King's Cross station (Grade I listed) • St Pancras station (Grade I listed) • Camden Town Hall (Grade I listed)
Authorities	• London Borough of Camden • London Borough of Islington • TfL (highway and red routes)
Station improvements	National Rail: • King's Cross station: Grade I listed station redeveloped • Retail units within the station • 7,500sqm new western concourse • 4,000sqm of refurbished office space • 2,500sqm of photovoltaic panels to generate I0 per cent of the station's power needs • Improved interchange with St Pancras International station and London Underground station London Underground: • King's Cross St Pancras station upgrade • Step-free access
Lessons learnt	• Positioning of bus routes across the interchange have reduced its accessibility • Route between King's Cross and St Pancras International prioritises private vehicles and taxis but hinders pedestrians and buses • Signage for strategic cycle network and onward connections needs improving
Completion date	2012

King's Cross and St Pancras International stations

Master plan	
Site size	270,000sqm
Commercial estate	• 50 new and restored buildings • 3I6,000sqm of workspace • Coal Drops Yard: 9,290sqm shopping complex • Granary Square: University of the Arts and Central Saint Martins • New primary school
Homes	2,000 new homes, including 325 affordable
Jobs	I0,000+ new jobs
Transport improvements	• New taxi ranks • New bus routes
Public realm	• Accessible public realm • I05,000sqm of open space • 20 new streets • I0 new public parks and squares
Completion Date	2020

Stratford, London

Stratford station is a key interchange in east London, providing connections to the Central and Jubilee lines, two branches of the DLR, Crossrail and National Rail services, as well as local buses, taxis and cycling infrastructure. Upgraded as part of the 1999 Jubilee line extension, the station acts as the gateway to the Queen Elizabeth Olympic Park and Westfield Stratford City shopping centre.

Stratford received significant attention in the run up to the London 2012 Summer Olympics, with the overarching objective of creating a new transport hub that would help facilitate local regeneration. To support this, the station development included a new civic square, bus station, cycle parking, improved taxi facilities and coach drop-off and pick-up point.

Stratford station

Location	East London
Station owners	Network Rail and TfL
Station interchanges	London Underground (Central and Jubilee lines), DLR, TfL Rail, London Overground, Greater Anglia and c2c rail
Wider interchange	Buses, cycling, taxi ranks and coaches
Landmarks and heritage assets	Westfield Stratford City shopping centre, Queen Elizabeth Olympic Park, London Aquatics Centre, London Stadium (West Ham United Football Club) and ArcelorMittal Orbit
Authorities	• London Borough of Newham (local, planning and highway) • London Borough of Hackney (local, planning and highway) • London Borough of Tower Hamlets (local, planning and highway) • London Legacy Development Corporation (planning) • TfL (highway and red routes)
Station improvements	• New station entrance adjoining Westfield Stratford City shopping centre • Retail units within the station
Lessons learnt	• Complex and fragmented land ownership within station • Unintuitive station layout • Stratford International station bus stops not highly used • Signposting for cycle parking needs improving • Signage for strategic cycle network and onward connections needs improving
Completion date	1999

Stratford station

Master plan – Stratford City and London 2012 Summer Olympics and legacy

Site size	• Stratford City: 730,000sqm • London 2012 Summer Olympics and legacy: 2,260,000sqm
Commercial estate	• Stratford City: • Westfield Stratford City shopping centre (176,500sqm): 250 retail units • International Quarter London business development area, 89,000sqm • 2012 Summer Olympics and legacy: • Queen Elizabeth Olympic Park (2,260,000sqm): London stadium, London Aquatics Centre, ArcelorMittal Orbit, Copper Box Arena, Lee Valley VeloPark and Lee Valley Hockey and Tennis Centre
Homes	• Stratford City: 6,000 homes • 2012 Summer Olympics legacy: 6,000 homes
Jobs	• Stratford City: 31,000 jobs • 2012 Summer Olympics legacy: 3,500 jobs
Transport improvements	• New Stratford International DLR station • New Stratford City bus station • New Stratford Town Centre Link bridge • New Stratford station Westfield entrance • New Stratford station Westfield entrance taxi rank
Public realm	• New urban realm • Pedestrian bridge • Sustainable environment: green space, natural habitats, Combined Cooling and Heating Plant (CCHP) • New walking and cycling routes
Completion Date	• Stratford City: 2011 • 2012 Summer Olympics and legacy: 2012

Canada Water

Canada Water station was built as part of the Jubilee line extension in 1999, servicing the Jubilee Line, London Overground and integrated bus station. Canada Water was identified as an opportunity area in the 2016 London Plan, with the opportunity to deliver 3,300 homes and 2,000 jobs.

Growth in the area has meant that the station is proposed to undergo capacity improvements to support current and future users. Serving inner London communities, local boroughs and authorities support masterplan proposals by ensuring a focus on supporting local investment, local facilities and affordable housing.

Canada Water station

Location	East London
Station owners	TfL
Station interchanges	London Underground (Jubilee line) and London Overground
Wider interchange	Buses and cycling
Landmarks and heritage assets	• Canada Water Library • Surrey Quays Shopping and Leisure Centre
Authorities	• London Borough of Southwark • TfL (highway and red routes)
Station improvements	• Jubilee line extension • New station with step-free access • New bus station
Lessons learnt	Predicted increases in demand will further impact on key interchange routes between London Overground and the Jubilee line. The current design does not allow for this.
Completion date	1999

Canada Water station

Master plan (proposed)	
Site size	214,480sqm
Commercial estate	Phase one: • About 100,000sqm of retail, leisure, entertainment and community space. • About 320,000sqm of workspace • Expanding existing school and new TEDI-London campus • New leisure centre • New high street and town square
Homes	3,000 new homes (35 per cent affordable)
Jobs	20,000 new jobs
Transport improvements	• New taxi ranks • New bus routes
Public realm	• About 48,000sqm of open space, including 14,000sqm park • Canada Water community program • Training and employment program • Ecological enhancements to Canada Water Dock
Completion Date	Phase one: 15 years (2024)

Victoria

Victoria has recently undergone a station upgrade to provide more capacity and step-free access. Alongside this, Nova, a nearby mixed-use office and retail development, was also completed, providing a glimpse of the economic and placemaking potential of Victoria. Located in central London, the area is an established business and tourist destination with various landmarks such as Buckingham Palace and Westminster Cathedral. As an opportunity area, Victoria has the development capacity to support 1,000 homes and 4,000 jobs.

Victoria station

Location	Central London
Station owners	Network Rail and TfL
Station interchanges	London Underground (Circle, District and Victoria lines), National Rail (Gatwick Express, Southern and Southeastern)
Wider interchange	Buses, Coaches and Taxi ranks
Landmarks and heritage assets	• Victoria station (Grade II listed) • Victoria Station Arcade (Grade II listed) • Grosvenor Hotel (Grade II listed) • Palace Theatre (Grade II listed) • Apollo Theatre (Grade II listed)
Authorities	• City of Westminster • TfL (highway and red routes)
Station improvements	• Station upgrade • Step-free access • New Northern ticket hall • Enlarged exiting ticket hall • New entrance at Cardinal Place • New entrance on Wilton Road • New square outside the National Rail entrance • 29,000sqm of retail space above the station (over site development)
Lessons learnt	• New subway link across ring road is a benefit to road safety • Route to platforms are long, however this was engineering constraint
Completion date	2019

Victoria station

Master plan (proposed)

Site size	37 acres
Commercial estate	• About 250,000sqm of office space • About 40,000sqm of retail space • About 5,000sqm of community facilities • About 5,000sqm space for a new primary school
Homes	1,400 new homes (500 affordable)
Jobs	About 20,000 new jobs
Transport improvements	• Taxi ranks • Pedestrian routes • Cycle Network and parking • Interchange within Victoria station • Victoria Coach Station
Public realm	• New civic square
Completion Date	—

East Croydon

East Croydon is a key multimodal interchange located in Croydon Town Centre in South London. The station acts as the gateway to London for the majority of rail services from Sussex. The railway station has an annual entrance and exit of 25 million customers with an additional 5.5 million interchanges taking place within the station. Large numbers of these customers arrive at the station by local tram and bus routes.

Part of a wider Croydon masterplan and opportunity area, East Croydon is being developed to provide high-density housing and office space to support the surrounding townscape.

East Croydon station (proposed)

Location	South London
Station owners	Network Rail
Station interchanges	London Trams and National Rail (Southern and Thameslink)
Wider interchange	Buses and cycling
Landmarks and heritage assets	• No. 1 Croydon: office tower
Authorities	• London Borough of Croydon
Station improvements	• New relocated station with three additional platforms
Completion date	At planning stage (PACE 1)

East Croydon station (proposed)

Master plan (proposed)

Site size	325,000sqm
Commercial estate	• 93,000sqm of mixed-use development • 116,000sqm of office accommodation • 9,290sqm of retail, restaurant and leisure space • Boxpark Croydon: pop-up retail space
Homes	About 1,575 homes
Jobs	–
Transport improvements	• Highway improvements: rebuilt roads to make space for additional tracks • Tram infrastructure and network improvements
Public realm	• 10,000sqm station square • 18,000sqm of public realm improvements • Reconfigure interchange between pedestrians, trams, buses, taxis, kiss & ride, cycle parking and rail services
Completion Date	2033

Leytonstone

Leytonstone is a localised interchange hub in east London, comprising a London Underground station, bus interface on either side of the station and an out-of-station-interchange with London Overground.

One of the winners of the Mayor's Mini-Holland scheme, the London Borough of Waltham Forest has collaborated with us to create a new and improved public realm using the Healthy Street Approach, promoting the use of cycling to reduce car emission and improve air quality.

Leytonstone station

Location	East London
Station owners	Network Rail and TfL
Station interchanges	London Underground (Central line)
Wider interchange	Buses (two bus stations), cycling, taxi ranks and car park
Landmarks and heritage assets	• Leytonstone station: Alfred Hitchcock mosaics, locally listed
Authorities	• London Borough of Waltham Forest
Station improvements	• None
Lessons learnt	• No Step-free access • Good interchanges between modes • The A12 (constructed in the 1990s) has changed the landscape of the area and made it more car focused
Completion date	1856 and 1947

Leytonstone station

Master plan (proposed)	
Site size	1,376,000sqm
Master plan	• Mini-Holland Programme: Cycling and walking • Leytonstone town centre area improvements
Homes	Supporting the development of 500 homes
Jobs	–
Transport improvements	See public realm
Public realm	Objective: To make cycling and walking a more attractive and convenient option. Improve the public spaces and streets to make it a better place for the community, while increasing footfall and business opportunities. Output: • New (Copenhagen style) crossings at junctions and side roads • Improved layout and direction changes as well as traffic calming features and carriageway narrowing • New cycle parking facilities • Provide new public spaces in the form of pocket parks along the route • Improve the pedestrian street environment, including new street lighting, better signage and more wayfinding
Completion Date	2017

Canary Wharf

Canary Wharf is known as one the more transformative business districts since regeneration of the industrial area in the 1980s. Part of the Isle of Dogs and South Poplar Opportunity Area, Canary Wharf has more recently evolved to become a destination that demonstrates its affluence and provides a more inclusive sense of space.

With the planned introduction of the Elizabeth line, Canary Wharf will become a unique transport hub with three separate stations that form a wider transport hub with other modes. Further development will enable the area to support growth by contributing to housing and employment needs.

Canary Wharf station

Location	East London
Station owners	Network Rail and TfL
Station interchanges	Three stations: • Canary Wharf station: Elizabeth line • Canary Wharf station: London Underground (Jubilee line) 1999 and Jubilee line extension • Canary Wharf station – DLR 1991
Wider interchange	Buses, cycling and taxi ranks
Landmarks and heritage assets	• Canary Wharf business district • Canary Wharf Shopping Centre
Authorities	• London Borough of Tower Hamlets • TfL (highway and red routes)
Station improvements	Jubilee line extension: • 31,500 sqm new station • 14,700 sqm park Crossrail: • New Elizabeth line station • Oversite Development (OSD) • 100,000 sq ft of retail and leisure facilities • Roof Garden
Lessons learnt	Out of station interchange between LU, DLR, Elizabeth line
Completion date	• Canary Wharf Station – Elizabeth line 2021 Crossrail • Canary Wharf Station LU (Jubilee line) 1999 Jubilee line extension • Canary Wharf Station DLR 1991

Canary Wharf station

Wood Wharf (under construction)

Site size	128 acres
Commercial estate	• Mini-Holland Programme: Cycling and walking • Leytonstone Town Centre Area Improvements
Homes	3,600 new homes, up to 25 per cent affordable
Jobs	20,000
Transport improvements	• Section 106 funding towards the Elizabeth line station, DLR, bus infrastructure, highway improvements and cycle hubs
Public realm	• 36,000sqm of riverside parklands and gardens • Day and night economy: community entertainment events
Completion Date	2023

Rotterdam Centraal, The Netherlands

Located in the Netherlands, Rotterdam Centraal is one of the busiest interchanges in the country, serving different modes of transport, including Eurostar trains, Dutch intercity trains, buses, trams, metro, bicycles and cars. In 2007, the old station (built in 1957) was demolished to make way for a new and larger station, which officially opened in 2014.

A legacy of reconstruction, the station was upgraded to support increasing demand and unify the north and south districts segregated by the railway tracks. This provided the drive for large-scale development with a vibrant high-quality public realm that has served the locality and reinvigorated the local economy.

Rotterdam Centraal station

Location	Rotterdam, The Netherlands
Station owners	ProRail
Station interchanges	Intercity, Intercity Direct and Sprinter
Wider interchange	Cycling, buses, trams and taxi ranks
Landmarks and heritage assets	• Maritime Museum Rotterdam • Rotterdam Market Hall • Rotterdam Town Hall • Erasmus Bridge
Authorities	• Gemeente Rotterdam
Station improvements	• 46,000 sqm new station with north and south entrances • Station footbridge connecting 16 platforms • 10,000sqm of translucent solar panels • Retail amenities
Completion date	2014

Rotterdam Centraal station

Masterplan – Rotterdam Central District

Key stakeholders	• Municipality of Rotterdam • ProRail • Ministry of Infrastructure and the Environment • Dutch Railways • Rotterdam City Region
Site size	641,000sqm
Commercial estate	• 318,000sqm of workspace • 125,00 sqm hotel and urban entertainment
Homes	195,000sqm residential area
Jobs	–
Transport improvements	• 750-space underground car park • 5,200-space underground bicycle facility • Relocated tram stops • New bus station • New cycling routes
Public realm	• New civic square • 24-hour economy • Permeability: Connecting north (residential neighbourhood) and south (city centre) Rotterdam
Completion Date	2014

TfL guidance material

Urban planning and construction

Our Urban planning and construction webpage is a good start on finding out how approach urban design and protect our infrastructure.

There is an extensive library of reference materials, guidance and toolkits available on our website. Below are some of the main documents, all of which are available on tfl.gov.uk

Streets toolkit
- Accessible Bus Stop Design Guidance
- Kerbside Loading Guidance
- London Cycling Design Standards
- Station Public Realm Design Guidance
- Streetscape Guidance
- Sustainable Drainage Systems (SuDS)
- Urban motorcycle design handbook

Design and heritage
- Better Streets Delivered 1
- Better Streets Delivered 2
- Case studies

The Mayor's Transport Strategy
- Cycling action plan
- Freight and servicing action plan

- Mayor's Transport Strategy 2018
- Vision Zero action plan
- Walking action plan

Healthy Streets
- Guide to the Healthy Streets Indicators
- Healthy Streets check for designers
- Healthy Streets for London
- Healthy Streets survey
- Small Change, Big Impact

Liveable Neighbourhoods
- Liveable Neighbourhoods guidance

Strategic transport models
- London's Strategic Transport Models

Our open data
- Accessibility and toilets
- Air quality
- Bus, coach and river
- Cycling
- General
- Network statistics
- Oyster

- Planning
- Roads
- Tube
- Walking

Taxi and Private Hire
- Guidance for developers
- Mayor of London: Taxi and private hire action plan 2016

Design standards
- DLR
- Emirates Air Line
- Interchange signs standard
- London Buses
- London Overground
- London River services
- London Taxi and Private Hire
- London Underground
- Santander Cycles
- Street map design standard
- Trams
- Victoria Coach Station

Guidance for planning applicants
- Freight
- Highway works
- Our approach to assessment
- Planning obligations
- Roadworks and street faults
- Transport assessments
- Trip generation

Travel in London reports
- Integrated Impact Assessment
- London Travel reports
- Mayor's Transport Strategy evidence base
- Supplementary reports
- Travel in London

Legible London
- Legible London product range
- Yellow Book: A prototype wayfinding system for London

Additional guidance documents
- Pedestrian Comfort Guidance for London
- Crossrail Oversite Development: Places and Spaces property development
- London Underground Station Design Idiom

About TfL

Part of the Greater London Authority family led by Mayor of London Sadiq Khan, we are the integrated transport authority responsible for delivering the Mayor's aims for transport.

We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners' and helping to create a safer, fairer, greener, healthier and more prosperous city. The Mayor's Transport Strategy sets a target for 80 per cent of all journeys to be made by walking, cycling or using public transport by 204l. To make this a reality, we prioritise sustainability, health and the quality of people's experience in everything we do.

We run most of London's public transport services, including the London Underground, London Buses, the DLR, London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line. The quality and accessibility of these services is fundamental to Londoners' quality of life. By improving and expanding public transport and making more stations step

free, we can make people's lives easier and increase the appeal of sustainable travel over private car use.

We manage the city's red route strategic roads and, through collaboration with the London boroughs, we are helping to shape the character of all London's streets. These are the places where Londoners travel, work, shop and socialise. Making them places for people to walk, cycle and spend time will reduce car dependency, improve air quality, revitalise town centres, boost businesses and connect communities. As part of this, the Ultra Low Emission Zone scheme and more environmentally friendly bus fleets are helping to tackle London's toxic air.

During the coronavirus pandemic we have taken a huge range of measures to ensure the safety of the public. This includes enhanced cleaning using hospital-grade cleaning substances that kill viruses and bacteria on contact, alongside regular cleaning of touch points, such as poles and doors, and introducing more than 1,000 hand sanitiser points across the public transport network.

Working with London's boroughs we have also introduced Streetspace for London, a temporary infrastructure programme providing wider pavements and cycle lanes so people can walk and cycle safely and maintain social distancing.

At the same time, we are constructing many of London's most significant infrastructure projects, using transport to unlock much needed economic growth. We are working with partners on major projects like the extension of the Northern line to Battersea, Barking Riverside and the Bank station upgrade.

Working with Government, we are in the final phases of completing the Elizabeth line which, when open, will add 10 per cent to central London's rail capacity. Supporting the delivery of high-density, mixed-use developments that are planned around active and sustainable travel will ensure that London's growth is good growth. We also use our own land to provide thousands of new affordable homes and our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

We are committed to being an employer that is fully representative of the community we serve, where everyone can realise their potential. Our aim is to be a fully inclusive employer, valuing and celebrating the diversity of our workforce to improve services for all Londoners.

We are constantly working to improve the city for everyone. This means using data and technology to make services intuitive and easy to use and doing all we can to make streets and transport services accessible to all. We reinvest every penny of our income to continually improve transport networks for the people who use them every day. None of this would be possible without the support of boroughs, communities and other partners who we work with to improve our services.

By working together, we can create a better city as London recovers from the pandemic and moves forward.