



Poetry in Urban Infrastructure

Stephen O'Malley



proximity

[prok-sim-i-tee]

noun

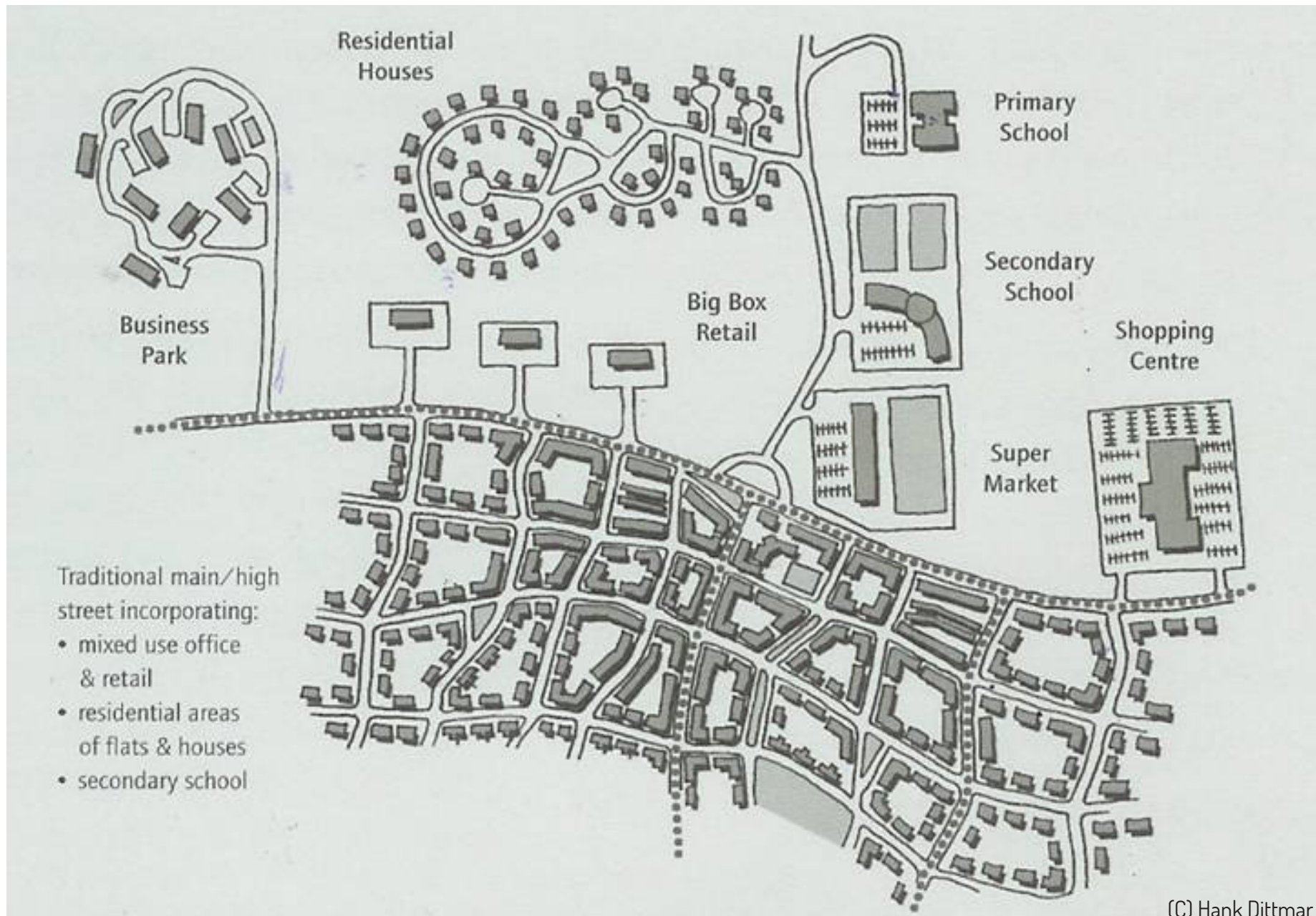
1. nearness in place, time, order, occurrence, or relation.



Proximity



Proximity





Proximity

THE RISE OF INNOVATION DISTRICTS

A New Geography of Innovation in America

FOR THE PAST 50 YEARS, THE LANDSCAPE OF INNOVATION HAS BEEN DOMINATED BY PLACES LIKE SILICON VALLEY—SUBURBAN CORRIDORS OF SPATIALLY ISOLATED CORPORATE CAMPUSES, ACCESSIBLE ONLY BY CAR, WITH LITTLE EMPHASIS ON THE QUALITY OF LIFE OR ON INTEGRATING WORK, HOUSING AND RECREATION.

Bruce Katz and Julie Wagner



Proximity





A wider economic context:
accommodating
London's growth
whilst improving
'place'





Proximity

London is growing by...

6 new residents
every hour



That's a car load
every 40 minutes



or

2 Buses
every day



or

2 Tube trains
every week



Today the population is

8,600,000

and by 2030, it will be

10,000,000

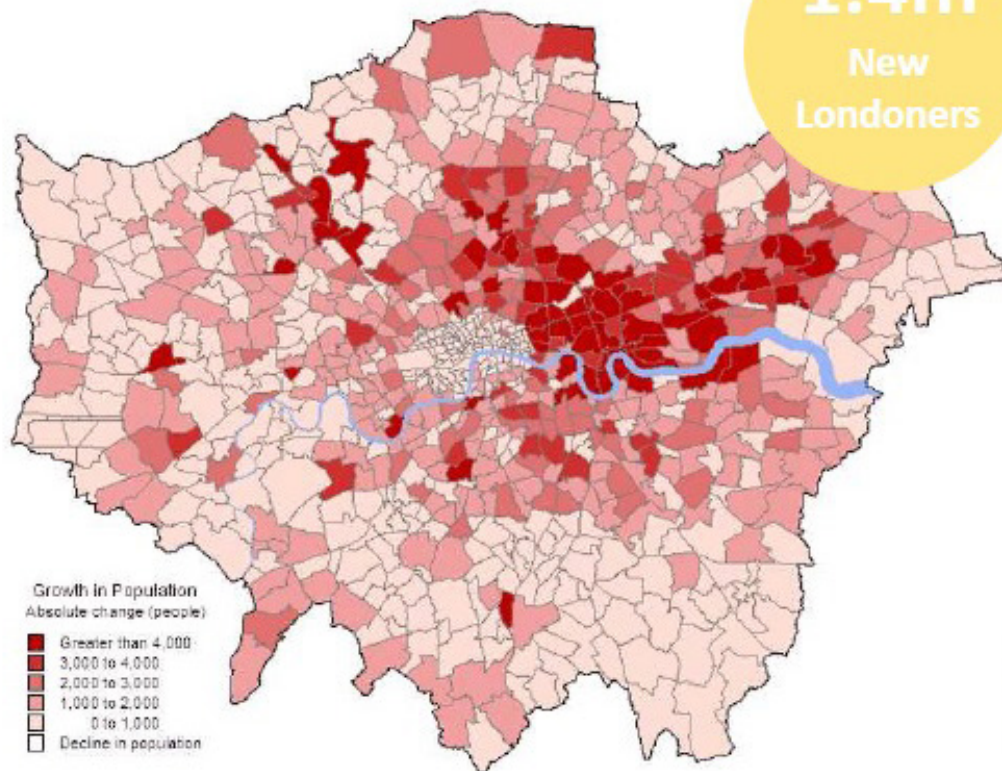




Ensuring population growth is productive growth

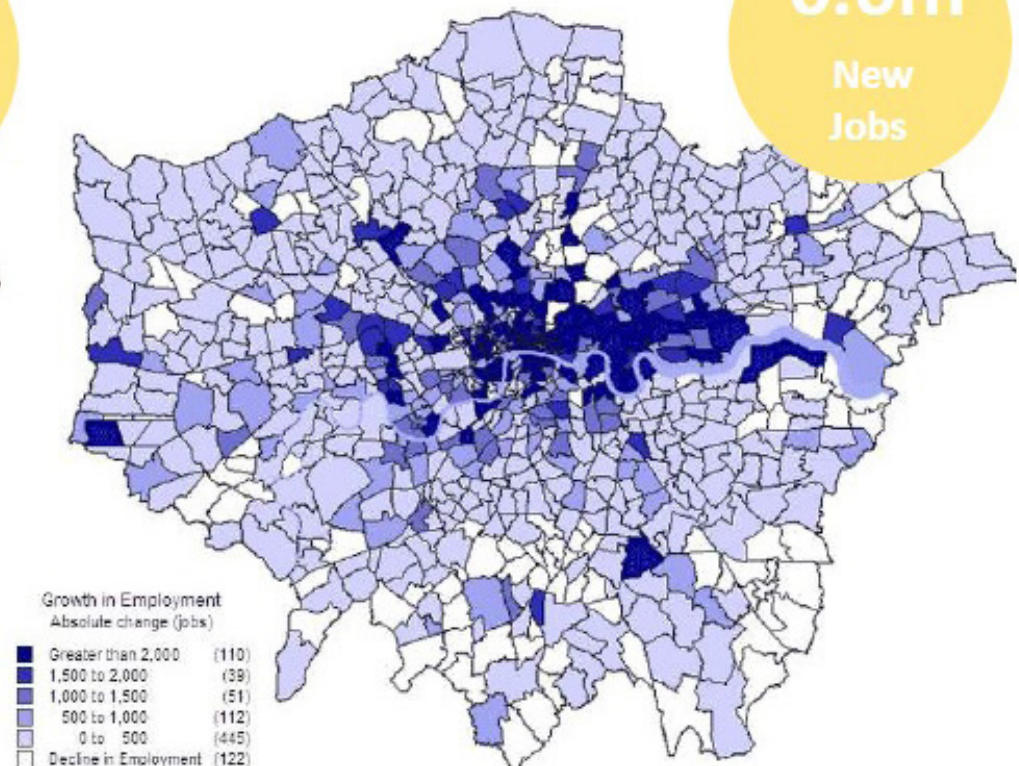
POPULATION (Growth to 2030)

1.4m
New
Londoners



EMPLOYMENT (Growth to 2030)

0.6m
New
Jobs

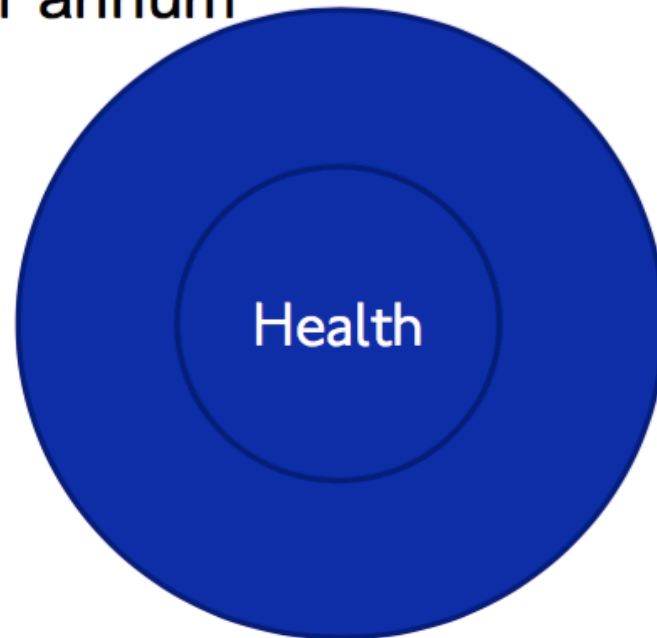




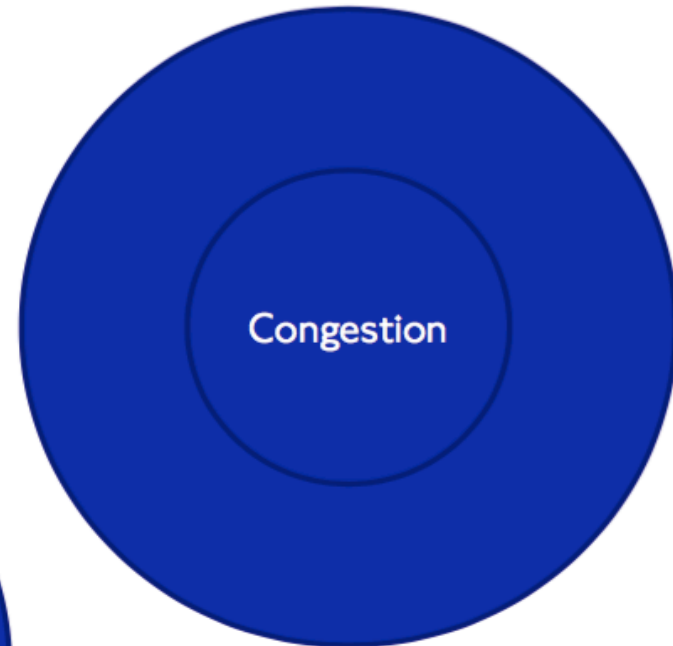
The size of the problem



£1.2 billion per annum
(zero injuries)



£4.2 billion per annum
(all 4.3m potential cycle trips daily)

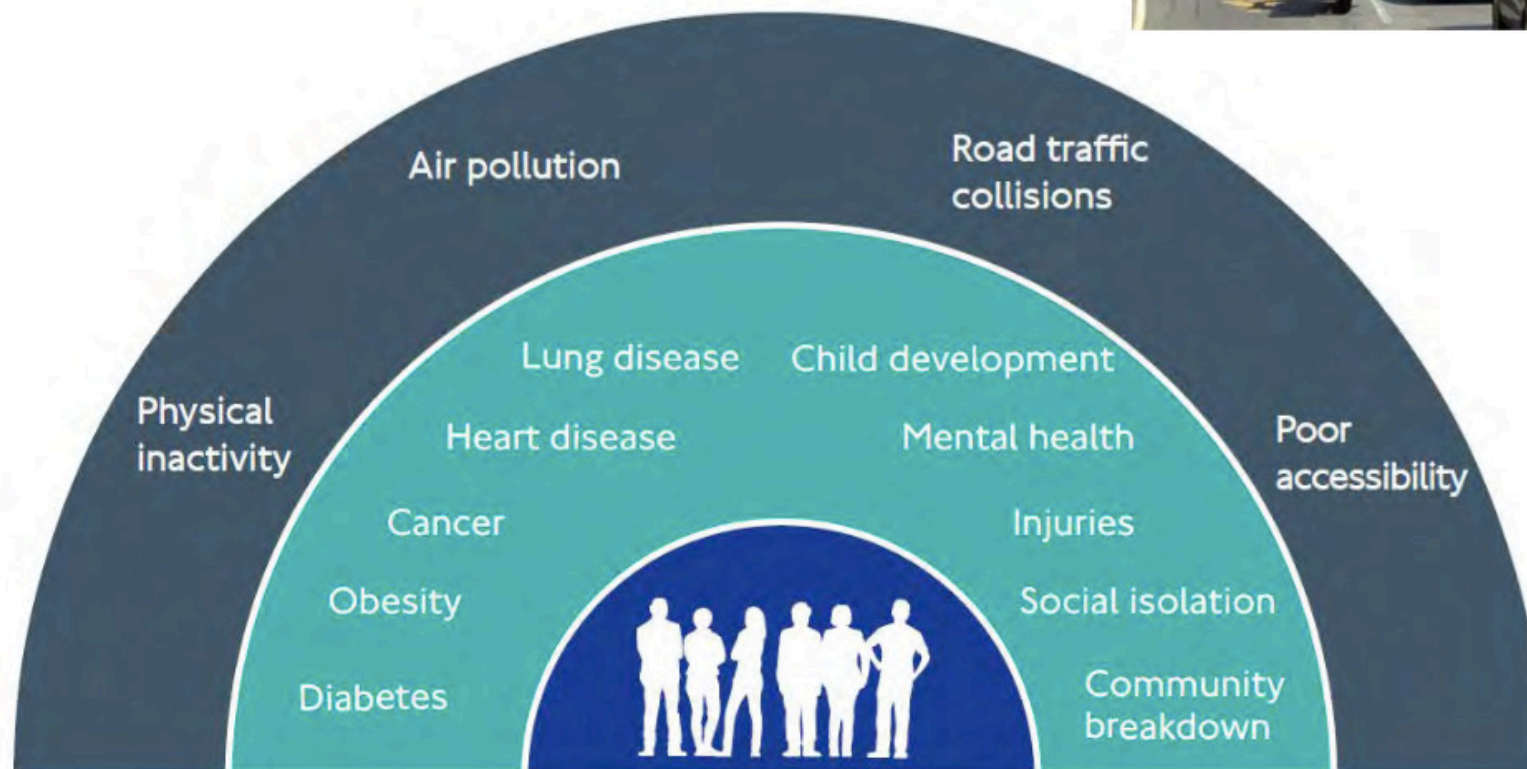


£4.2 billion per annum
(free flow conditions,
delay only)



Street environments & transport are central to the health of Londoners

The health impacts of the transport system in London relate mostly to **motorised road transport**





Proximity

The BIG 4

Nutrition

Smoking

Lack of
activity

Alcohol



Why is physical activity so important?

- **150 minutes of physical activity each week** reduces your risk of getting many of the most serious long term conditions
- 4 in 10 Londoners do not get the minimum physical activity each week that they need
- 1 in 3 Londoners don't get even 30 minutes of activity each week
- The **easiest way to stay active through life is walking & cycling as part of daily routine**
- The main way that people in London stay active is through walking (and some cycling)





How do we describe the impacts of transport schemes on health?





What is HEAT?

- * A World Health Organisation tool for monetising the health benefits of walking and cycling, due to increased physical activity levels.





intuitive

[in-**too**-i-tiv, -**tyoo**]

adjective

1. perceiving directly by intuition without rational thought, as person or the mind.
2. perceived by, resulting from, or involving intuition:
intuitive knowledge.
3. having a possessing intuition:
an intuitive person.



Intuitive

We need lots of stimuli



1000
stimulus
per hour

—
—

1 per every
4 seconds



Intuitive

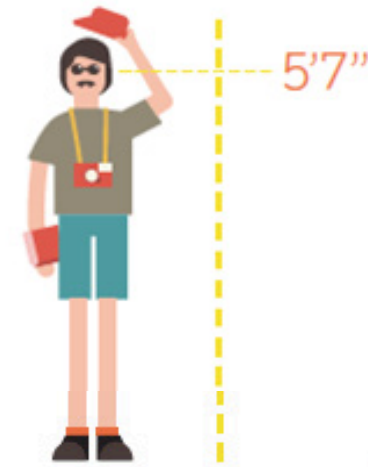
Human senses are a necessary planning consideration





Intuitive

The Human is small, slow and sensitive creature with a speed of 5km/h



(C) GEHL Architects



Intuitive

Allocation of space





Intuitive

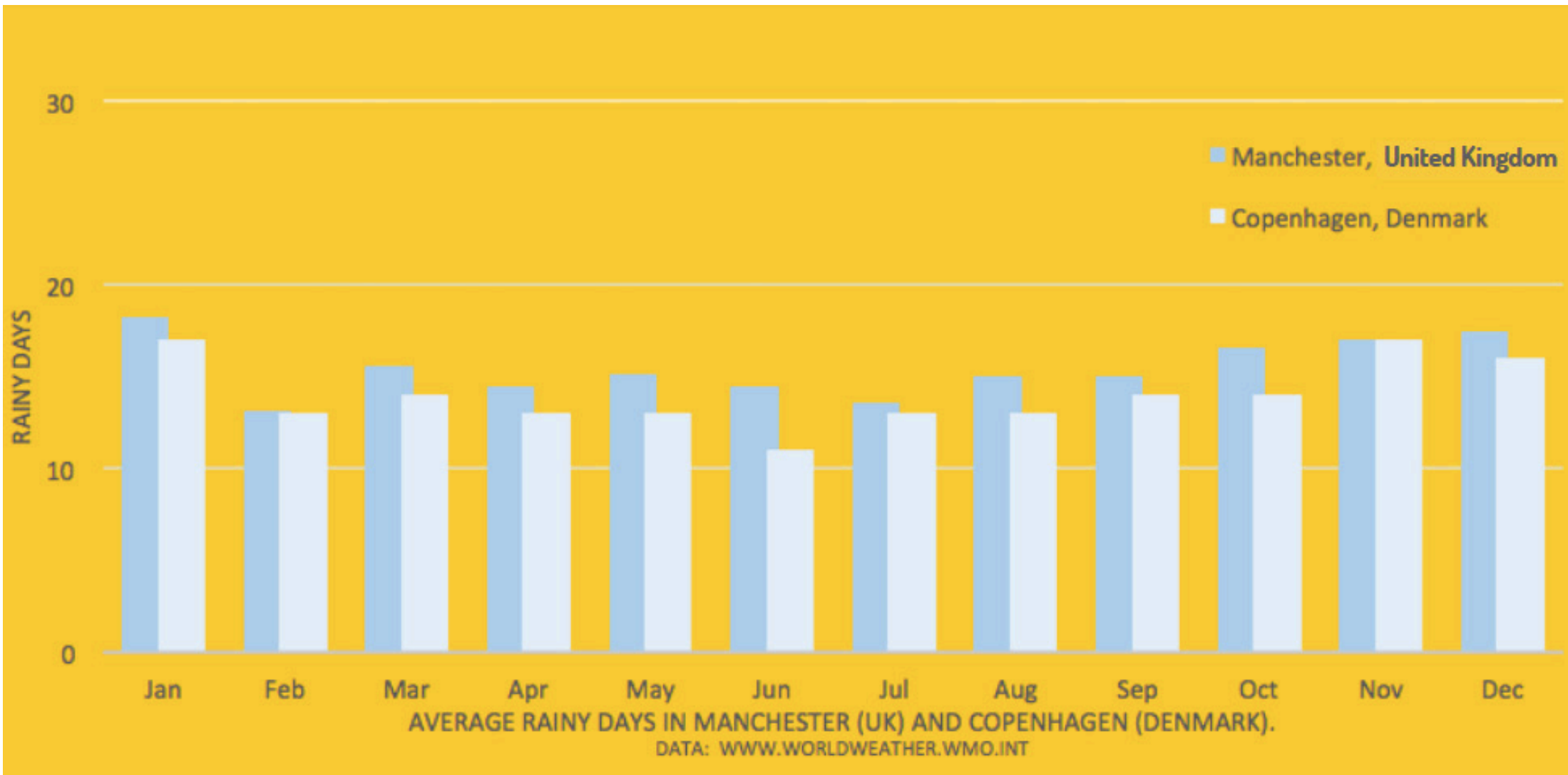
City seasons are different





Intuitive

City climates are similar





Intuitive

Cycling provision design speed – 13 mph / 20 kmph





Intuitive

A reimagined Whitechapel Road





Intuitive

Whitechapel Road the brief ...

‘Ambitious and transformational concepts are required for the Whitechapel Road which enable the future town centre to thrive as a destination for shopping, leisure, recreation, work and living, which meets the TfL requirements set out in the Whitechapel Road Outcome Plan creating a functioning, high quality area which prioritises the pedestrian.’



Intuitive

Whitechapel Vision

6 Key Place Transformations

-  Whitechapel Public Realm Enhancement
-  Over-station Development
-  New Civic Hub
-  New Public Open Spaces and Squares along proposed secondary 'loop'
-  Green Route
-  Major Development Sites
-  Key Routes





Intuitive

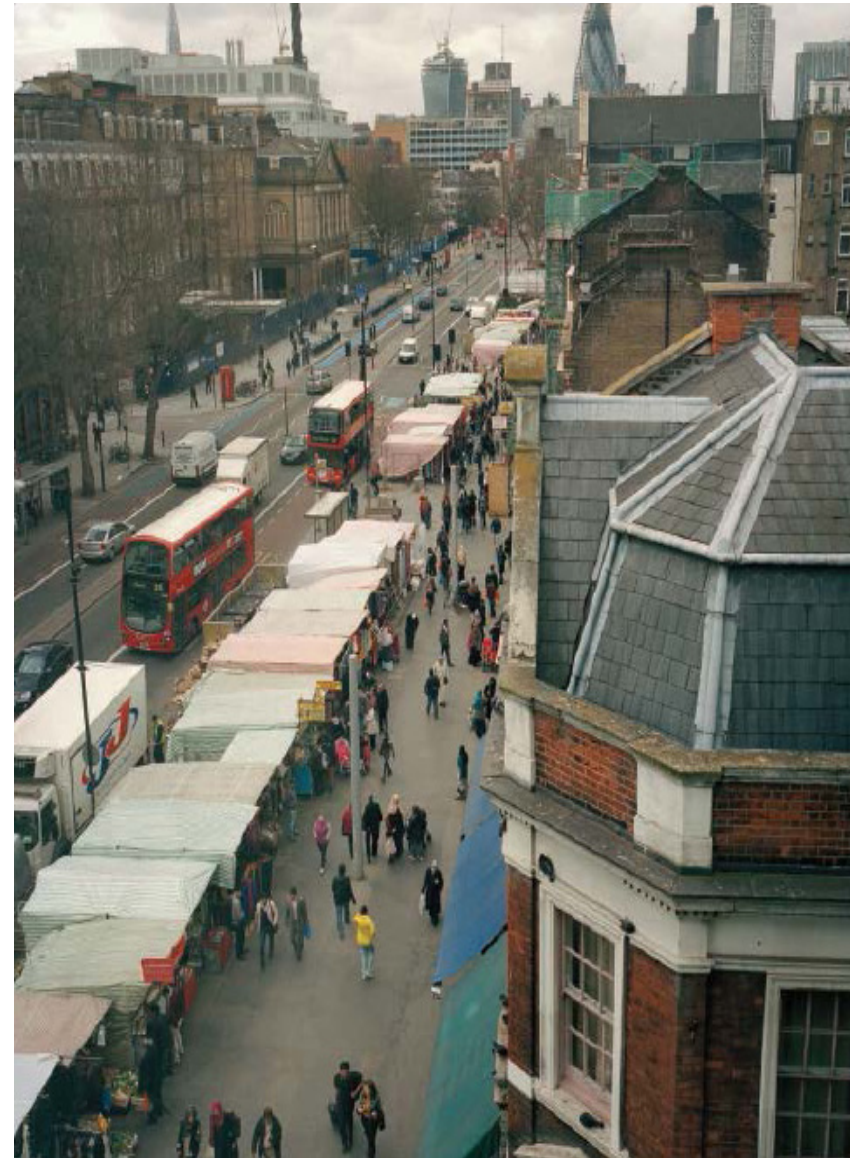
Population Behavior Trends





Intuitive

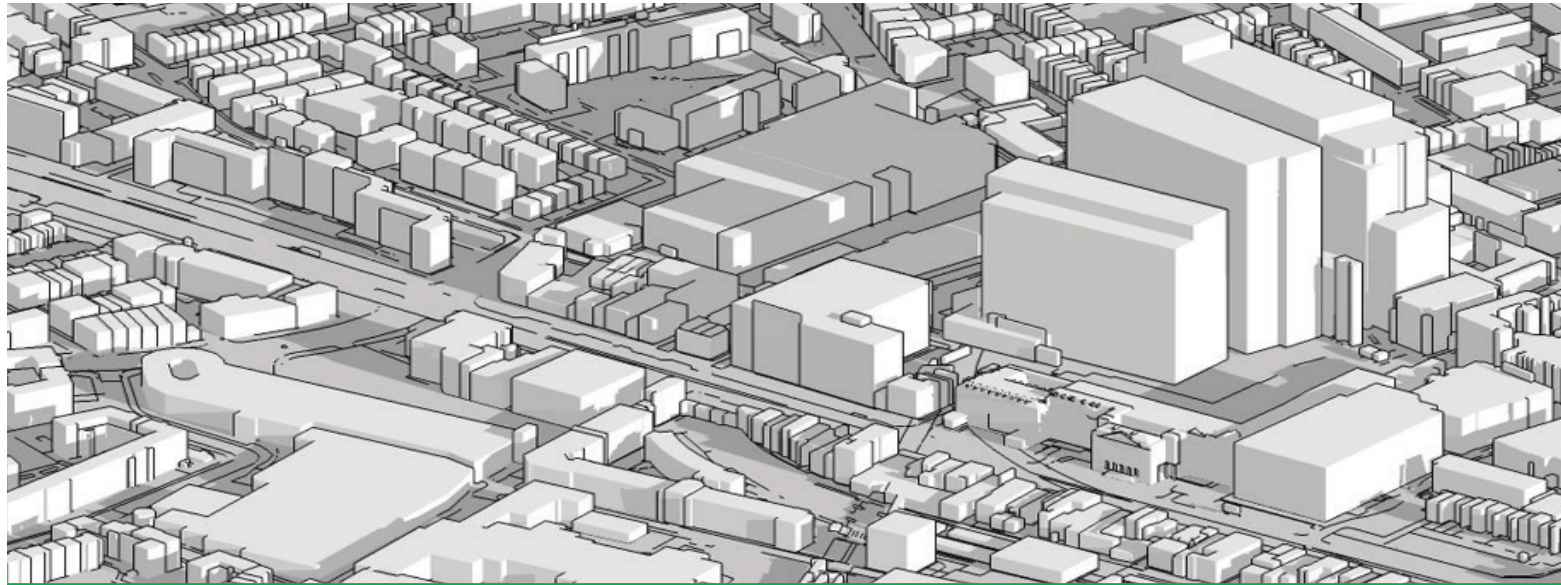
Market





Intuitive

Future Development Density





Intuitive

Pedestrian Behaviour





Intuitive

Pedestrian Comfort Level

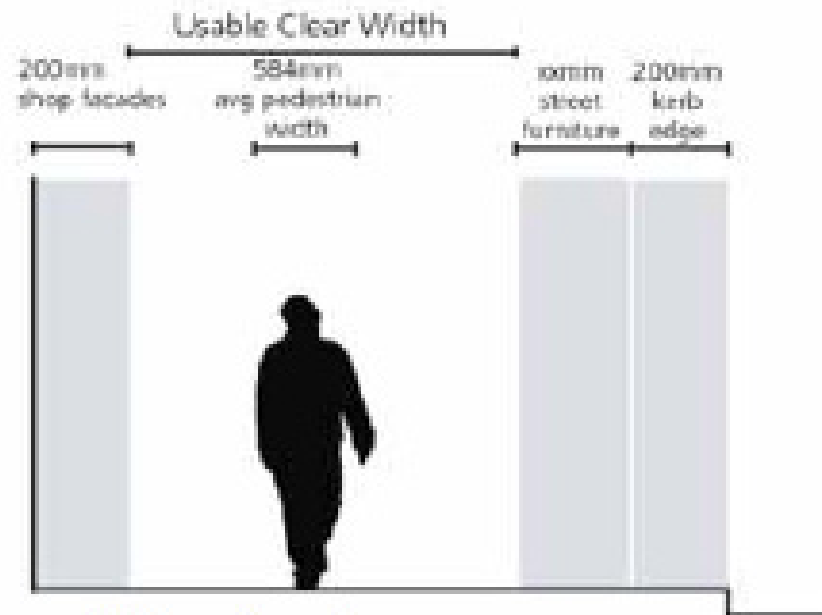


Figure 33 Usable Clear Width on a footway section

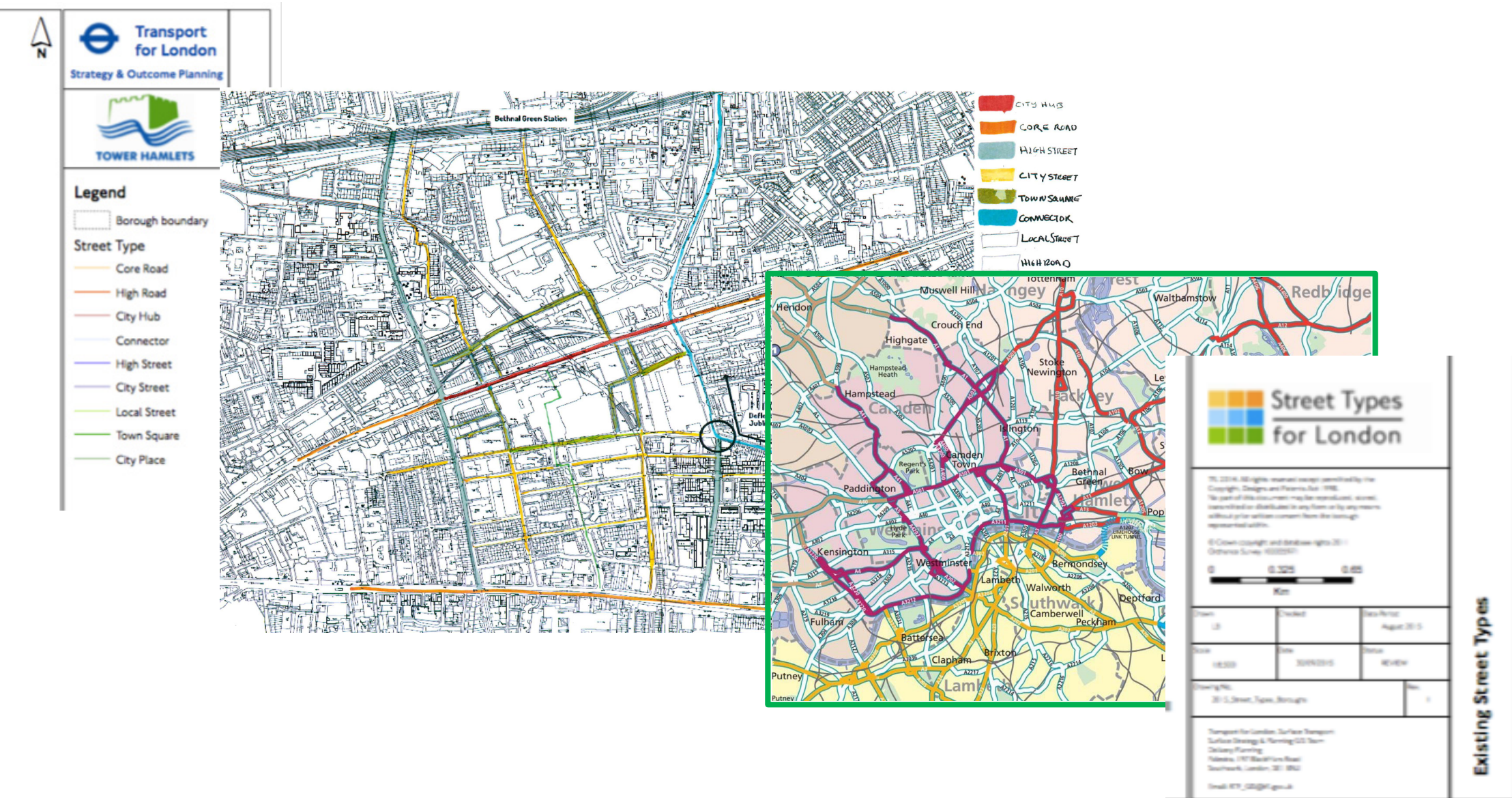


Figure 34 Pedestrian Comfort Levels on Footways



Intuitive

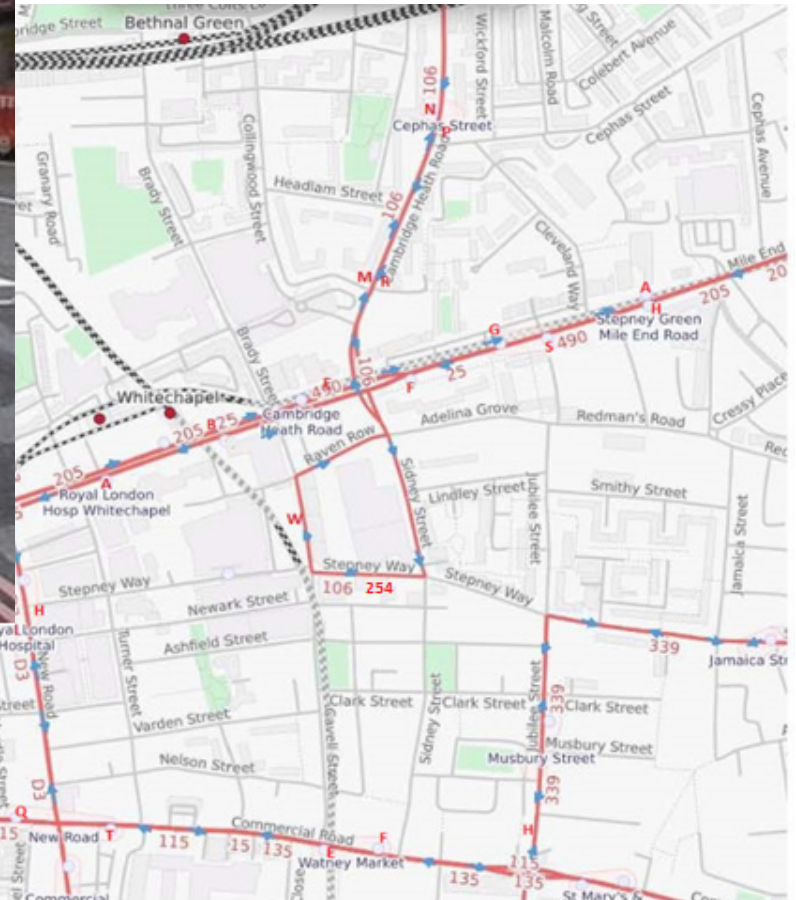
Road Network





Intuitive

Public Transport



Letter = Bus Stop

Blue arrow = Bus Direction

Bus routes = 25,106,115,254,205, 15,D3,15,135,339, N205,N253,N550,N15



Intuitive

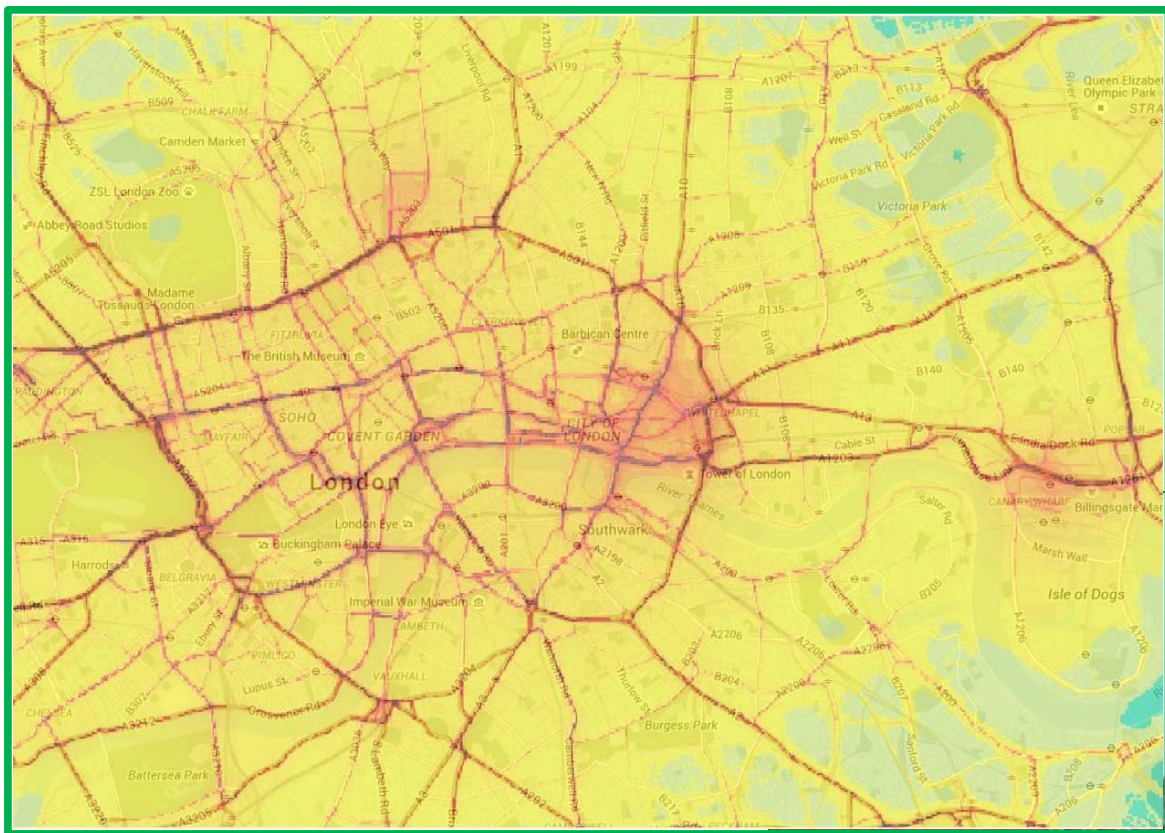
Cycling Infrastructure





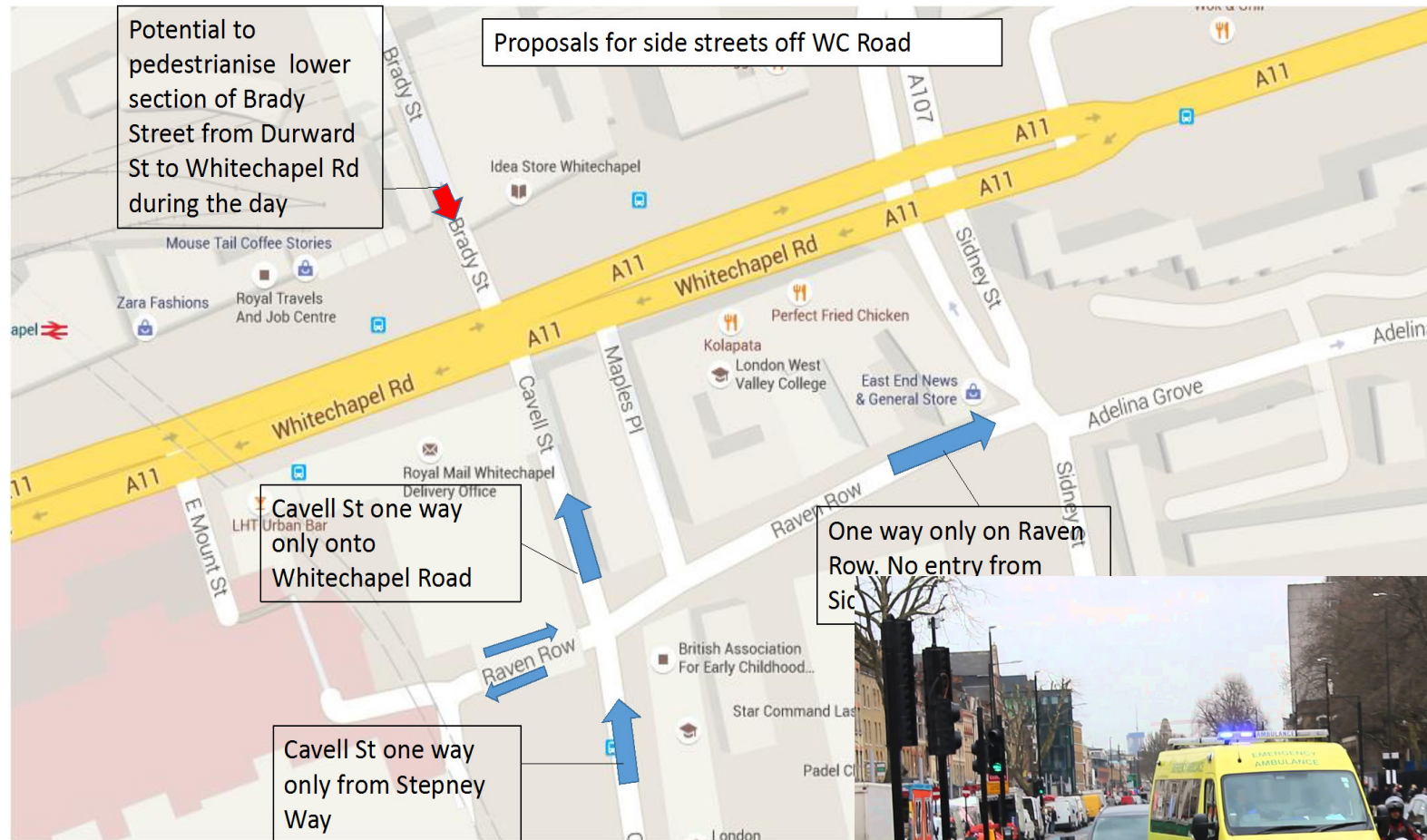
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Pollution



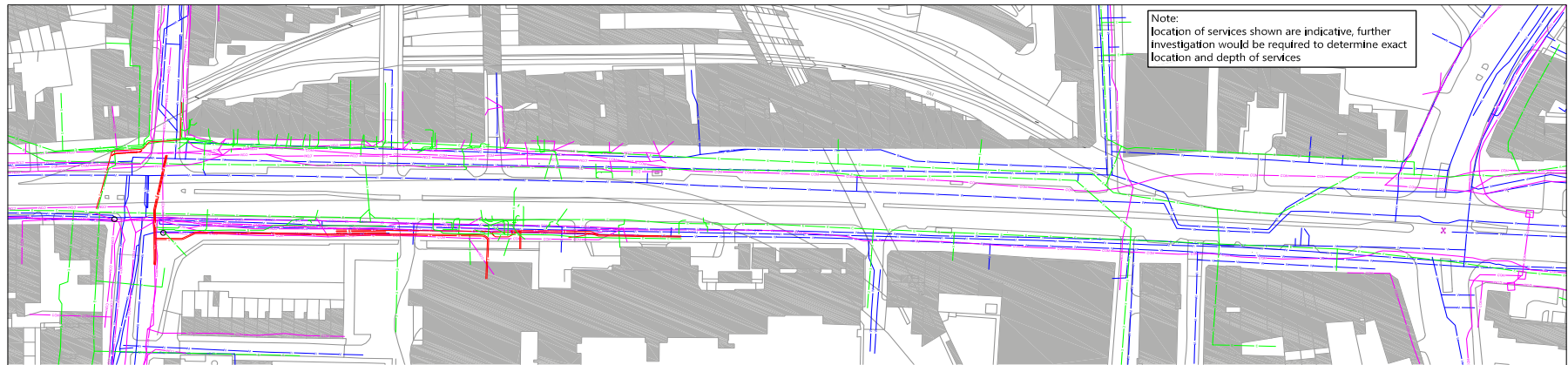


Hospital and Emergency Services

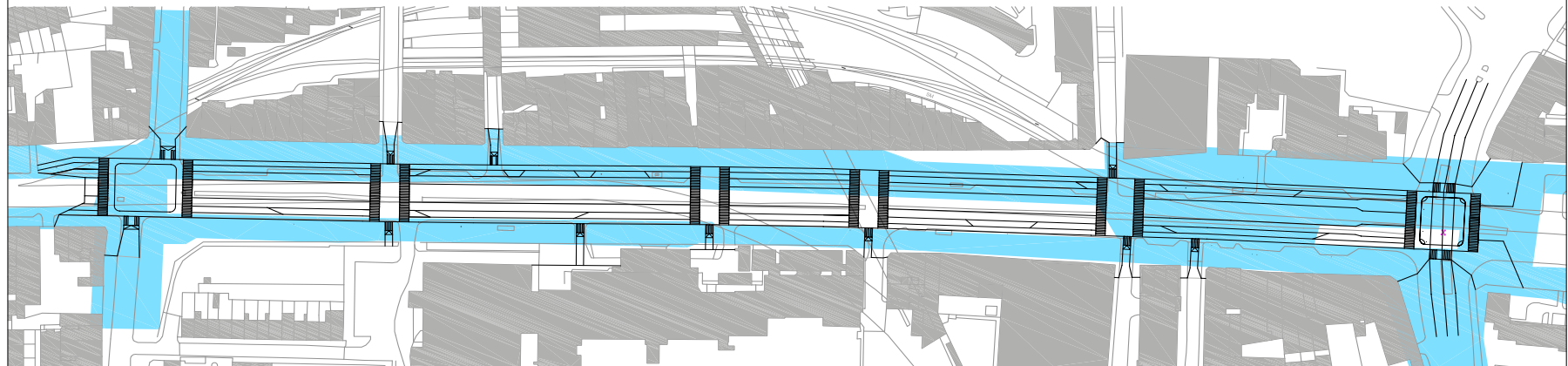




Whitechapel Road - Utilities



Existing Site Utilities



Extents of existing utilities overlaid with proposed Option 1






Whitechapel Road - Rail Infrastructure



Existing Tube & Rail Network

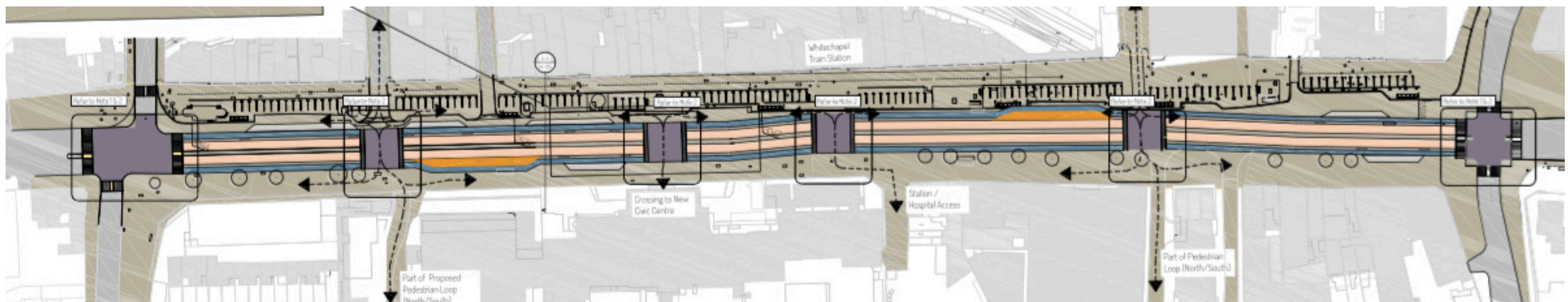
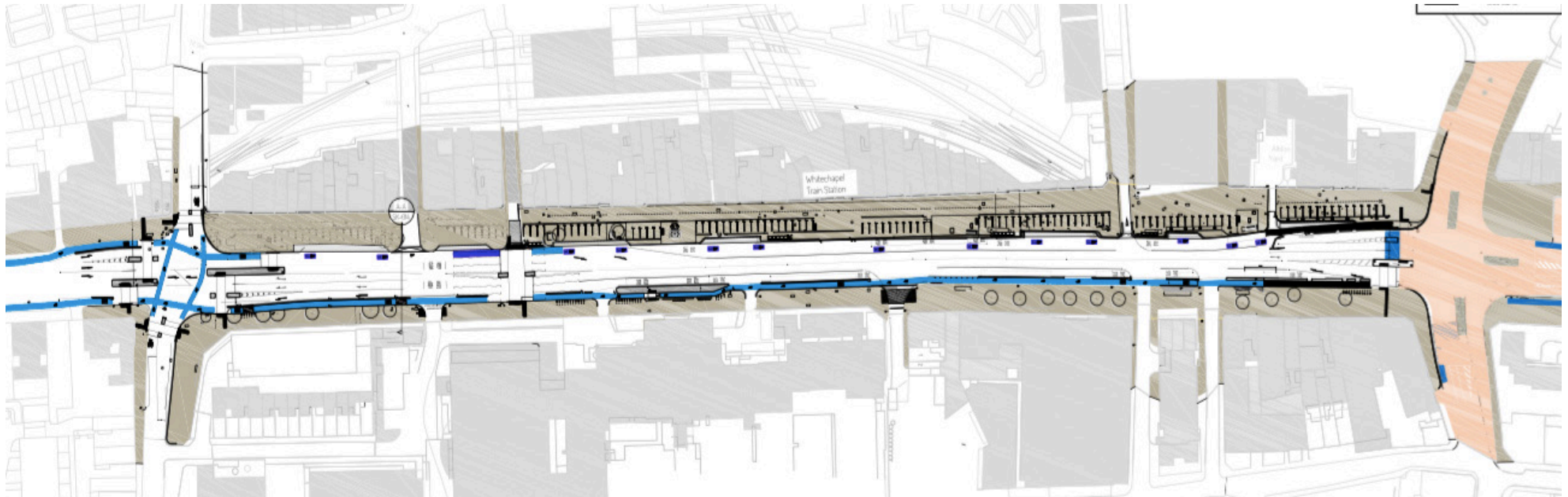
Key:

-  Hammersmith & City and District Underground Network
-  National Rail Network (East London Line)
-  Non operational tunneling (generally used as service use)



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Whitechapel Road Now and Proposed





Whitechapel Road – London Cycling Design Standards

London Cycling Design Standards

Contents

2. Tools and techniques

This chapter sets out network planning, route planning and implementation tools and techniques, showing how planning, design and delivery are related. All the tools described here are intended to serve the objective of efficiently delivering safer, more comfortable, direct, coherent, attractive and adaptable cycling infrastructure.



Preliminary - 13th April 2016

| Existing | Option 1 | Option 2 | Option 3 |
|----------|----------|----------|----------|
| 0 | 0 | 3 | 3 |



Intuitive

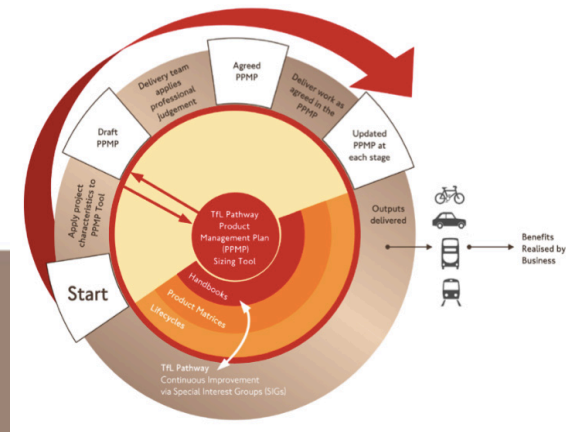
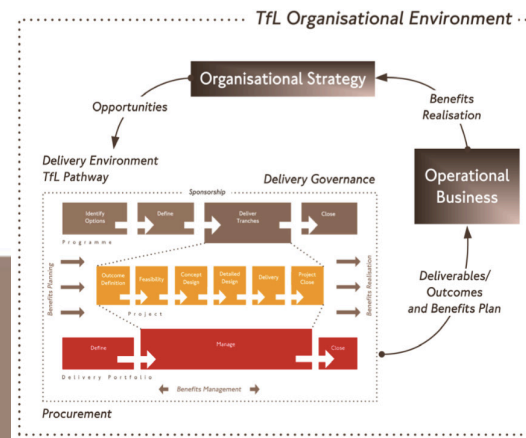
Whitechapel Road - Options Appraisal

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|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
| | EXISTING WHITECHAPEL ROAD | OPTION 1 | OPTION 2 | OPTION 3 | | | | | | | | | | |
| Road | Stop / start movement and acceleration associated with traffic lights. North / south severance with 4 lanes of traffic. | Stop / start movement and acceleration associated with traffic lights. North / south severance with 4 lanes of traffic. | Stop / start movement and acceleration associated with traffic lights. Although the junctions have been simplified to straight across crossings | More consistent flow of traffic with lower speeds as drivers will negotiate junctions with more caution. No red time at junctions making them more efficient | | | | | | | | | | |
| Pedestrians | Limited space available for pedestrians, highways dominate the space, vehicles have priority at all junctions including minor side roads. North south crossings limited | Crossing opportunities at Turner Street, Station Entrance (Civic Centre), Hospital and Cavell Street / Brady Street to facilitate the pedestrian loop. Central median for safer informal crossing subject to positioning of planting or other fixed structures | Crossing opportunities at Turner Street, Station Entrance (Civic Centre), Hospital and Cavell Street / Brady Street to facilitate the pedestrian loop. Central median for safer informal crossing subject to positioning of planting or other fixed structures. Low crossover at crossings | Crossing opportunities at Turner Street, Station Entrance (Civic Centre), Hospital and Cavell Street / Brady Street to facilitate the pedestrian loop. Central median for safer informal crossing subject to positioning of planting or other fixed structures. Increase pedestrian comfort levels on north side. Low crossover at crossings | | | | | | | | | | |
| Bus | Bus stops hidden by market, sharing space with bins. Bus lane on south is operational only at peak morning / evening. Unattractive waiting environment. Potential for conflict with cyclists on the | Dedicated bus lanes one either side for more reliable bus times. Floating bus stops more visible from station. | No bus lane, passing points, allows overtaking. Floating bus stops more visible from station | Lack of dedicated bus lane can add to congestion. Floating bus stops on the north more visible from station and less conflicts | | | | | | | | | | |
| Station & Crossrail | Existing passenger numbers now accessing the intermediate station along Court Street places high pressure on available pavement space particularly within and around the market | Forecast passenger numbers will increase footfall into station creating pinch points at market and station entrance interface, lower pedestrian comfort levels. Crossings will assist north / south movement | Wider set access to crossing (crossings) movement | | | | | | | | | | | |
| Cycling | Dedicated cycle way segregated from carriage way on south side, cyclists sharing carriageway space with buses on north side | Dedicated cycle way segregated from carriage way, lower vehicle speeds for more cycle friendly environment. Crossing points will slow cycling speeds and encourage more casual cycling | Dedicated carriage way more cycle points to a crossing | | | | | | | | | | | |
| Road safety | 4 lanes of traffic to negotiate. Fast moving traffic. No traffic island to act as a refuge when crossing informally. Accidents associated with informal crossing complicated junctions. Non segregated cycle lane on the north side | Increase crossing points, slower vehicle traffic, dedicated cycle lane, for safer cycling. Lower cycling speeds to be cycling. L | Increase crossing points, slower vehicle traffic, dedicated cycle lane, for safer cycling. L | | | | | | | | | | | |
| Pollution | Stop start at lights and acceleration higher emissions and general queue traffic | | | | | | | | | | | | | |
| Public Realm | Pedestrians marshalled into cordoned spaces, manoeuvring around dominant highway, poor quality surfaces and pedestrian environment generally | | | | | | | | | | | | | |
| Market | Additional crossing points, more even distribution of footfall. Opportunities to reconfigure market stalls to capture north / south movements. Limited opportunity for crossing north / south | | | | | | | | | | | | | |
| Retail | North side constrained and overcrowded between shop fronts and market | | | | | | | | | | | | | |
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Intuitive

Whitechapel Road - TFL Project Pathway



When to do a Business Case?

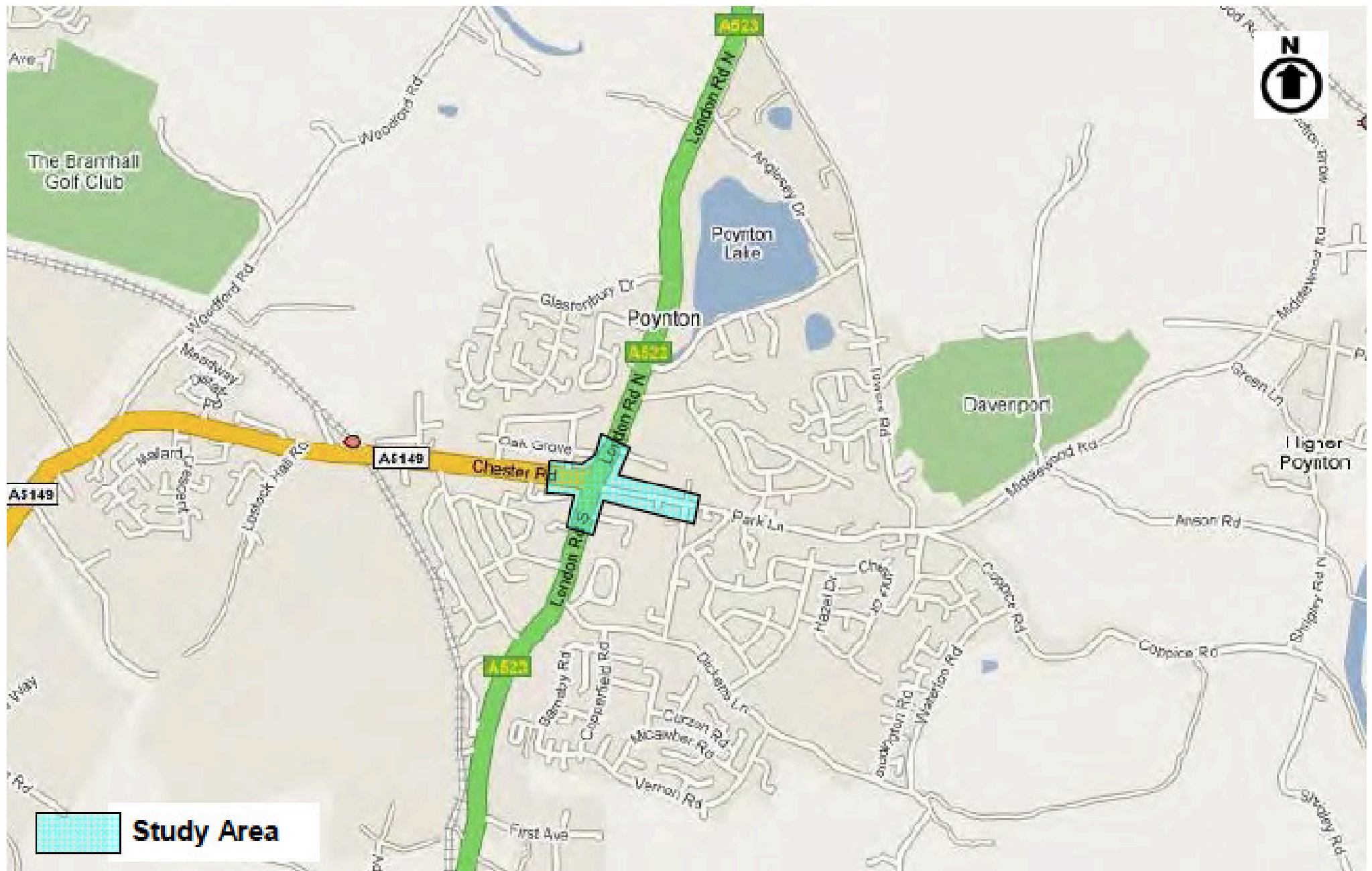
A Business Case (BC) is required as part of the Pathway Project Lifecycle for projects, programmes and portfolios with an estimated financial cost >£2m budgeted or £1m if unbudgeted.

Business Cases are required at stages 1, 2, 4 and after benefits realisation





Intuitive





Intuitive





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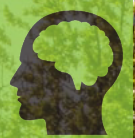
Intuitive





Intuitive





Intuitive





resilient

[ri-**zil**-yuh nt, -**zil**-ee-uh nt]

adjective

1. springing back; rebounding.
2. returning to the original form or position after being bent compressed, or stretched.
3. recovering readily from illness, depression, adversity, or the like; buoyant.



Resilient

The SuDS Manual





Resilient

SUDS & STREETSCAPE GUIDANCE

DRAFT V5
18_05_2016

TRANSPORT FOR LONDON



Resilient



Water quantity, permeability of surfaces



Water quality, reedbeds



Biodiversity, habitat creation



Image courtesy Jess Bastock

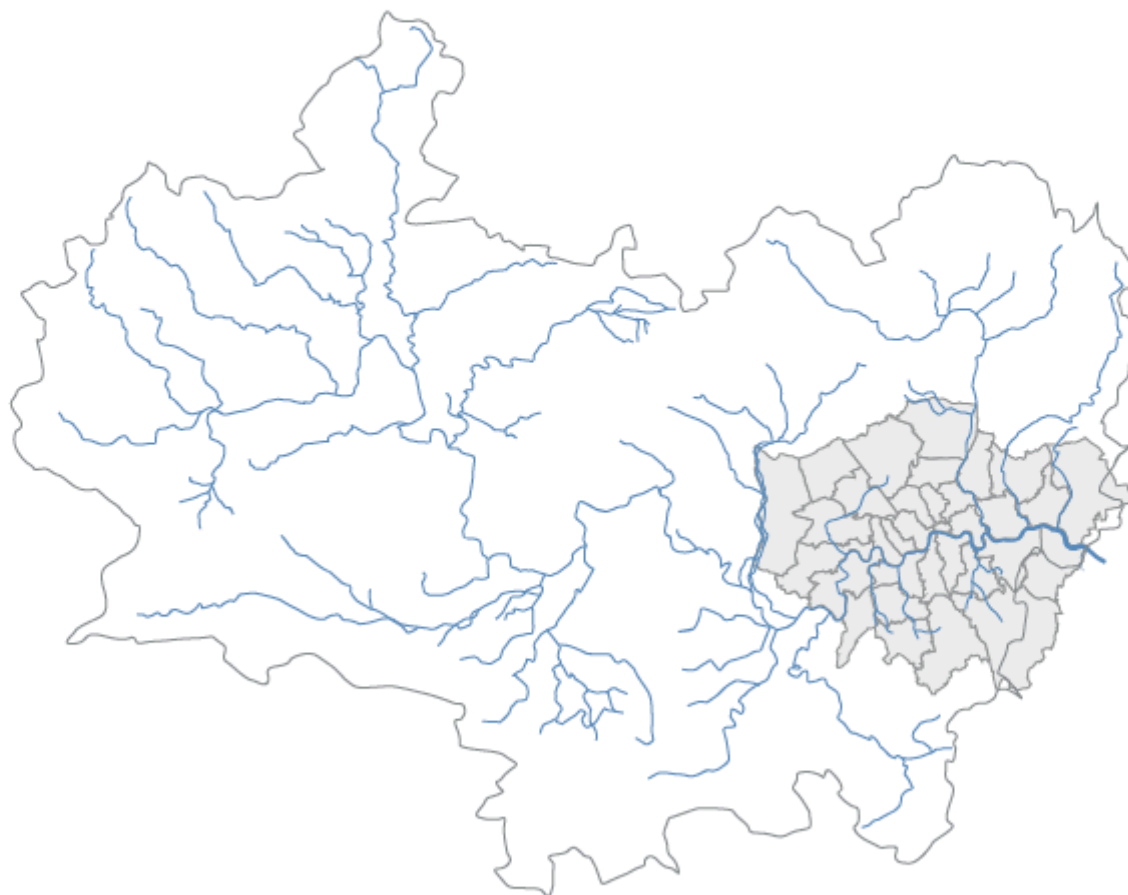
Amenity, taking ownership of the street



2.4 A catchment based approach

Management of flood risk is influenced by the diverse physical features of the catchment. London sits in the Thames Basin where the majority of rivers have been highly modified to carry water efficiently through artificial and straightened channels. There are nine major tributaries of the River Thames in London and 897 sub-catchment areas with individual characteristics. Due to development, the natural earth channel and flood plains of these rivers have been lost, and flooding can quickly result.

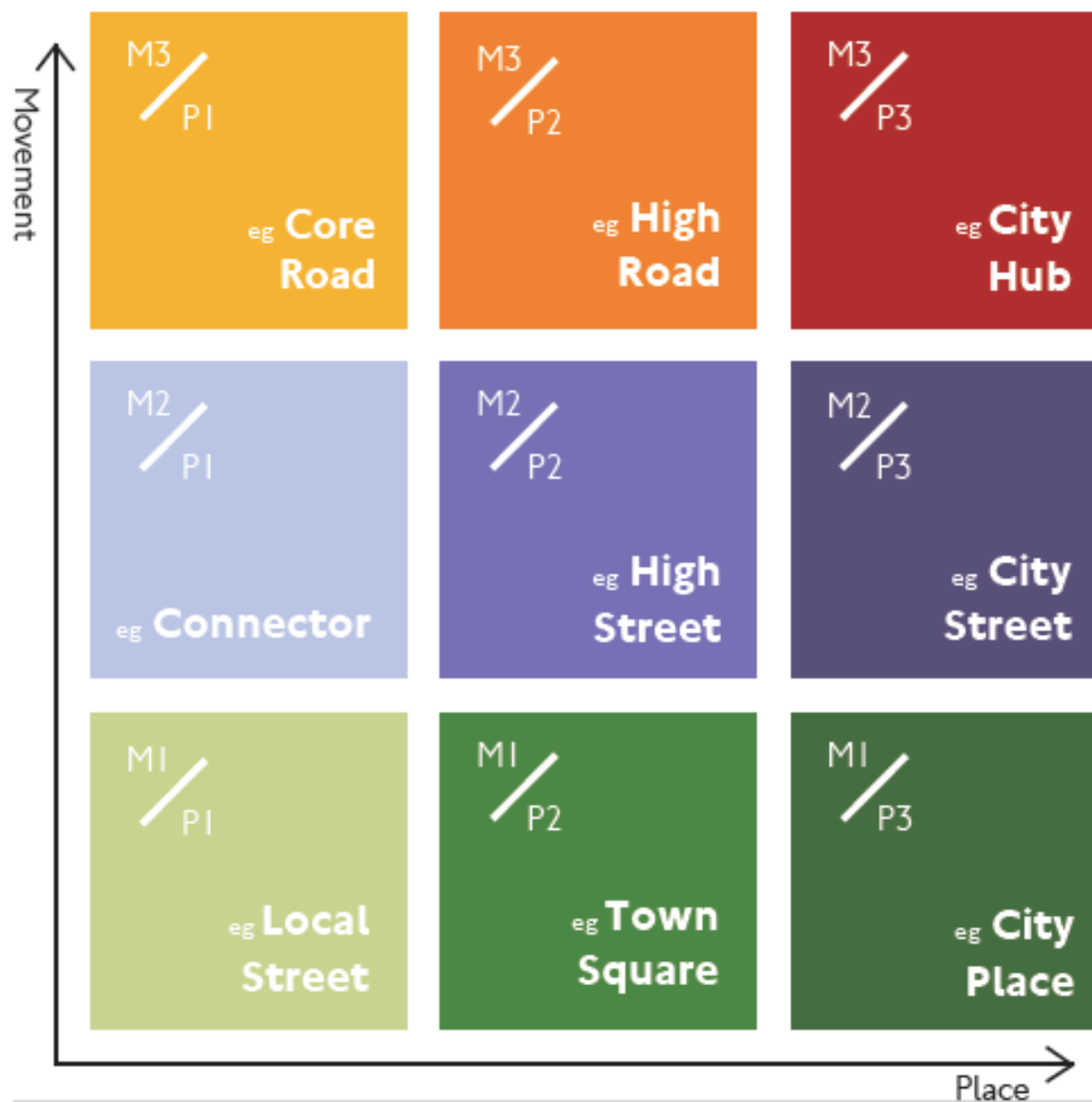
London has a mixed geology consisting of chalk, limestone, gravel, and clay. Within the sub-catchments soils and topography will vary considerably, and may have been highly modified.



The catchment of The Thames



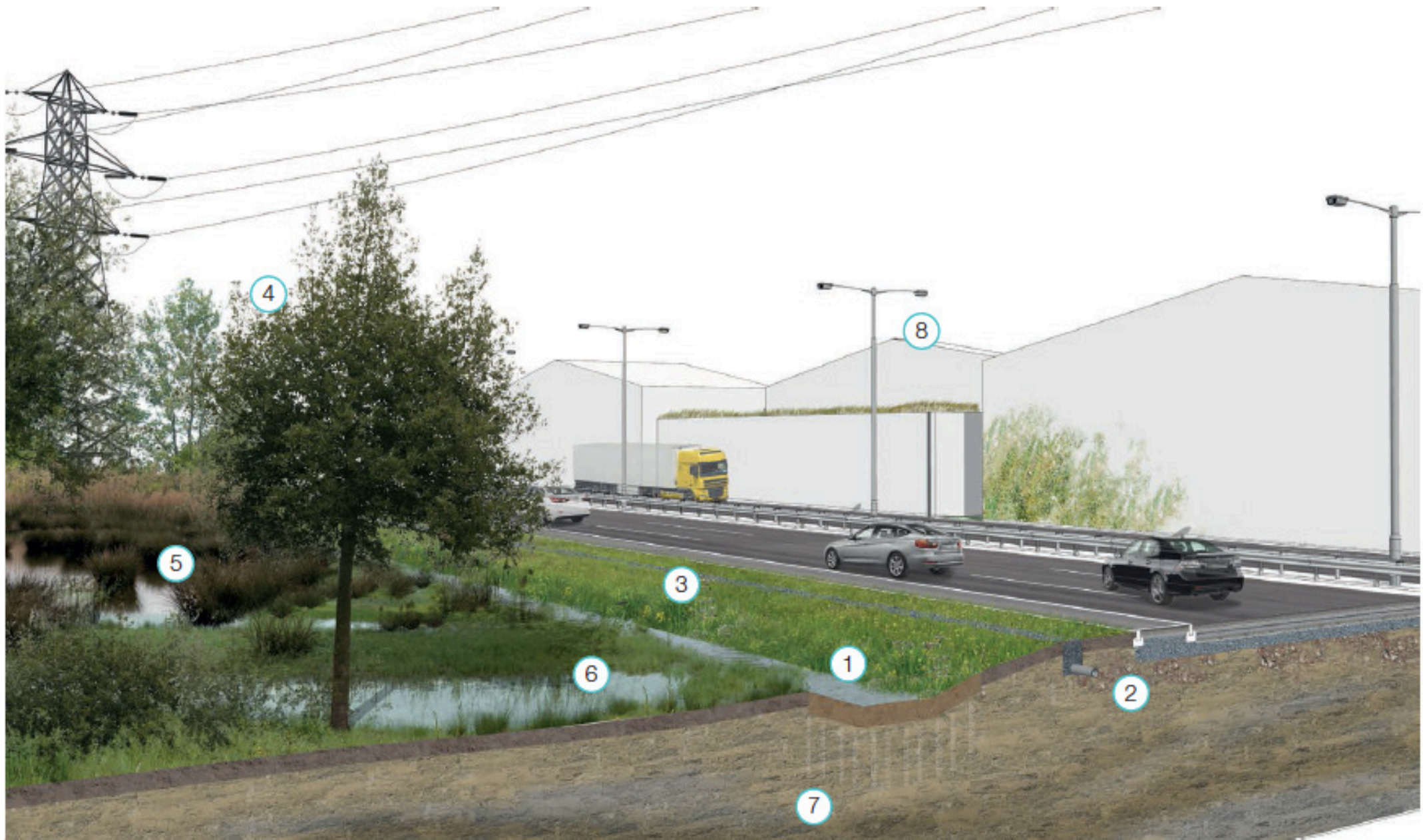
Resilient



TfL Street Types



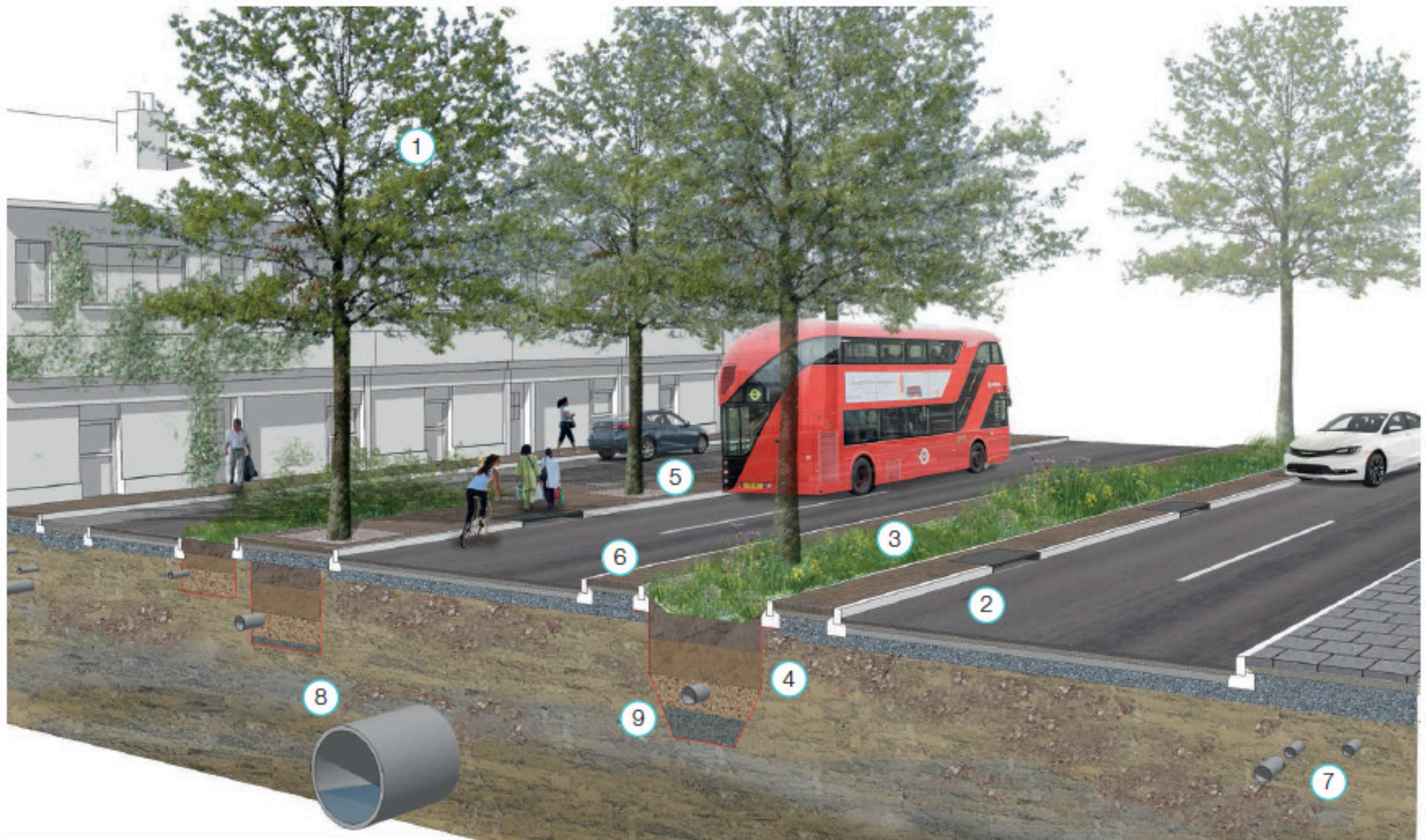
Resilient



Street Type M3/P1



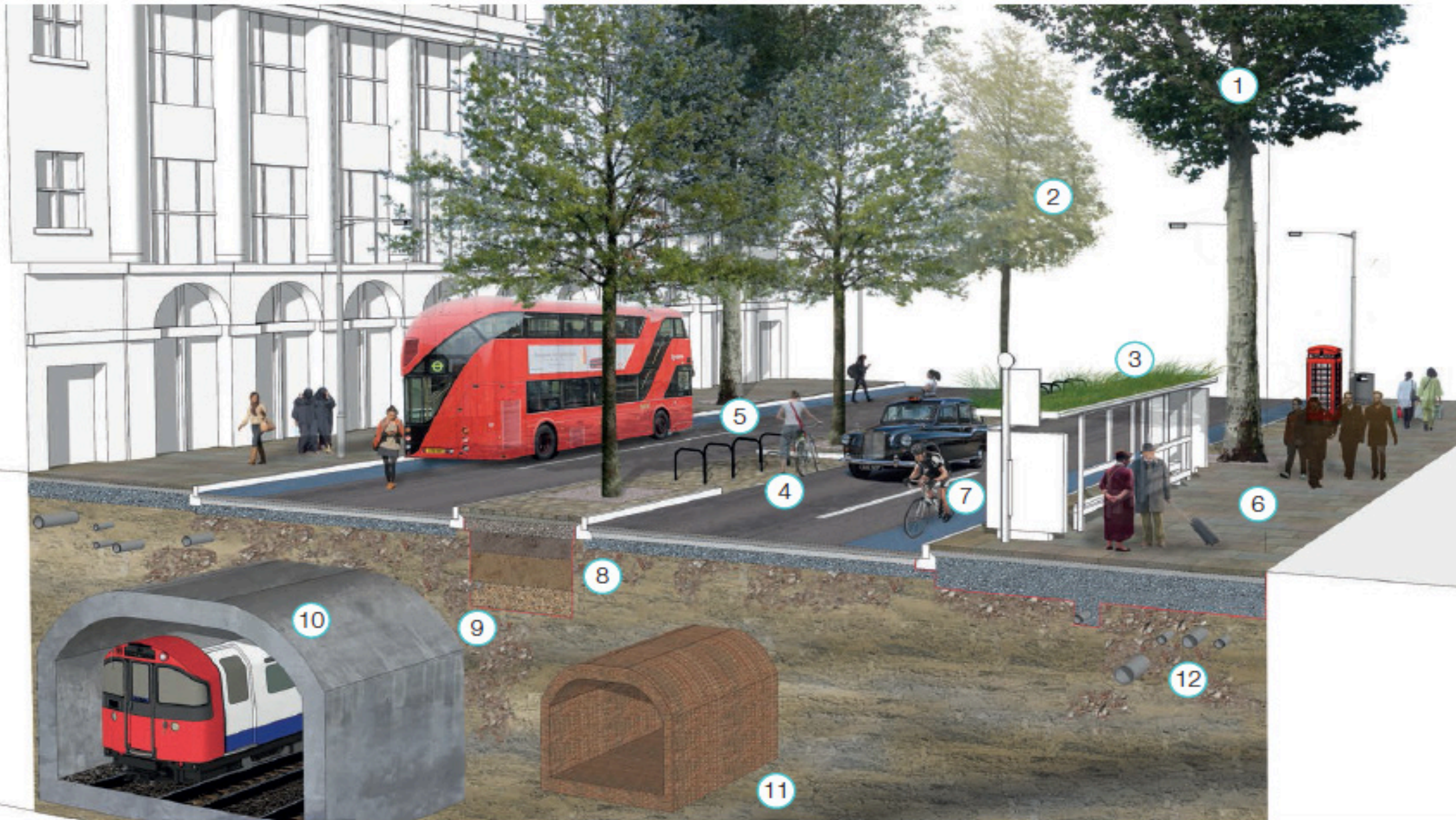
Resilient



Street Type M3/P2



Resilient



Street Type M2/P3



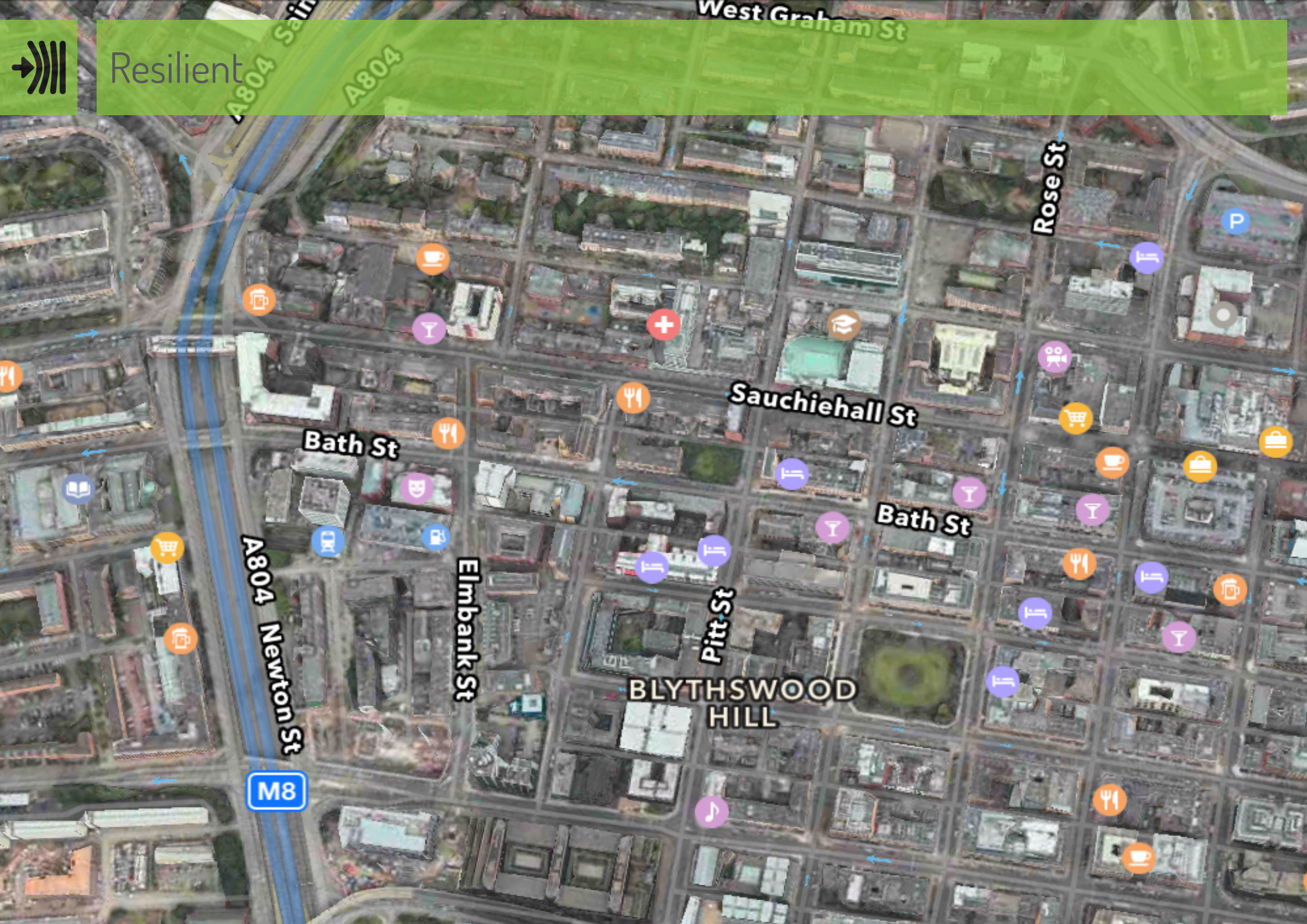
Resilient



Street Type M1/P2



Resilient

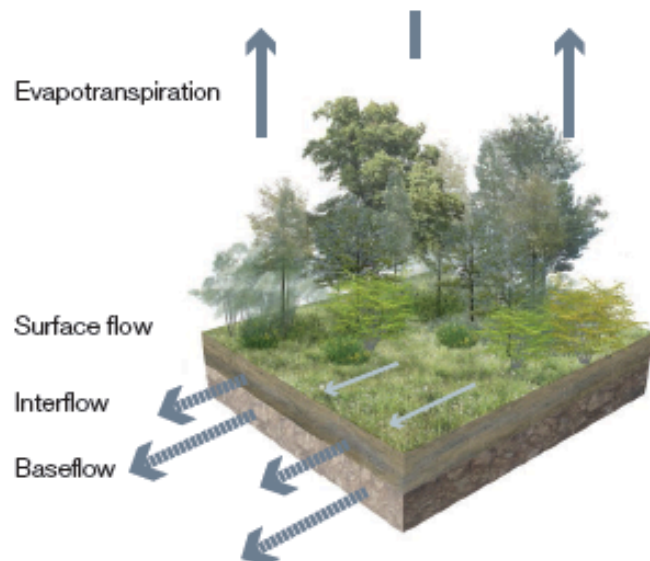


Civic Engineers – Sauchiehall Street SuDS Discussion Paper

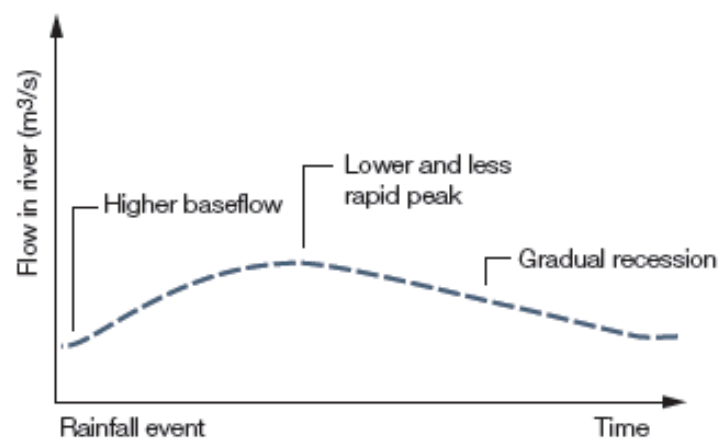


Sustainable urban Drainage Systems (SuDS)

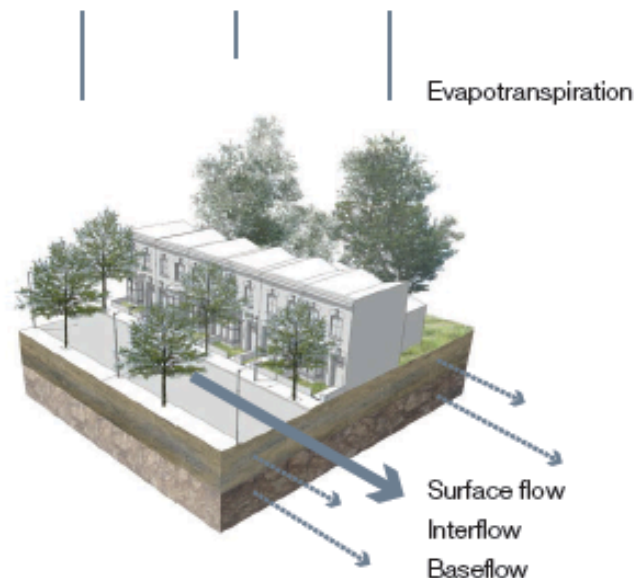
Naturally Draining Site



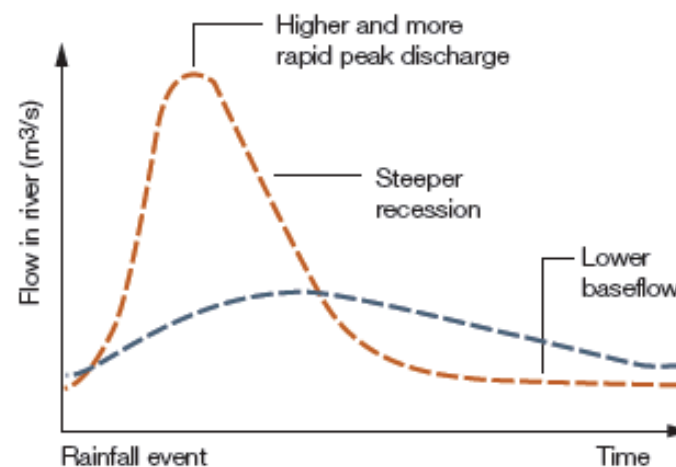
Greenfield



Urban Environment



Urban



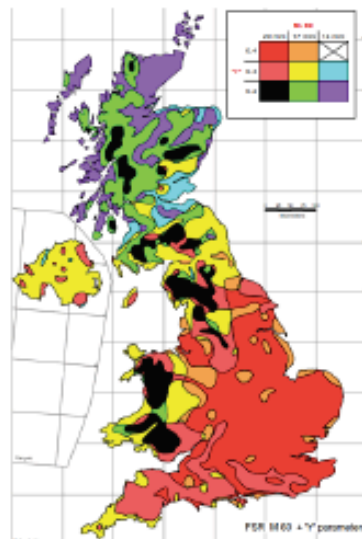
Sauchiehall Street Surface Water Analysis

Surface Water Run-Off Rates

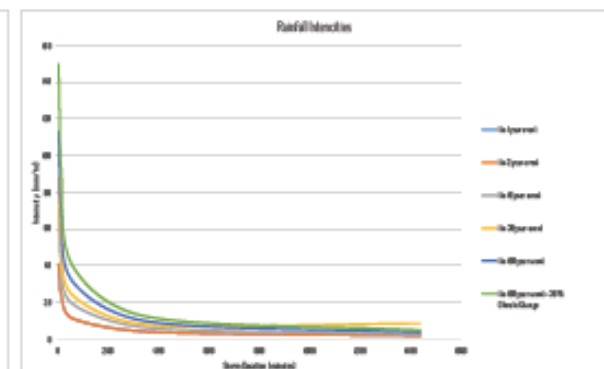
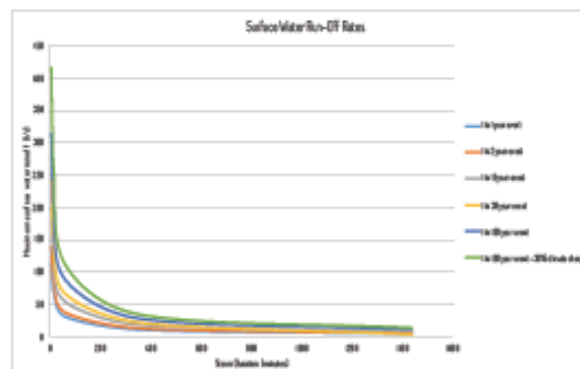
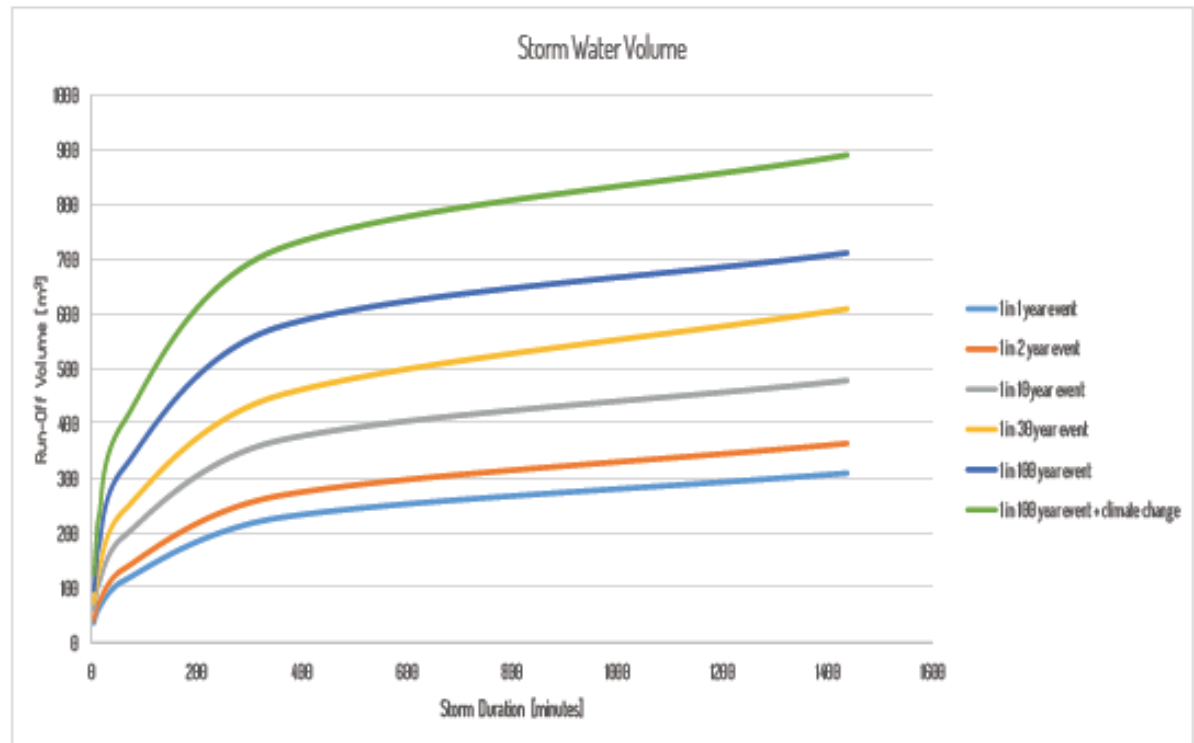
The Surface water Run-off rates for Sauchiehall Street have been calculated in accordance with the Wallingford Procedure, using the Glasgow specific variables:

M5-60 [mm] = 20
Ratio R = 0.025
Time of Entry = 5 minutes

The results below show the Surface water run-off rate for the hard standing /impermeable area for 1 hectare (10,000m²). The Tables show the calculated; rainfall intensity [mm/hour] and Run off Rates [litres/second] and Storm Water Volumes for different durations of storm event.



5 year 60 minute rainfall depth parameters of UK.



Calculated Storm Water Volume, Run-Off Rate and Intensities for 1 Hectare of Sauchiehall Street

Below Ground Considerations

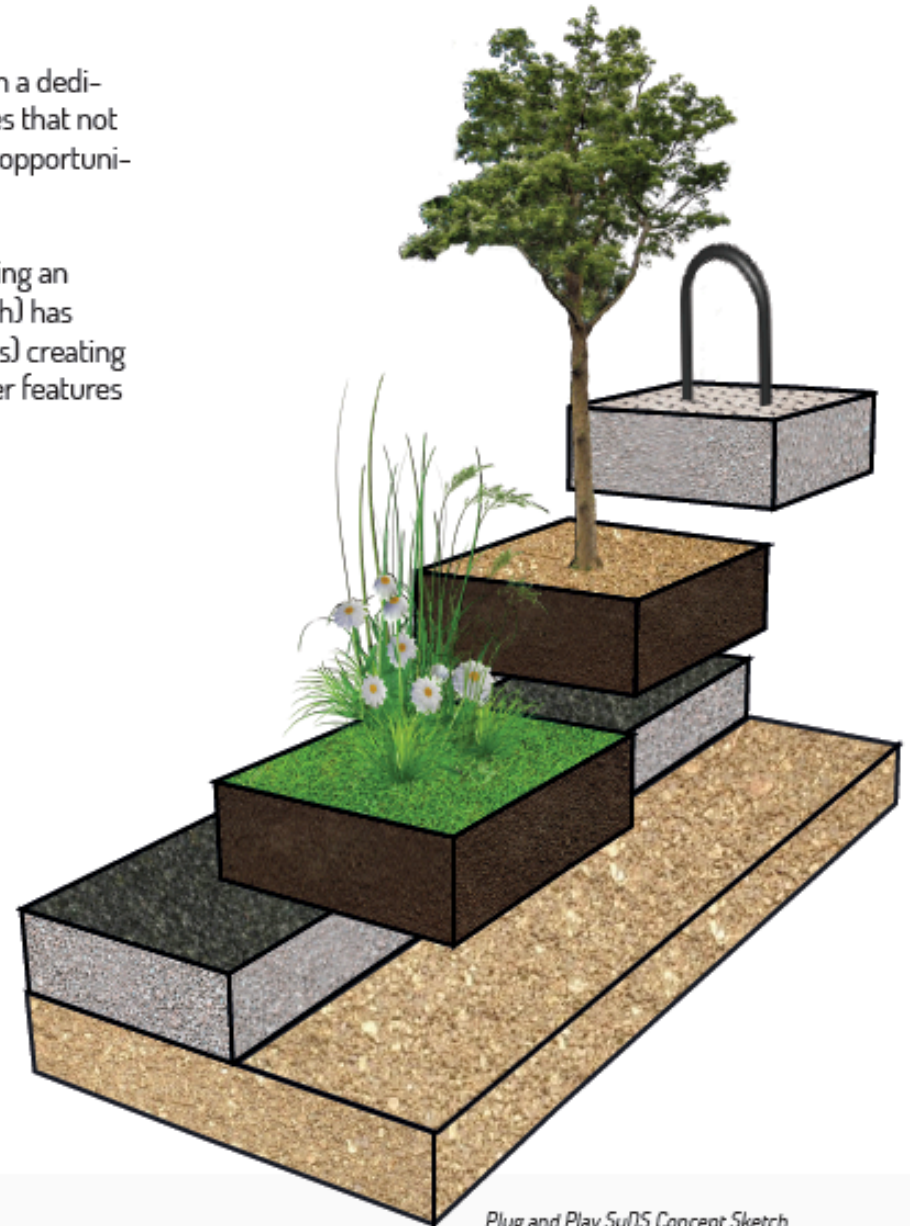
Drainage SuDS Proposal

The renovation of the 3 - 4 lane wide one way Sauchiehall Street to a 2 lane street with a dedicated cycle way and new street stress provides the opportunity to provide SuDS features that not only supports the growth of the new trees, further amenity to the street and provides opportunities to provide attenuation and water quality improvements to storm water.

As the improvements are essentially linear additions to the entire street the idea of using an interpretation of the Stockholm Method as a continual linear SuDS feature (Tree Trench) has been developed along the full extent of the verge and cycleway (see indicative sections) creating a base that can be used to 'plug in' different features such as; Trees, Raingardens, Water features and Permeable paving.



Bus Stop with Green Roof, taken from Draft SuDS and Street Scape Guidance



Plug and Play SuDS Concept Sketch

Below Ground Considerations

Stockholm Method Tree Trench

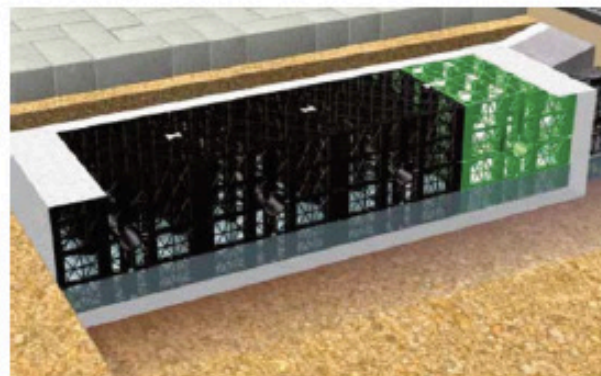
The Stockholm Method for tree planting uses angular rock to bear the load of the pavement profile and vehicular traffic above. The crushed rock should be graded between 100 and 150 mm sizes and can consist recycled materials such as bricks. The void space between the rock is filled with soil, by washing into the voids. The soil does not need to be compacted to support loads. This non-compacted soil and remaining void space between the crushed rock is available for use by trees as both a growing medium and space for gaseous exchange to and as storage space for storm water.



Pictures of a Stockholm Method Tree Trench Being Installed, Taken from Plannting Beds In The City of Stockholm A Handbook 23.02.09 GH100322

Geocellular Systems (Alternative System)

An alternative to the Stockholm Method would be to use proprietary attenuation crate systems, such as Wavin's AquaCell or specific tree pit crates such as Citygree's StrataCell system. That would replace the angular rock that has been described above for use in the Stockholm Method.



Wavin AquaCell crate system laid under a footpath.

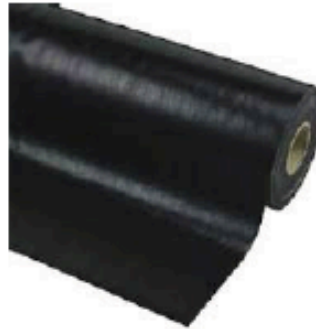


Green Blue Urban Strata Cell System

Below Ground Considerations

Geomembrane

The tree trench will be wrapped in a Geomembrane to provide an impermeable layer, preventing the collected surface water entering the local strata. The level of water retention of the membrane will be of a suitable grade and strength to ensure suitable water retention levels and puncture resistance.



Visqueen Urban Drainage Geomembrane (UDG)



CPM-Group Pre Cast Concrete Chamber Rings/Soakaways



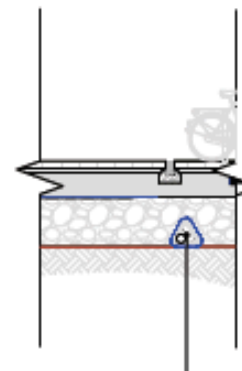
Outfalls

Within the Tree Trench Surface Water would be collected by a perforated manhole chambers, provided at regular centres (circa 50m), where the water would be discharged to the combined sewer via existing connections present from the existing highways gullies.

Utilities

The main threat to delivering a large linear SuDs Feature on Sauchiehall Street will be the relationship with the existing utilities. The current proposal indicated that the Tree Trench will be located within the existing Carriageway and as such all utilities found within the tree trench area should have a minimum of 600 mm cover.

This should cause the majority of the services encountered to be easily protected within the Tree Trench by wrapping within a geotextile and granular material. It should be noted that some providers may need additional protection such as concrete capping. The Tree is a fairly resilient feature which will allow for the retro fit of additional Utilities, providing correct working practices are adopted.



Existing Services being installed within a Tree Trench in Stockholm Sweden

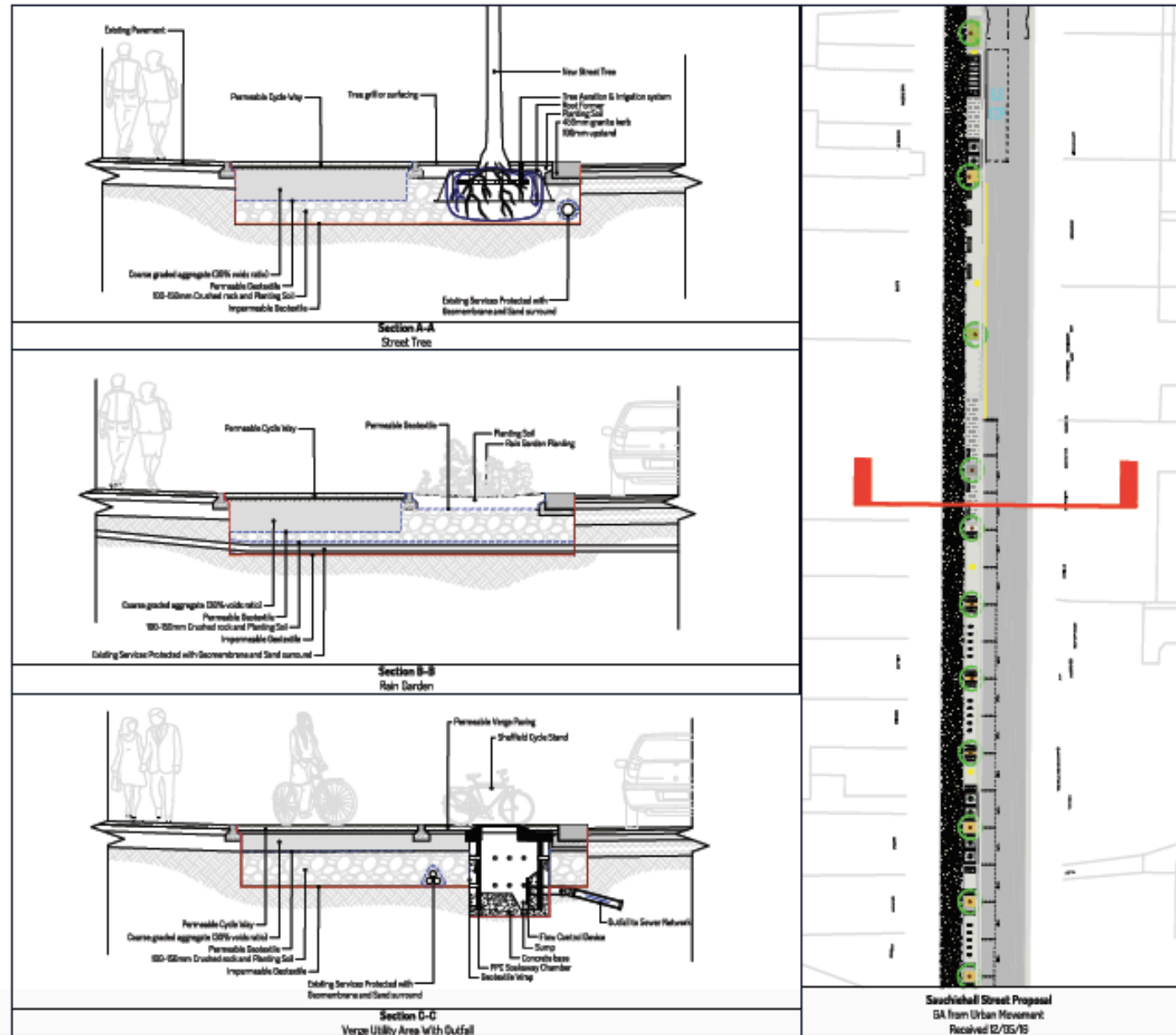
Indicative SuDs Sections

Sections

The indicative sections shown on this page have been developed to give a flavour of how the 3 main SuDS features:

- Trees (A-A)
- Rain Gardens (B-B)
- Permeable Paving (C-C)

Can be incorporated within the existing street scape using the Tree Trench system.





Resilient



Bridget Joyce Square

Australia Road **W12**

London Borough of Hammersmith and Fulham



Resilient





Resilient





Resilient





Resilient





Resilient





Resilient





Creative

Creative

[kree-ey-tiv]

adjective

1. relating to or involving the use of the imagination or original ideas to create something.
2. resulting from originality of thought, expression, etc.



Creative





Creative





Creative





Creative



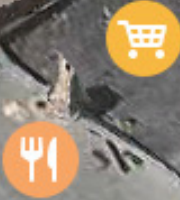


Creative





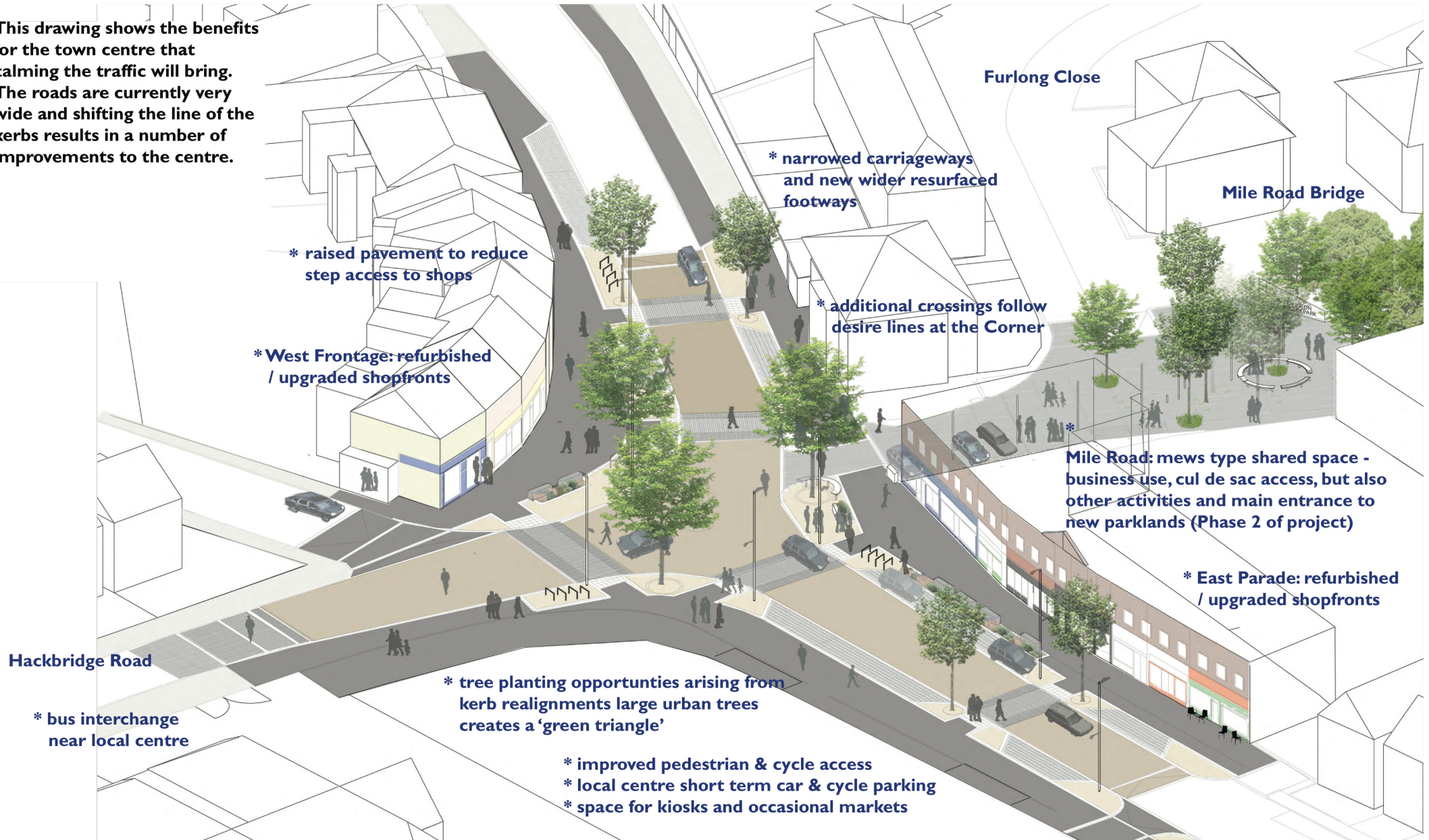
Improving the Local Centre



237 London Rd

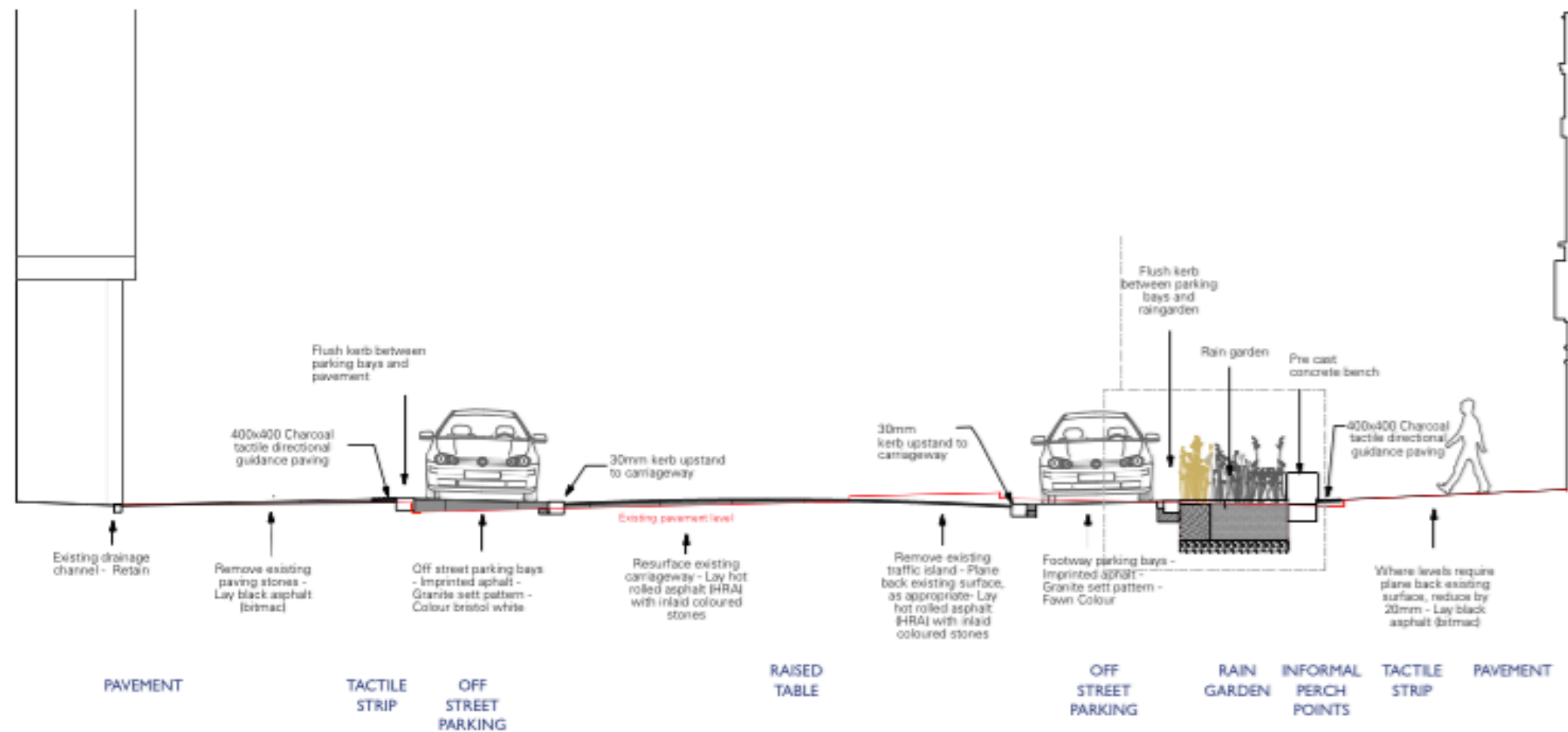
6. Proposals

This drawing shows the benefits for the town centre that calming the traffic will bring. The roads are currently very wide and shifting the line of the kerbs results in a number of improvements to the centre.



SECTION THROUGH SCHEME

Section through the scheme illustrating the raised table, off street parking, informal perch points, and the location of the tactile strip in relation to the pavements.





| | | | |
|----------------------|--------------------------------------------------------------------|--------------|--------------------------------------|
| Report to: | Heart of Hackbridge Delivery Board | Date: | 26 th November 2014 |
| Report title: | Results of Automatic Speed Survey in Heart of Hackbridge | | |
| Report from: | Brendon Hills – Executive Head of Commissioning, Sutton Council | | |

Introduction

Following the implementation of the scheme, a post-scheme survey was carried out in such scheme areas in November 2014. No survey was carried out in the remaining areas.

Regrettably, the survey did not appear to have been carried out in most of the areas. It is recommended that a further survey be carried out in the remaining areas which showed a high level of speeding (e.g. 4000 or more vehicles per day).

The survey was carried out in the centre of Hackbridge but not being recorded as exiting the area (both indicators of damaged wires) have been excluded. Were the questionable data to be included then this would not have changed the finding of this report or the recommendations.

Survey findings

The survey has found that average speed of vehicles on the arms of the Hackbridge scheme are below 24mph. This finding would not have changed this finding raising the average of 19mph to 23mph). On the approach to the scheme (this is usual for

- 13mph for vehicles approaching from the north
- 16mph from the south
- 18mph from the western approach.

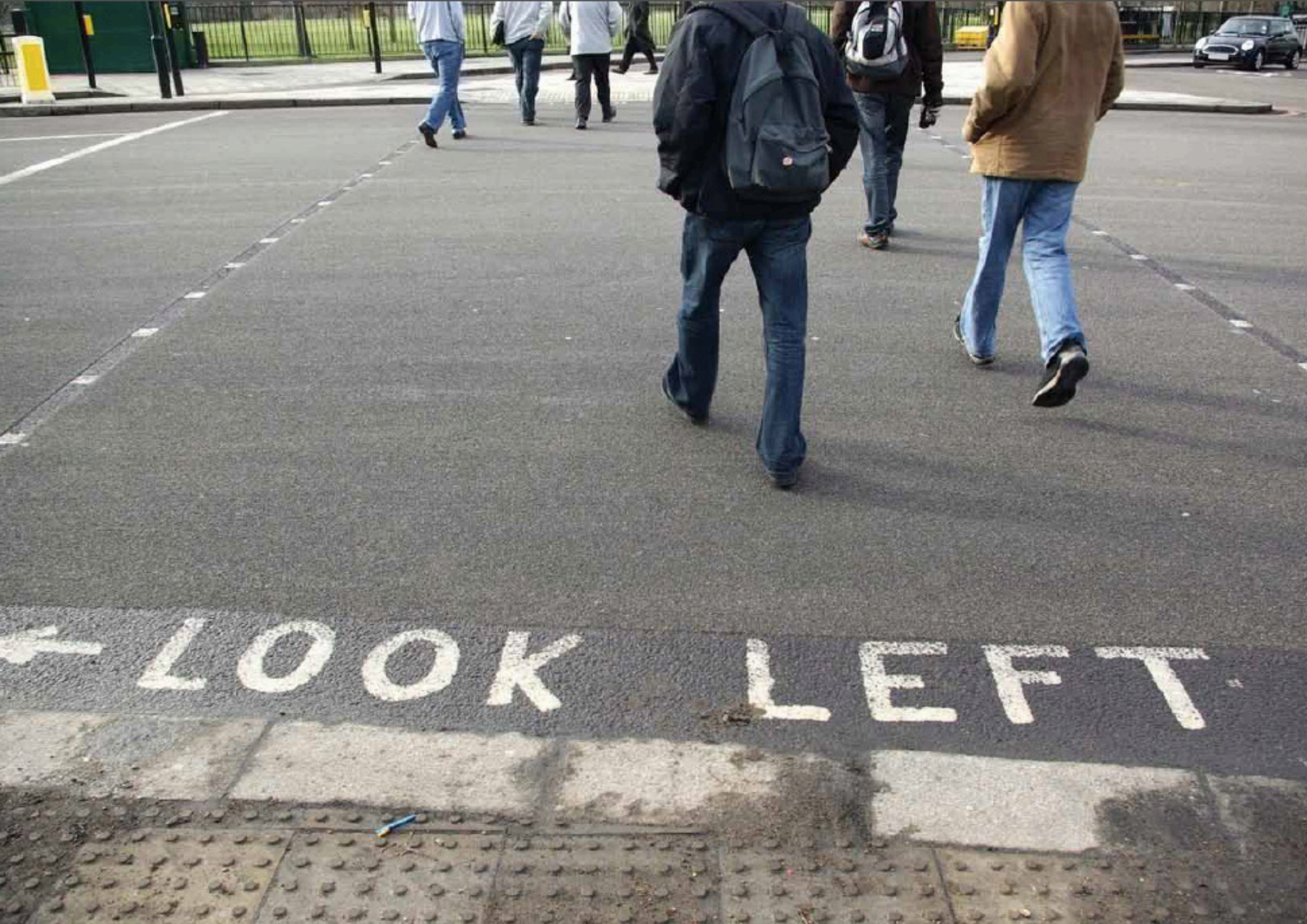
The average exiting speeds were

- 16mph towards the north and
- 19mph towards the south and
- 19mph towards the west

London Fund
This is usual for
11th November

ed and others
time needed to
ations of speed
gements and
as questionable
example, days
vehicles a day
es entering the

← LOOK LEFT





Poetry in Urban Infrastructure

- Proximity
- Intuitive
- Resilient
- Creative

