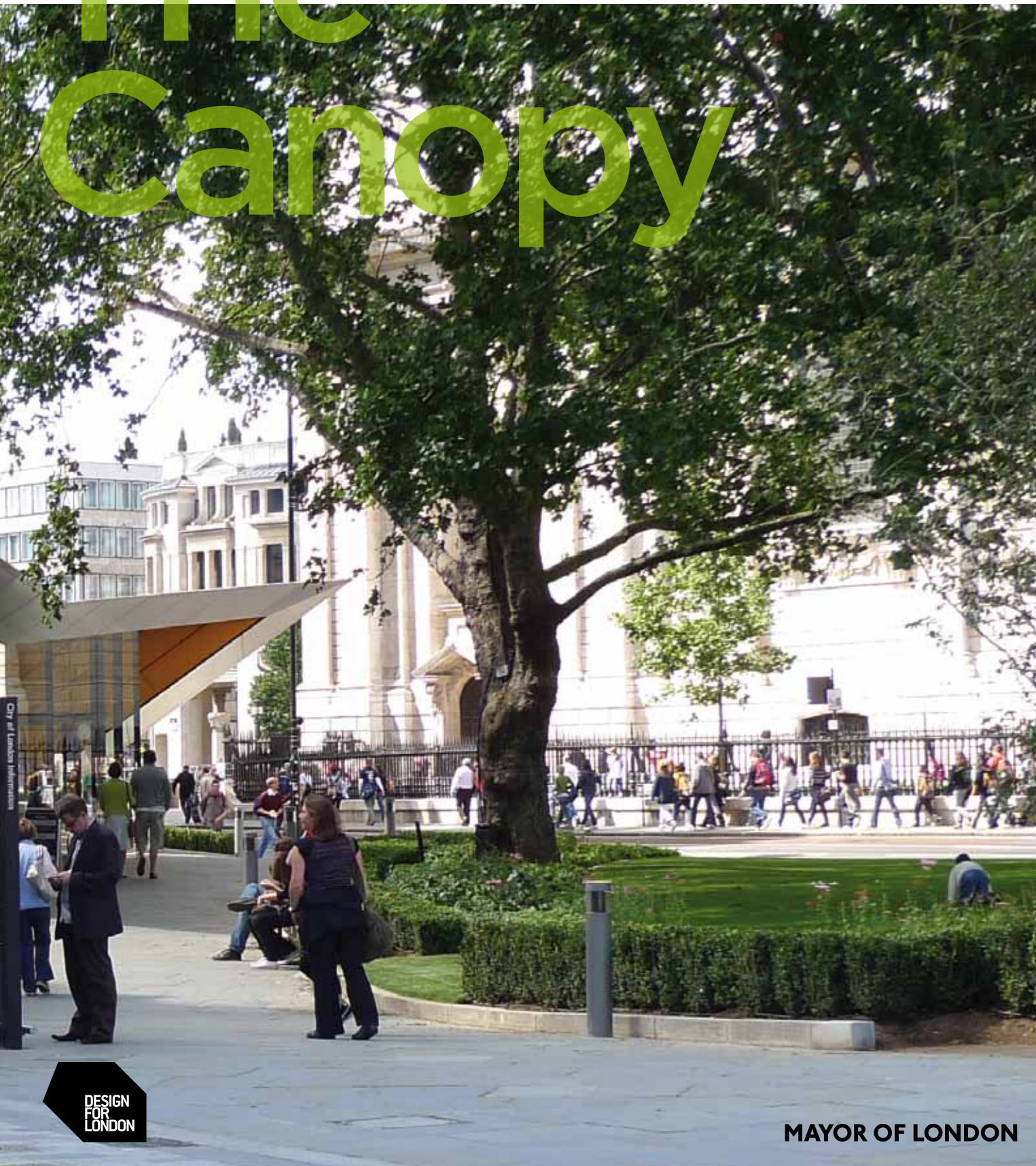


London's Urban Forest:  
A Guide for Designers, Planners and Developers



February 2011

# The Canopy



MAYOR OF LONDON

London is one of the greenest cities in the world – viewed from the air, more than half of the area is lush green space or water. This is a wonderful and precious asset that I am determined we protect to improve quality of life.

Expanding tree cover is a vital part of my vision to create a safer, stronger, greener and cleaner London. Through my RE:Leaf London campaign I aim to increase London's tree cover by 5% by 2025. This will provide a myriad of benefits helping to cool the city, provide shading, sweeten the air by reducing air pollution and generally add to a more pleasing, attractive urban aesthetic.

In addition to taking steps to increase the numbers of new trees being planted, we must also ensure that we reverse the decline of existing mature trees that has occurred over recent years and seek opportunities to encourage a growth in their numbers.

This is a comprehensive and invaluable guide to how we can work together to achieve this.

**Boris Johnson, Mayor of London**



02	The Challenge
04	City Pressures
06	Green Benefits
08	Real Value
10	Technical Solutions
12	Podium Planting
14	Grounded People
16	Case Study: Developer Approach
18	Case Study: Designer Approach
20	Case Study: Planning Approach
22	Knowledge Tree
24	The Future



Our towns and cities are under pressure. Environmental, social and economic demands are making it difficult for us to create healthy, liveable and economically resilient places.

As we strive to improve our urban environments and tackle city pressures, we are discovering the extent to which trees are a significant contributory factor in achieving these aims.

In the last few years a growing body of research has made it clear that trees are a cost-effective way of bringing a wide range of benefits to the environment, to individual people and to society as a whole. At the same time, studies have shown that in urban areas all over England our trees are under threat. Large trees are being cut down and are being replaced by much smaller varieties. The wrong type of trees are being planted in the wrong places. We need to reverse this trend. This guide will help you to do that and to create healthier, more liveable and more successful places.

# The Challenge



Trees are facing enormous pressures in the Capital today; in places their very existence is threatened and scope for new planting increasingly constrained. The London Assembly's "Chainsaw Massacre" report highlighted the loss of street trees in London indicating that more large species trees are being cut down than are being replaced.

The value of trees is rarely considered in the cost-benefit analysis of developments. This is unfortunate and surprising, as many trees will outlive these new developments and their owners.

We all have a relationship with the natural environment and recognize that nature and greenery are good for our well-being. As well as our intuitive connection with trees, there are proven benefits that have been identified by professionals.

# City Pressures



**Insurance**

5-10 percent of the trees cut down in London (2008-2009) were removed due to insurance claims.



**Developments**

Some trees may be lost to developments, but our guidance is intended to reduce this loss and assist in finding sites for new trees.



**Neglect**

Most trees planted will out-live us, so invest in their preparation and maintenance and they could repay you and future generations.



**Road Alignment**

Street trees can fall victim to carriageway realignment. When they are replaced, the new trees should be of equal merit and also able to grow to their full size.



**Fear/Ignorance**

Falling branches, subsidence, fruit drop, poisonous seeds and other natural events caused by trees can all be managed if you select the right place for the right tree.



**Climate Change**

Some tree species such as Silver Birch may be less successful in the future. We say broaden the range of trees planted and remember right place, right tree.



**Vandalism**

Trees and especially young trees are prone to vandalism. Good maintenance and adequate tree protection measures are key in reducing vandalism.



**Old Age**

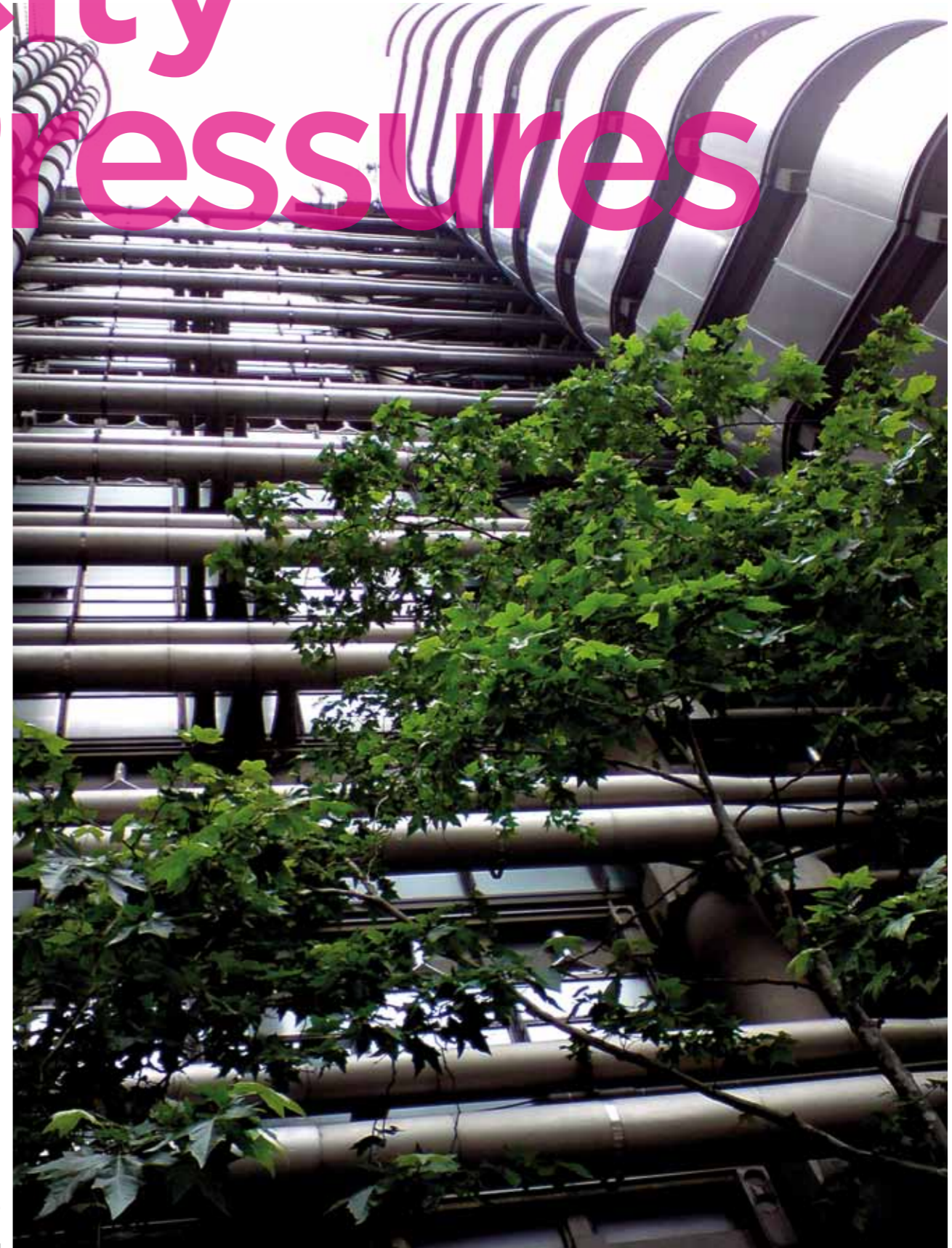
We all get old and trees are no different. However, their life-spans can be extended with good preparation and maintenance during their life time.



“By following best practice and taking advice from arboricultural professionals, we can accommodate larger trees in the public realm.”

**Dana Skelley, Director of Roads, Transport for London**

A London Plane outside the Lloyd's Building



# Green Benefits



**Cooling**  
 Trees provide cooling by shade and evaporation from their leaves; which means that larger canopy species are better. All trees require adequate rooting space and a water source. Direct contact with the earth is preferable.

**Air Quality**  
 Trees can help to filter fine particles from the air.

**Micro Climate**  
 Trees help to reduce extremes of temperature.

**Landscape Screening**  
 Not everything in cities is aesthetically pleasing and in some instances, trees and other vegetation can be of assistance in screening undesirable views.

**Property Value**  
 Tree lined streets have been proven to increase house prices by as much as 15%. Most people choose to live in and/or around trees wherever possible.

**Biodiversity**  
 An increase in tree diversity will benefit a host of insects, birds and mammals in our towns and cities.

**Aesthetic**  
 Most Architects and Planners would agree that trees bring a sense of place and maturity to schemes, whilst larger species trees help to create a more human scale to old and new developments.

**Energy Saving**  
 It has been proven that large trees located alongside buildings can act as a secondary insulating layer, regulating temperatures around buildings. Deciduous trees can also help keep buildings cool in the summer and warmer in the winter.

We appreciate that it is not possible to retain or locate trees in every new development but we hope that good tree solutions will be incorporated wherever possible.

Trees are assets which increase in value over time. It is now possible to quantify these values in monetary terms and apply an economic analysis to the benefits of urban trees including increases in property values, energy conservation, air quality improvement, CO<sub>2</sub> reduction and storm water control. Current research is exploring methods for quantifying the value of trees in terms of additional gains such as human health and well-being and crime reduction.

In reality, trees have to balance with many other considerations that are placed on a project. Whilst the constraints and problems are well known, some of the benefits of trees are less publicised. The following points highlight the broader benefits of trees.



#### Cost Reduction

Trees help improve the environmental performance of buildings – a well planted development can lower heating and cooling costs by 20%.



#### Asset Value Increase

Maximise your investment. Trees have the potential to increase property values by 7% to 15%.



#### Environmental Enhancements

Turn off the air conditioning and turn down the heating. Urban trees help reduce temperature extremes.



#### Social Improvements

Evidence has shown that in some locations areas with high numbers of trees experience less crime. Trees also help to reduce noise pollution, absorbing and deflecting sound.



#### Create a Sense of Place

Trees help to improve local identity. Large species trees equal big improvements. Trees can encourage social activities in areas with higher tree numbers, creating stronger and friendlier communities.



#### Safer Streets

Tree-lined streets promote calmer driving so are safer for pedestrians and thus enhance both walking and cycling.



#### Health and Well-being

Trees improve the urban environment. Trees and urban greening have been shown to reduce stress levels and so increase feelings of well-being.



#### Stabilising Storms

Trees help reduce the effects of flash flooding by intercepting rainfall and can readily absorb water through their fibrous roots.



#### Wildlife Enhancements

Tree planting is a great way of increasing biodiversity. They are a major element in creating urban green links and wildlife corridors, as part of green infrastructure.

# Real Value



#### Environment

*Gill SE, Handley JF, Ennos AR and Pauleit, S (2007)*

Adapting Cities for Climate Change: the Role of the Green Infrastructure. Built Environment 33 (1) pp 115-133



#### Economic

*Anderson LM and Cordel HK (1988)*

Influence of Trees on Residential Property Values in Athens, Georgia: A Survey Based on Actual Sales Prices, Landscape and Urban Planning 15: 153-164

*Morales DJ (1980)*

The Contribution of Trees to Residential Property Value: Journal of Arboriculture 6 (11): 305-308

*CABE Space (2005)*

Does Money Grow on Trees?

Commission for Architecture and the Built Environment, London



#### Social

*National Urban Forestry Unit (1999)*

Trees and Healthy Living, National Conference, Wolverhampton, UK, National Urban Forestry Unit, Wolverhampton

*Mudrak LY (1982)*

In the Environmental Benefits of Vegetation at a Global Local and Personal Level: A Review of the Literature, Green Releaf, Horticultural Trades Association and Royal Botanical Gardens, Kew



#### Health and Well-being

*National Urban Forestry Unit (1999)*

Trees and Healthy Living, National Conference, Wolverhampton, UK, National Urban Forestry Unit, Wolverhampton

*Mudrak LY (1982)*

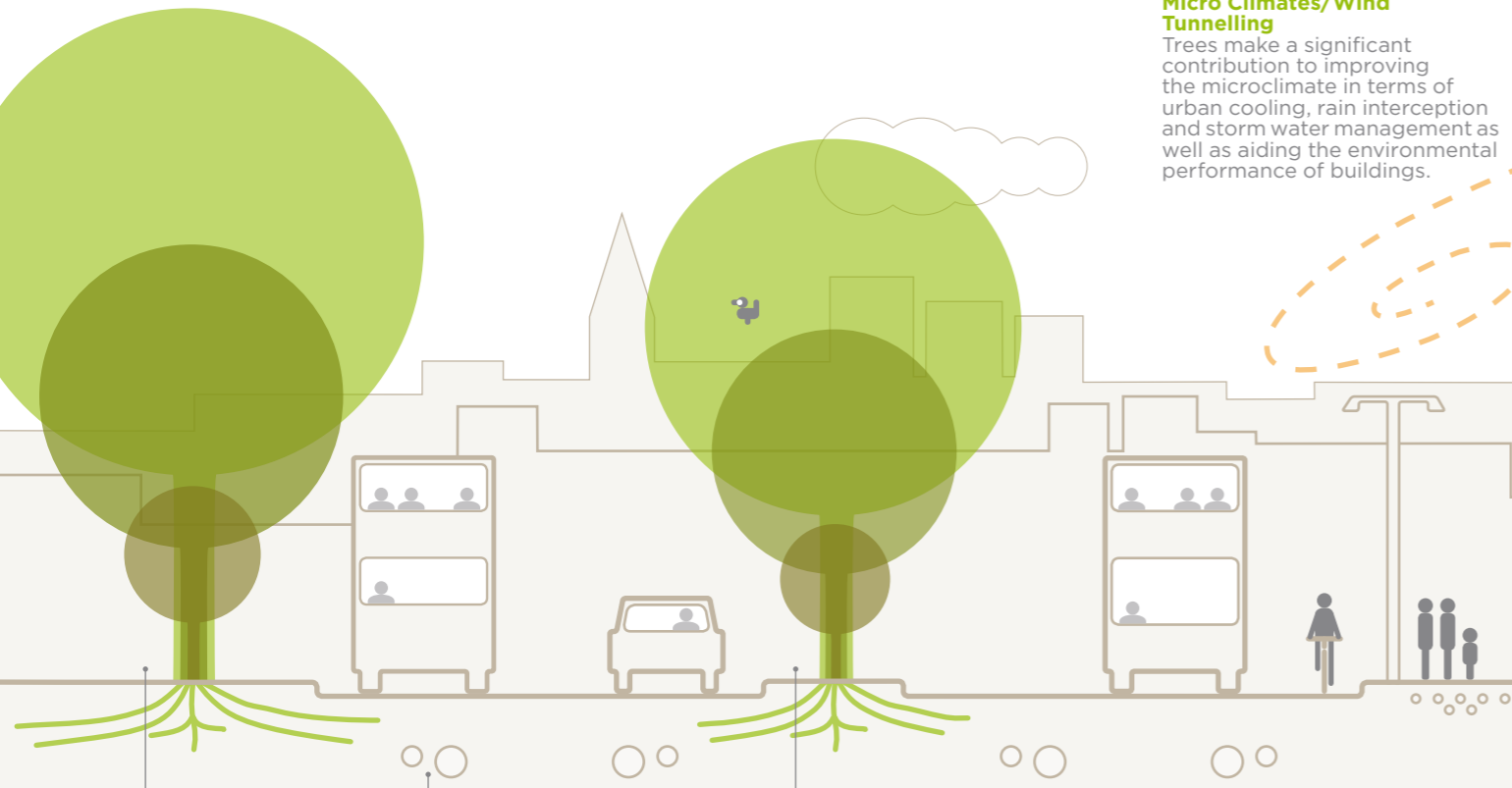
In the Environmental Benefits of Vegetation at a Global Local and Personal Level: A Review of the Literature, Green Releaf, Horticultural Trades Association and Royal Botanical Gardens, Kew



“The insurance industry understands the importance of urban trees. We believe they can play an important role in keeping our cities cool as climate change takes effect and have taken pro-active steps such as advising on safe distances from buildings for new plantings.”

**Swenja Surminski, Association of British Insurers**

# Technical Solutions



**Street Trees**  
Streets present the best opportunity within the urban realm for larger species trees to grow to maturity. Suitable soil volume and root space is required.  
£ £ £ £ £  
● ● ● ● ●  
X X X X X

**Utilities**  
Locating new street trees in London is notoriously difficult. Do not rely on ground radar to find all of the utilities. Wherever possible, dig trial holes to avoid disappointment. Most tree roots grow in the first 600mm depth of soil. Services should be located outside this zone.

**Newly Constructed Central Reservations**  
Footways can be a difficult places to locate street trees due to utilities and other obstacles. Therefore, planting in the central reservation can be an alternative solution for street tree planting.  
£ £ £ £ £  
● ● ● ● ●  
X X X X X

**Structural Landscape**  
These constrained locations should only occur where attempts to plant trees directly into the soil have failed. Maximise the soil depth, propose the right tree for the location, and always seek professional advice from a landscape architect, arboriculturist and a structural engineer.  
£ £ £ £ £  
● ● ● ● ●  
X X X X X

**Micro Climates/Wind Tunnelling**  
Trees make a significant contribution to improving the microclimate in terms of urban cooling, rain interception and storm water management as well as aiding the environmental performance of buildings.

**Roof Gardens**  
Although more complex, trees can be planted on roofs in some locations. Developers and designers must seek advice from an arboriculturist and a structural engineer.  
£ £ £ £ £  
● ● ● ● ●  
X X X X X

**Planters**  
Avoid where possible. Planters need more intensive maintenance and can limit tree growth. As always, right place, right tree.  
£ £ £ £ £  
● ● ● ● ●  
X X X X X



**Key**  
£ £ £ £ £ Expense of installation  
● ● ● ● ● Benefit  
X X X X X Maintenance

**Time in Years**  
30  
20  
10

Developers and designers should always seek advice from an arboriculturist, highways and structural engineers.

In many situations planting trees above structures is the only way to include trees in new developments. The larger growing species offer the greatest benefits for the future of our cities and it is hoped that trees in structured landscapes can be retained to grow to maturity through adequate provisions at an early stage in the development process.



#### Build a Green Structural Team

Involve engineers, architects, landscape architects, arboriculturists and other specialist consultants in an integrated, joined up approach.

#### Grow the Team Together

Early involvement of all consultants is needed to ensure that the technical requirements are fully and adequately integrated - e.g. slab design, drainage, and irrigation systems.

#### Know Your Trees and Substrate

Ensure adequate soil volumes for the selected species so they can grow to maturity. This will require that sufficient soil preparation is undertaken.

#### Right Place, Right Tree

Identify appropriate size of trees for planting to promote longevity.

#### Irrigation Maintenance Plan

Include sustainable water management systems.

#### Design and Manage Growth

Access for regular maintenance operations needs to be provided.

#### Invest in Green Futures

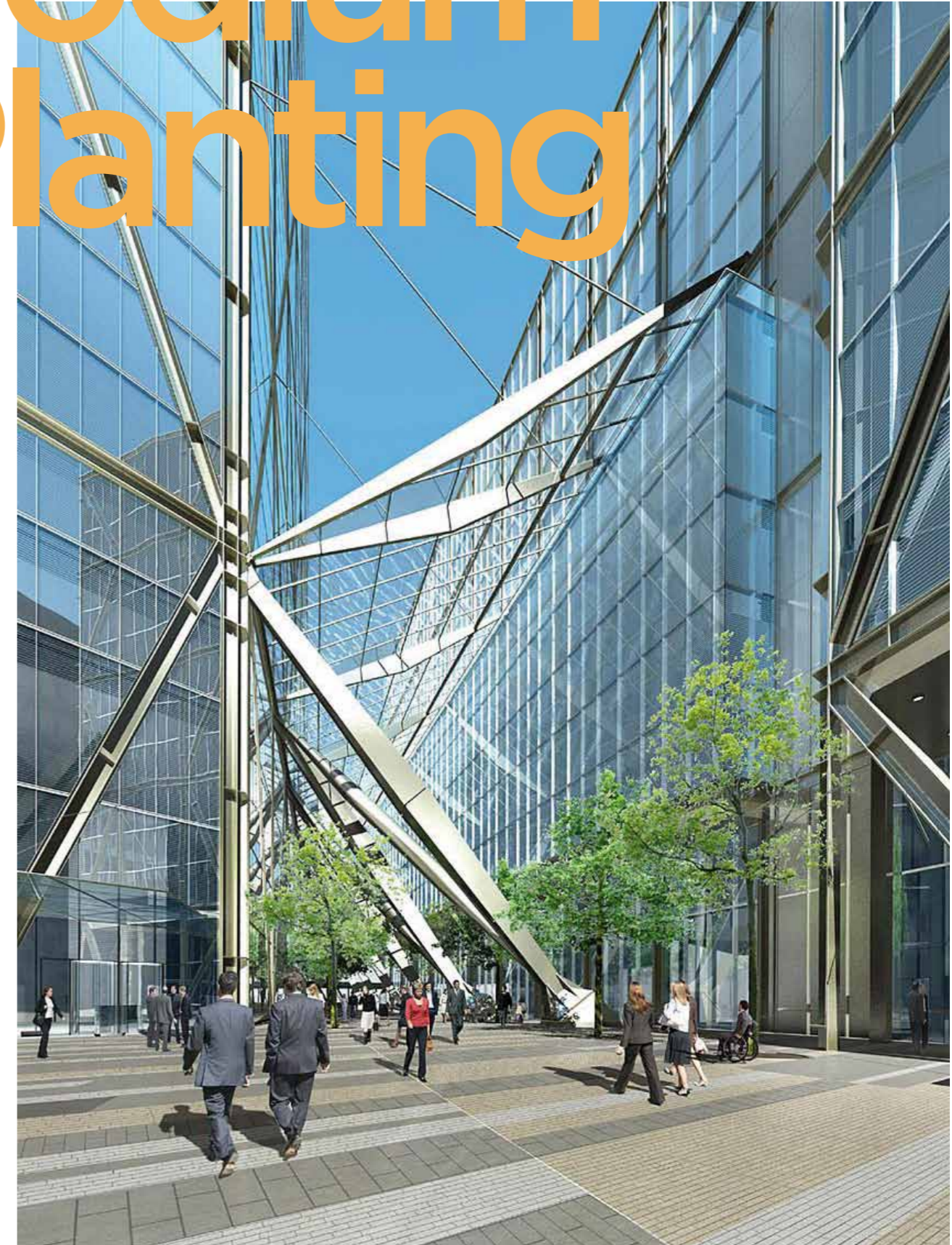
Prepare management plan and costs for long term tree care, allowing for the removal and replacement of failed trees.



“With good planning and design, large trees can assist with the energy efficiency of individual buildings and benefit local areas in our towns and cities by improving local temperatures, wind conditions, and providing water storage.”

**Sarah Cary, Sustainable developments executive, British Land**

# Podium Planting







“Trees improve the street environment in which Londoners live and work so I will do all I can to save the trees we have and campaign for more trees to protect London’s open spaces.”

**Boris Johnson, Mayor of London**



“Trees are an essential part of the urban public realm, both practically and aesthetically. They bring many things including focus, shade, calm or simply a view on the changing seasons.”

**Robert Noel, Managing Director, London Portfolio, Land Securities**



“In any civilised society access to high-quality public space should be a fundamental human right. Everyone should be able to see a tree from their window, sit on a bench, walk to a square and cycle to a park.”

**Lord Rogers of Riverside, Rogers Stirk Harbour Partnership**



“Trees make a difference to the way we all respond to a particular place and help to create a much needed sense of identity.”

**Ann Skippers, President RTPI 2010**

# Grounded People



## St Andrews, Bromley-by-Bow Developer Approach (Building for Life 2010 award winner)

St Andrews is a landmark regeneration scheme being delivered in partnership by Barratt Homes, the London Development Agency, the Homes and Communities Agency and Circle Anglia.

The development, currently under construction, will bring 964 high-quality new homes, a brand new NHS health care facility, one hectare of gardens and parks and a new community facility.

“It is crucial for our residents that we provide a pleasant environment for people to live and play and we value the contribution that well-designed open space and greenery can bring in enhancing the quality of our developments.

When completed, the St Andrews development will be a fantastic amenity for the entire local community, providing safe and accessible green space which is a welcome counterbalance to the nearby A12.”

Alastair Baird, Regional Managing Director of Barratt London

**Official Title**  
St Andrews,  
Bromley-by-Bow

**Location**  
Bromley-by-Bow,  
Tower Hamlets

**Owners**  
Barratt Homes

**Designed by**  
Masterplanned by  
Allies and Morrison.  
Phases 1, 4 and 5 designed  
by Allies and Morrison.  
Phase 2 designed by  
Maccreanor Lavington.  
Phase 3 designed by  
Glenn Howells

**Development Stage**  
Under construction



Nexus, Phase 1



Site layout

# Case Study



Union, Block B

## Maggie's Centre Designer Approach

Rogers Stirk Harbour + Partners and the Dan Pearson Studio completed the Maggie's Cancer Caring Centre in Hammersmith 2008. The building did not impact on a nearby London Plane tree and additional trees/plants were planted creating a comfortable, uplifting space for visitors.

“Maggie's London is on a very busy corner of the Fulham Palace Road, with one of the only remarkable features being the line of mature London plane trees that form the perimeter boundary of Charing Cross Hospital. The interaction between the building and its surroundings was integral to the design, with views both into and out of the building being carefully managed with the help of courtyard gardens and external landscape. Over 80 new trees now envelop the building to shelter it from the noise and pollution of the busy main road with the positioning of the building being greatly influenced by the line of existing trees. The entrance pathway winding through the existing plane trees instigates a transition between the main hospital and the non-institutional environment of Maggie's.”

Will Wimshurst, Project Architect,  
Rogers Stirk Harbour + Partners

**Official Title**  
Maggie's Cancer Caring  
Centre

**Location**  
Charing Cross Hospital,  
Hammersmith

**Owners**  
London Borough of  
Hammersmith PCT

**Designed by**  
Rogers Stirk Harbour  
+ Partners

**Development Stage**  
Completed 2009 and  
awarded the RIBA Stirling  
Prize and other awards

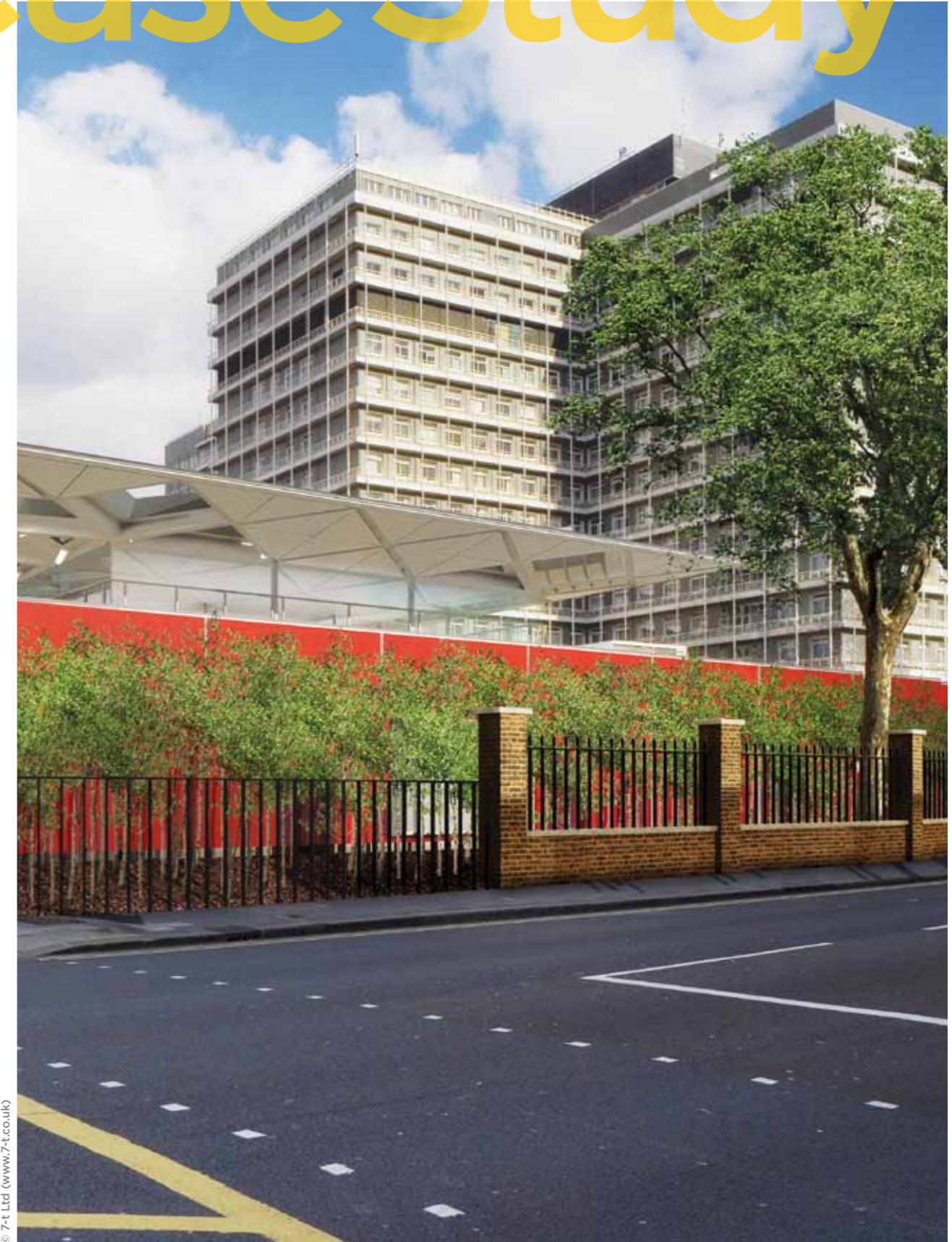


© Lorraine Worpole



© Lorraine Worpole

# Case Study



© 7-t Ltd (www.7-t.co.uk)

## Bankside Urban Forest Planning Approach

Bankside Urban Forest highlights the importance of partnership working across public/private and third sectors to maximise the effective utilisation of investment. The key stakeholders include: Better Bankside, Southwark Council, Tate Modern, Design for London, Cross River Partnership, The Architecture Foundation, Bankside Residents' Forum, Bankside Open Spaces Trust, Native Land and Land Securities.

Bankside Urban Forest is about making Bankside a better place to live, work and visit. It is a strategy for enhancing public spaces - including streets, pavements, squares and parks - in the Bankside area:

- It encourages investment in public spaces.
- It encourages imaginative and high-quality improvements.
- It also helps to coordinate individual projects with an overall vision. Too often public space projects fail to join up with each other, creating confusing and chaotic places.

A forest is a place with a strong overall character, which allows diverse activities, freedoms and places within it. The aim of the Bankside Urban Forest is to achieve this quality in a city context. The strategy is not literally to turn the area into a forest, although it does create opportunities for greening, using trees, planted walls, and other means.

**Official Title**  
Bankside Urban Forest

**Location**  
Bankside Southwark

**Owners**  
Partnership of above organisations coordinated by Better Bankside

**Designed by**  
Witherford Watson Mann

**Development Stage**  
Ongoing

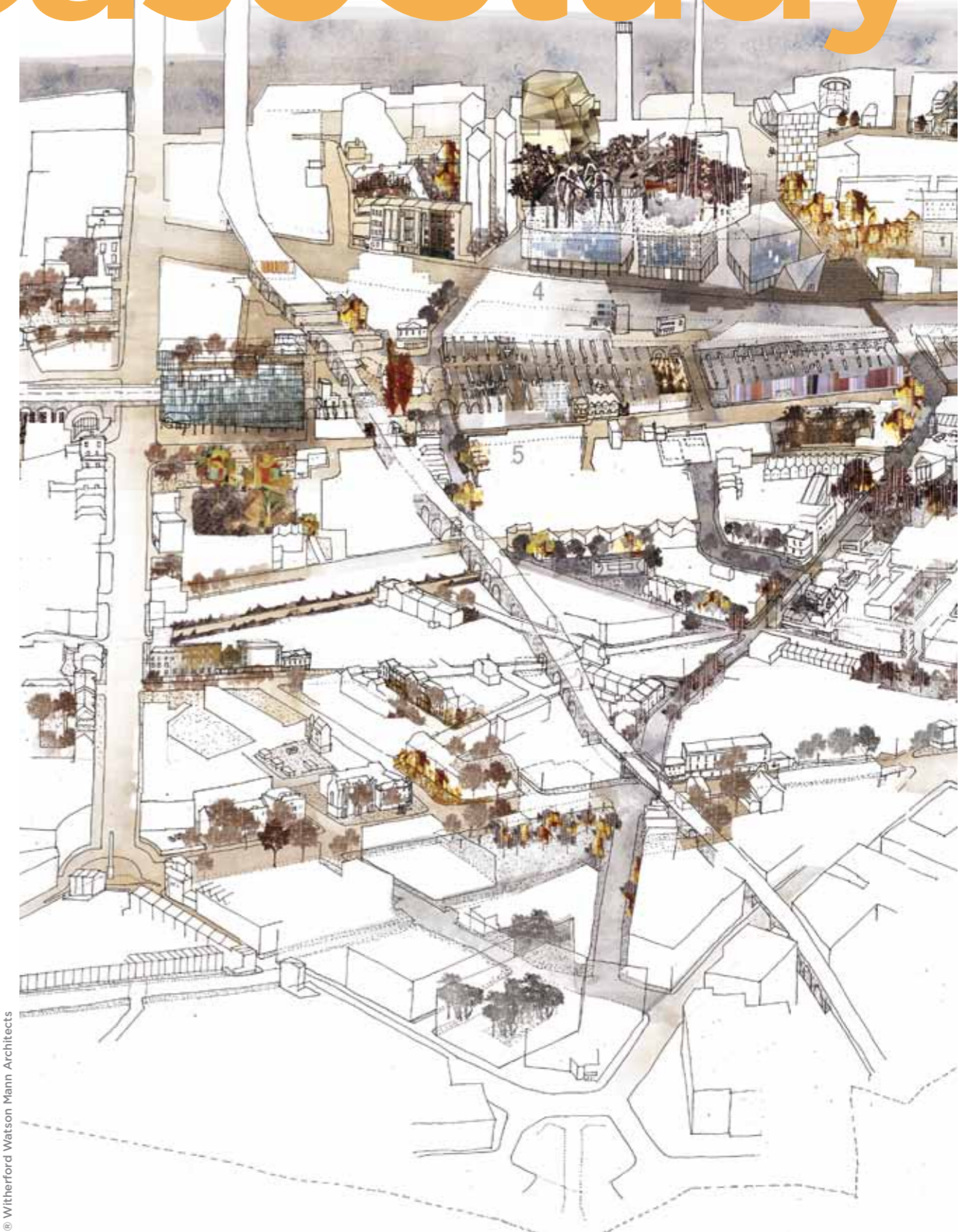


© Mickey Lee, Media Mixer



© Witherford Watson Mann Architects

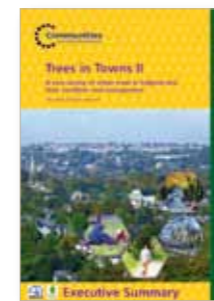
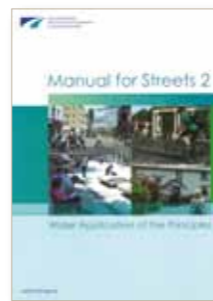
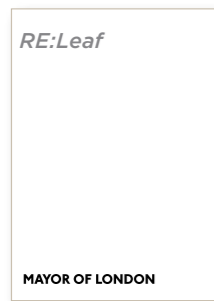
# Case Study



© Witherford Watson Mann Architects

This page shows some key documents relating to trees and their implementation in the urban realm. Whilst funding and stakeholders may change over time, the principles for good tree planting are constant and are based on the “right place, right tree” approach and following best practice planting and maintenance guidance as well as seeking advice from experts where relevant.

# Knowledge Tree



## Promotion and Funding

*RE:Leaf*  
(GLA 2011)  
[www.london.gov.uk/releaf-london](http://www.london.gov.uk/releaf-london)

*The Big Tree Plant*  
(DEFRA & The Forestry Commission 2010)  
[www.defra.gov.uk/news/2010/12/02/tree-plant](http://www.defra.gov.uk/news/2010/12/02/tree-plant)

**London Policy**  
*The London Plan*

*A Tree and Woodland Framework for London*

## Technical Guidance

*Department for Transport: Manual for Streets I and II*

*CLG: Tree Roots in the Built Environment*

*Guidelines for the Planning, Installation & Maintenance of Utility Apparatus in Proximity to Trees (V4) NJUG*  
[www.njug.org.uk/publication/51](http://www.njug.org.uk/publication/51)

*Joint Mitigation Protocol LTOA (2008)*  
*London Tree Officers Association*  
[www.ltoa.org.uk](http://www.ltoa.org.uk)

## Other Guidance

*CLG: Trees in Towns II*

*Mayor of London: London's Great Outdoors - Better Streets; Better Green & Water space*

*CABE: From Grey to Green Campaign*  
[www.cabe.org.uk/grey-to-green](http://www.cabe.org.uk/grey-to-green)

*CABE: Sustainable Cities*  
[www.cabe.org.uk/sustainable-cities](http://www.cabe.org.uk/sustainable-cities)

*Natural England: A Natural Development*  
[www.naturalengland.org.uk/naturaldevelopment](http://www.naturalengland.org.uk/naturaldevelopment)

# The Future

The Trees & Design Action Group (TDAG) is a pioneering group of individuals, professionals and organisations from both the public and the private sectors who have come together to increase awareness of the role of trees in the built environment throughout the United Kingdom.

The Group shares the collective vision that the location of trees, and all the benefits they bring, can be secured for future generations by influencing the planning, design, construction and management of our urban infrastructure and spaces.

TDAG assists developers, designers and planners in addressing trees issues by seeking to influence policy and pooling existing best practice into one navigable point.

More information about TDAG can be found on [www.tdag.org.uk](http://www.tdag.org.uk)

## Organisations and individuals who have contributed to the TDAG include:

4D Landscape Design  
Arboricultural Association  
Arup  
Atkins Global  
Barcham Trees  
Barrell Tree Care  
Bennetts Associates  
Blackwood Murray Architects  
Brady Mallalieu Architects  
Bristol Street Trees  
Building Research Establishment (BRE)  
CABE  
Canary Wharf Group  
Capita Symonds  
CgMS Planning Consultants  
CIRIA  
City of London  
City of Westminster  
Civic Trees  
Design for London  
English Heritage  
Environment Agency  
Farrells  
Forestry Commission  
Gardiner & Theobald  
Geosynthetics Ltd  
Glendale Managed Services  
Greater London Authority  
Green Roof Consultancy  
Greening the Gateway Kent & Medway  
Grosvenor  
GVA Grimley  
Hi-Line Consultancy  
ICE (Institution of Civil Engineers)  
ICF (Institute of Chartered Foresters)

ISA (UK & I Chapter)  
Land Securities  
Landscape Institute  
Leeds Metropolitan University  
London Borough of Hackney  
London Borough of Wandsworth  
London Parks & Green Spaces Forum  
London Tree Officers Association  
Marishal Thompson  
Mouchel  
Myerscough College  
National Association of Tree Officers  
National and London Joint Utilities Groups  
Natural England  
NUAG  
Peter Osborne, Independent Insurer  
Places for People  
RSA Group (formerly Royal and Sun)  
TCPA (Town and Country Planning Association)  
Thames Water  
The Royal Parks  
The Tree Council  
The Woodland Trust  
Torbay City Council  
Transport for London  
Tree and Landscape Evaluation Systems  
Trees for Cities  
Treework Environmental Practice  
University of Essex  
University of Manchester  
Urban Design London  
Victoria BID  
Willerby Landscapes  
Zurich Municipal

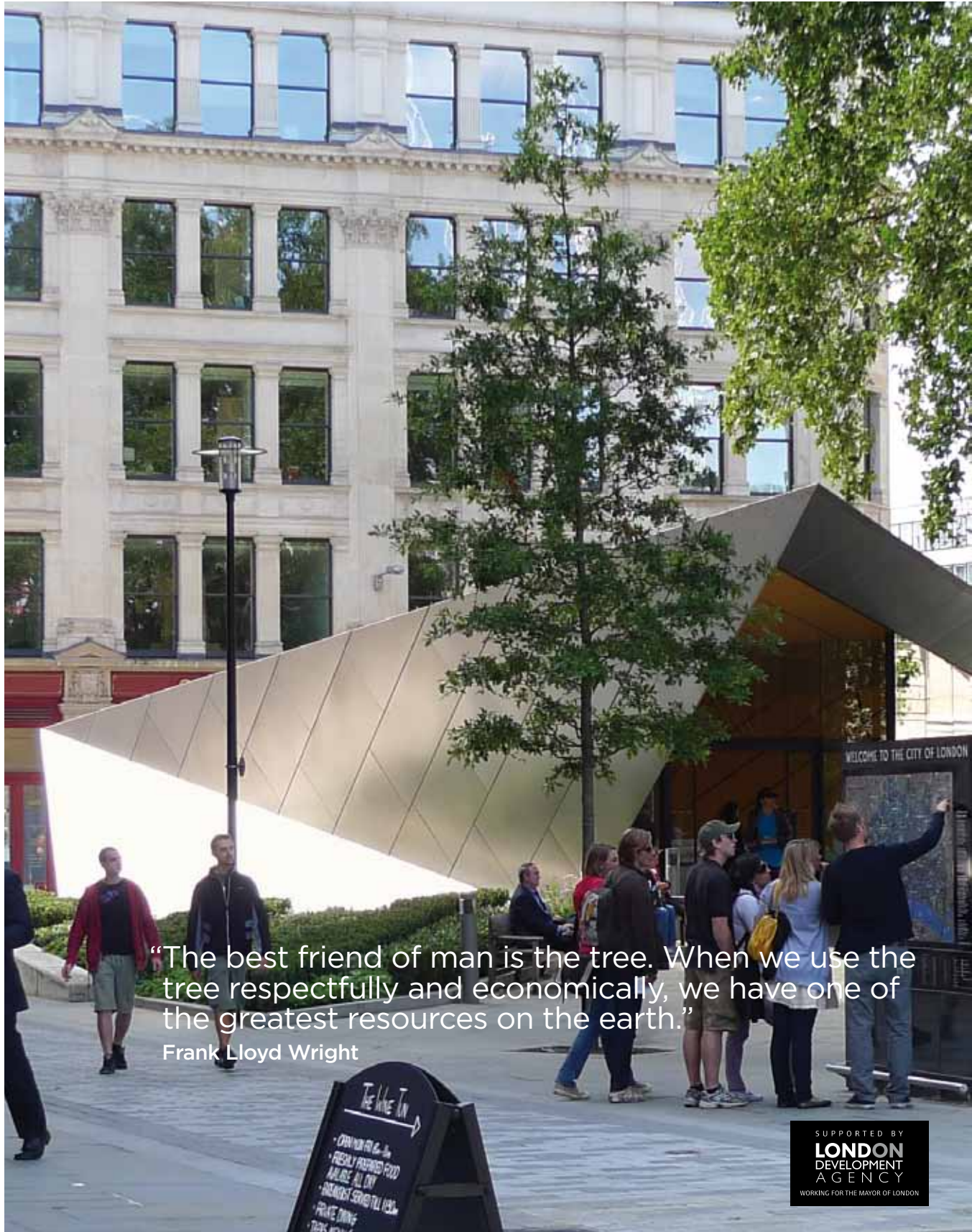
... and growing!

## The Canopy was written and produced by:

Paul Campbell  
Design for London

Sue James  
Capita Symonds

Chris Edwards  
CABE



“The best friend of man is the tree. When we use the tree respectfully and economically, we have one of the greatest resources on the earth.”

Frank Lloyd Wright