The case for trees

in development and the urban environment

Forestry Commission
England
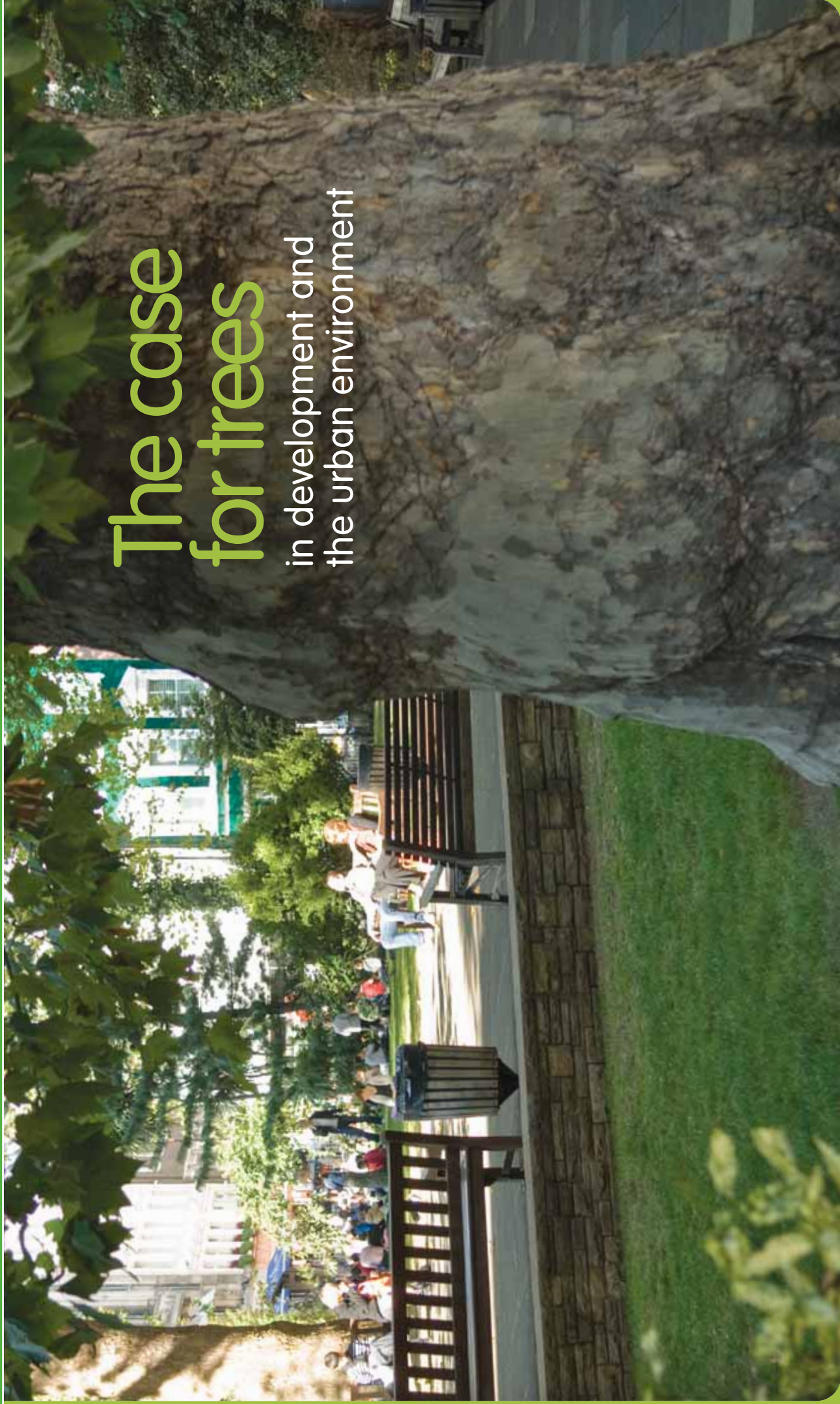
Foreword

Trees are important to people – the overriding response from a recent public consultation we conducted as to what the public wanted from the Forestry Commission was simply, 'Plant more trees!' Trees are important to politicians too. Most recent party manifestos have contained pledges about protecting and increasing tree and woodland cover. Pledges that have been translated into action, as in the Government's commitment, 'to launch a national tree planting campaign'.

That might sound like it should consist only of large areas of new woodland set out in the countryside, or perhaps on restored 'brownfield' land. There is no doubt that we need to encourage increased planting across the country – to help meet carbon targets – and every tree can count towards those targets as part of a renewed national effort to increase the country's overall woodland canopy.

But it's not all about carbon; there is a growing realisation among academics about the important role trees play in our urban as well as the rural environment. It has long been accepted and confirmed by numerous studies that trees absorb pollutants in our cities with measurable benefits to people's health – such as reducing asthma levels. Yet trees also deliver a whole host of other extraordinary economic, environmental and social benefits. Studies show that where industrial areas and work places include trees, employees are more productive and have a greater sense of job satisfaction! And trees increase economic as well as personal wellbeing, with property values boosted by their presence.

For all their myriad benefits, trees are not always valued. Too often, they are seen as additional, rather than fundamental to good development. Generally unfounded fears over safety or through root disturbance to foundations have seen their removal rather than integration into development.

This report, bringing together a rich resource of research and practical examples, seeks to persuade everyone involved in planning policy and practice to think positively about trees – and to become their champions and advocates. I also hope that it inspires many mre people and organisations to have a say and get involved in planning their local and – hopefully – green environment. The development of the space in which we live and work represents an opportunity for change that may not be repeated for many years. Making the right decisions at these pivotal moments can influence peoples' sense of place, health and wellbeing for generations.

Naturally, I commend this summary case for trees to you.

Pamela Warhurst, CBE,
Chair Executive Board, July 2010

Where would you want to live?
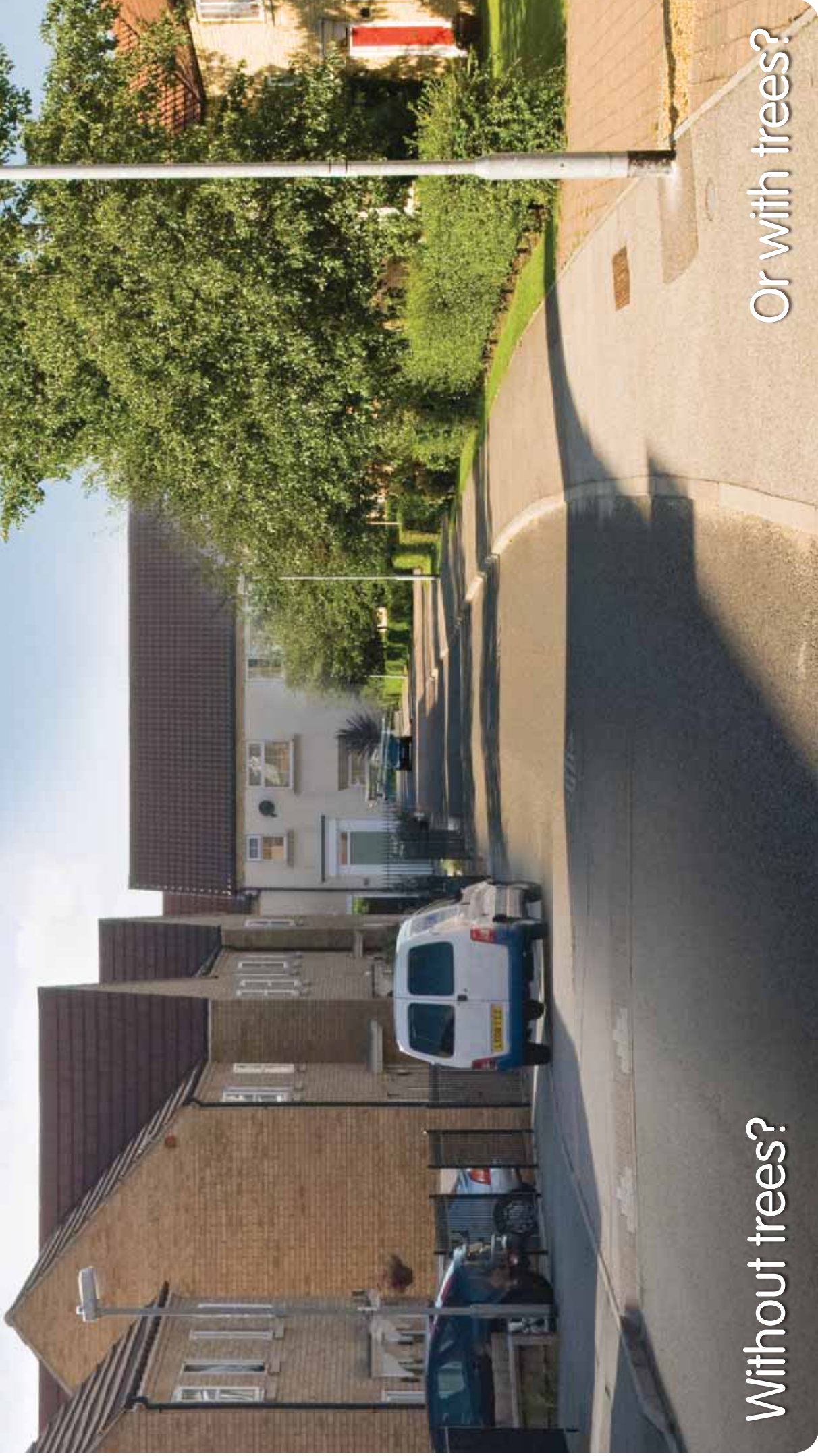
Without trees?

Or with trees?

The case for trees is clear

Trees transform our built environment

Trees dramatically improve appearances

But their value is considerably more than their environmental contribution. They help combat climate change. They can deliver an economic dividend. Further they provide numerous social benefits.

This brochure demonstrates the many ways in which trees contribute to every street and development.

Social

Economic

Environment

Climate change

The multiple value of trees for people and places

TREES INCREASE RESILIENCE TO CLIMATE CHANGE

Countering climate change[1]

Trees naturally absorb CO_2, a key greenhouse gas, through the process of photosynthesis. Thus trees help to create a significant carbon sink, sequestering carbon to benefit everyone through a natural process.

The UK's forests and woodlands contain around 150 million tonnes of carbon and act as an on-going carbon sink by removing a further 4 million tonnes of it from the atmosphere every year[2]. For the UK it has been calculated that a 33% increase in woodland cover would deliver an emissions abatement equivalent to 10% of greenhouse gas emissions by the 2050's.

The adoption of low-carbon options[3], such as timber in construction, is also beneficial. Every cubic metre of wood that is used as a substitute for other building materials saves around 2 tonnes of CO_2. In the UK more extensive use of timber in this way could store 10 million tonnes of carbon (equivalent to 37 million tonnes of CO_2) by 2020.

The increasing use of trees as a source of renewable energy – woodfuel – has a further substantial contribution to make. By replacing fossil fuels, sustainably produced woodfuel could reduce CO_2 emissions by as much as 7 million tonnes per year within 5 years[4].

Not surprisingly, therefore, the Forestry Commission actively encourages tree planting in both urban and rural areas to support the fight against climate change.

Tempering severe weather

The capacity of trees to attenuate water flow reduces the impact of heavy rain and floods and can improve the effectiveness of Sustainable Urban Drainage Systems[5].

Moderating temperatures

Through a combination of reflecting sunlight, providing shade and evaporating water through transpiration, trees serve to limit the 'urban heat-island' effect[6].

Trees moderate local microclimates – urban areas with trees are cooler in summer and warmer in winter[7] and can help to alleviate fuel poverty. Well-positioned trees also improve the environmental performance of buildings by acting as a buffer or 'overcoat', reducing thermal gain in summer.

"Trees are a key part of our armoury to combat climate change"

4

3

TREES MAKE A SIGNIFICANT ENVIRONMENTAL CONTRIBUTION

Adding to biodiversity

Trees enhance biodiversity[8]. A mature oak can host up to 5,000 different species of invertebrate that will form the basis for a healthy food chain that benefits birds and mammals. As a platform for biodiversity trees can link pockets of wildlife that, in time, helps to increase it and thus bring people closer to nature[9].

Improving air quality

Local air quality is improved as trees cut the level of airborne particulates[10] and absorb nitrogen dioxide, sulphur dioxide and ozone.

Growing sustainability

Environments with trees are more robust. Water quality is improved[11] as trees act as natural filters. The root systems of trees also counter soil erosion[12] and thus keep absorbed carbon locked in. Together these factors mean landscapes with trees are more likely to last – especially as some trees can live for many hundreds of years.

Transforming appearances

Most people enjoy seeing and being amongst trees. The inclusion of trees in developments can transform the appearance of sites for the better and create a more diverse and pleasing environment[13].

"Trees mean a more robust countryside with enhanced flora and fauna"

Environment

Economic

TREES CAN ADD DIRECT AND INDIRECT VALUE TO ANY AREA

Providing profitable by-products

Urban trees provide a range of different by-products – from small amounts of timber, to mulch and, of course, fruit. Plus, in rural areas there is the growing importance of woodfuel, with its capacity to contribute significantly to local economies.

Contributing indirectly to local economies

Then there are the many ways in which trees can indirectly contribute[14]. The positive impact of broadleaved woodland on property prices is well known, with increases in property values ranging from 5 – 18%[15]. The larger the trees are then the greater their proportional value.

Industrial areas and employment sites with access to natural greenspace can have more productive employees[16]. They tend to have greater job satisfaction too[17]. Retail areas with trees perform better than shopping centres without them, as customers are found to spend both more time and money![18] The tourist attraction of wooded areas is widely acknowledged with many local economies benefiting significantly[19].

As a consequence of all of these contributions, commercial and urban areas with good tree cover tend to attract higher levels of inward investment[20].

Reducing greenspace management costs

Greenspace with good levels of tree cover is proven to be much less costly to maintain than grassed areas[21].

Asset management

Trees should be seen as assets as they contribute substantial development asset value (see 'Calculating trees value' on page 23).

> "Trees create and sustain community wealth"

BREADTH OF BENEFITS FROM TREES

Delivering substantial health benefits

The presence of trees often encourages people to exercise, thereby reducing the incidence of heart attacks and Type 2 Diabetes[22]. Trees absorb considerable quantities of airborne pollutants and the resulting cleaner air cuts asthma levels[23].

Wooded environments are known to calm people, relieve stress and provide a spiritual value that supports improved mental health and wellbeing[24]. When they can see trees from their beds, patients' recovery times are faster as well[25].

The general health dividend provided by trees has been scientifically proven – Dutch research shows neighbourhoods with good tree cover are, statistically speaking, significantly healthier than less green urban areas[26]. The positive benefits of trees do not stop there. Because they provide increased shade, the risk of skin cancer in tree-covered areas should be lower[27].

Contributing to urban living

Some of the positive contributions from trees to urban living conditions were noted above. In addition trees near to buildings can improve home energy efficiency[28]. Where there are trees, pedestrian safety at crossing points is improved[29]. Also, as trees baffle sound, traffic noise levels are cut[30]. Crime is reduced where streets are 'greened'[31]. Finally, visually unappealing aspects or features can be hidden from view by trees.

Creating community spirit

Family and community environments are much more harmonious and closely knit where the urban setting includes trees[32]. A sense of place and a feeling of pride in surroundings are also heightened.

Enhancing education

The superior educational value of 'green' classrooms is now widely accepted[33]. There is also evidence to suggest that students perform better in premises where plants are present[34].

"Trees strengthen and improve people's lives"

THE MULTIPLE VALUE OF TREES FOR PEOPLE AND PLACES

Increasing greenspace and tree numbers is likely to remain one of the most effective tools for making urban areas more convivial:

Category	Benefit	Details
Climate change contributions	Countering climate change	• Trees remove CO_2 to create a carbon sink • Trees provide significant low-carbon options for building and energy
	Tempering severe weather	• The capacity of trees to attenuate heavy rains and floodwater slows run-off and renders Sustainable Urban Drainage Systems more effective
	Moderating temperatures	• The ability of trees to evaporate water, reflect sunlight and provide shade combine to cut the 'urban heat-island' effect
Environment advantages	Valuable aesthetic contributions	• More attractive landscape • Eye-sores hidden • Greener more natural • Linking town to country
	Cutting soil erosion	• Preserves the valuable soil resource and keeps carbon locked in
	Positive impact on water quality	• Trees act as natural filters
	Contributing to wildlife	• Increased biodiversity as countryside becomes more porous with extra links • Brings wildlife closer to people
Economic dividends	Providing profitable by-products	• Firewood/woodchip • Compost/leaf litter mulch • Renewable fuel – via coppicing • Timber • Fruit – community orchards
	Reducing greenspace maintenance costs	• Trees are much less maintenance intensive
	Contributing indirectly to local economies	• People more productive • Job satisfaction increased • Jobs created • Inward investment encouraged • Retail areas with trees perform better • Increased property values • Adds tourism and recreational revenue
Social benefits	Delivering a range of health benefits	• Cleaner air means less asthma • Lower risk of skin cancer • Quicker patient recovery times • Reduced stress • Positive impact on mental health and wellbeing • Encourages exercise that can counteract heart disease and Type 2 Diabetes
	Assisting urban living	• Improves buildings' energy efficiency and can help alleviate fuel poverty • Improved protection in winter • Increased pedestrian safety • Baffles noise • Moderated micro-climate • Increased CO_2 absorption • Reduced crime levels
	Adding to social values	• More harmonious environments • Heightened sense of pride in place • Greater community cohesion
	Offering spiritual value	• Heightened self esteem • Puts people more in touch with Nature and the seasons • Symptoms of anxiety, depression and insomnia alleviated
	Benefiting education	• Concentration increases in 'natural' classrooms • Better learning outcomes

Illustrating the benefits of trees

The many ways in which trees perform valuable roles in developments are demonstrated by the following case studies.

These cases cover a spectrum of contexts for development and Green Infrastructure projects – from city centres out to rural areas:

URBAN		
City centre	St John's Garden, Westminster, London
Urban area	London's street trees
Suburban woodland	The Queen's Inclosure, Havant, Hants
Peri-urban	Waterhayes, Newcastle-under-Lyme, Staffs
Rural context	Theydon Bois, Essex
RURAL		

URBAN

RURAL

CITY CENTRE
St John's Garden, Westminster

Trees' value: Quality of place is considerably enhanced by retaining dominant established trees.

- Central London's St John's Garden was redeveloped by Westminster City Council in 2001.

- Retention of the London Plane trees in this garden development buffered the noise of traffic from near-by streets.

- It also counteracted the stark symmetry of the surrounding buildings to instil a sense of the natural world into a dominant cityscape.

- A people-friendly setting was created that attracts workers and schoolchildren.

- The London Plane has proved tolerant to pollution and drought.

- The Plane's root systems have not affected the surrounding buildings' foundations or triggered subsidence.

- During the landscaping programme, extreme care was taken around the trees so as not to damage the Planes' root systems.

A people-friendly context that naturally attracts, and is jammed at lunch times on sunny days with workers and schoolchildren as they soak up the calm this tree-dominated space delivers.

| Environmental advantages	Improved biodiversity; aesthetic enhancements
Economic dividends	Employee productivity increased; property values in surrounding areas improved
Social benefits	Quality of life enhanced; stress reduced; a health dividend with reduced noise levels and locally improved air quality

URBAN AREA
London's street trees

Trees' value: Street tree planting can counteract the impact of climate change.

- A programme of street tree planting was part of the London Plan – Spatial Development Strategy[35].

- The London Plan is multi-faceted and, as part of an urban greening programme, there is an extensive tree-planting project.

- Over the next forty years millions of trees will be planted in London's streets.

- Based on the results of research by Manchester University, a 10% increase in the Capital's tree cover could reduce the city's surface temperature by 3-4 °C[36].

- To identify the optimum regime to adopt, a range of urban greening programmes will be tried and variations in temperature reduction outcomes will be noted.

Trees in London already enhance quality of life and, in time, will help to limit the impact of climate change too.
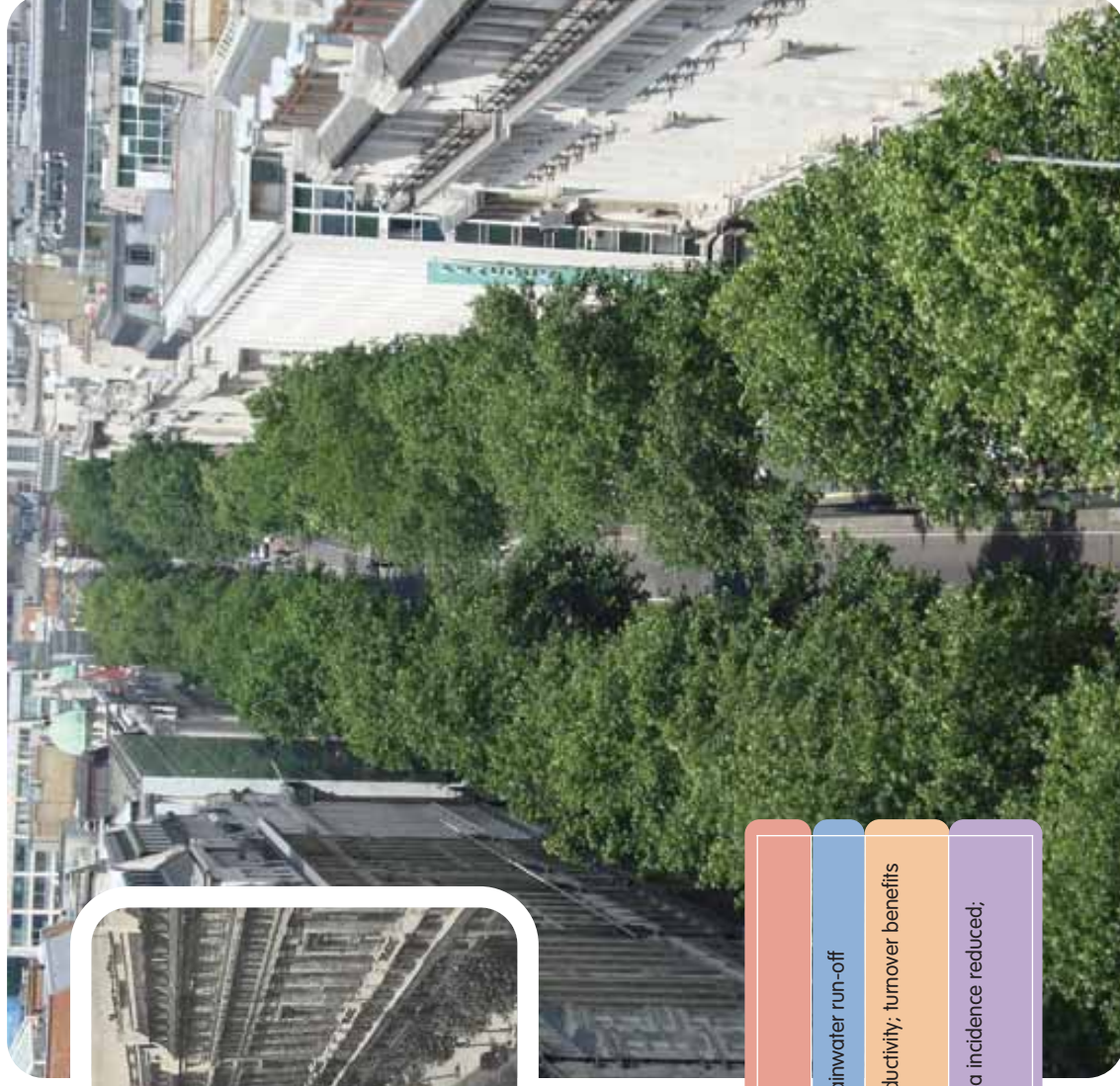
Kingsway 'before' (1950) and 'after' (2008)

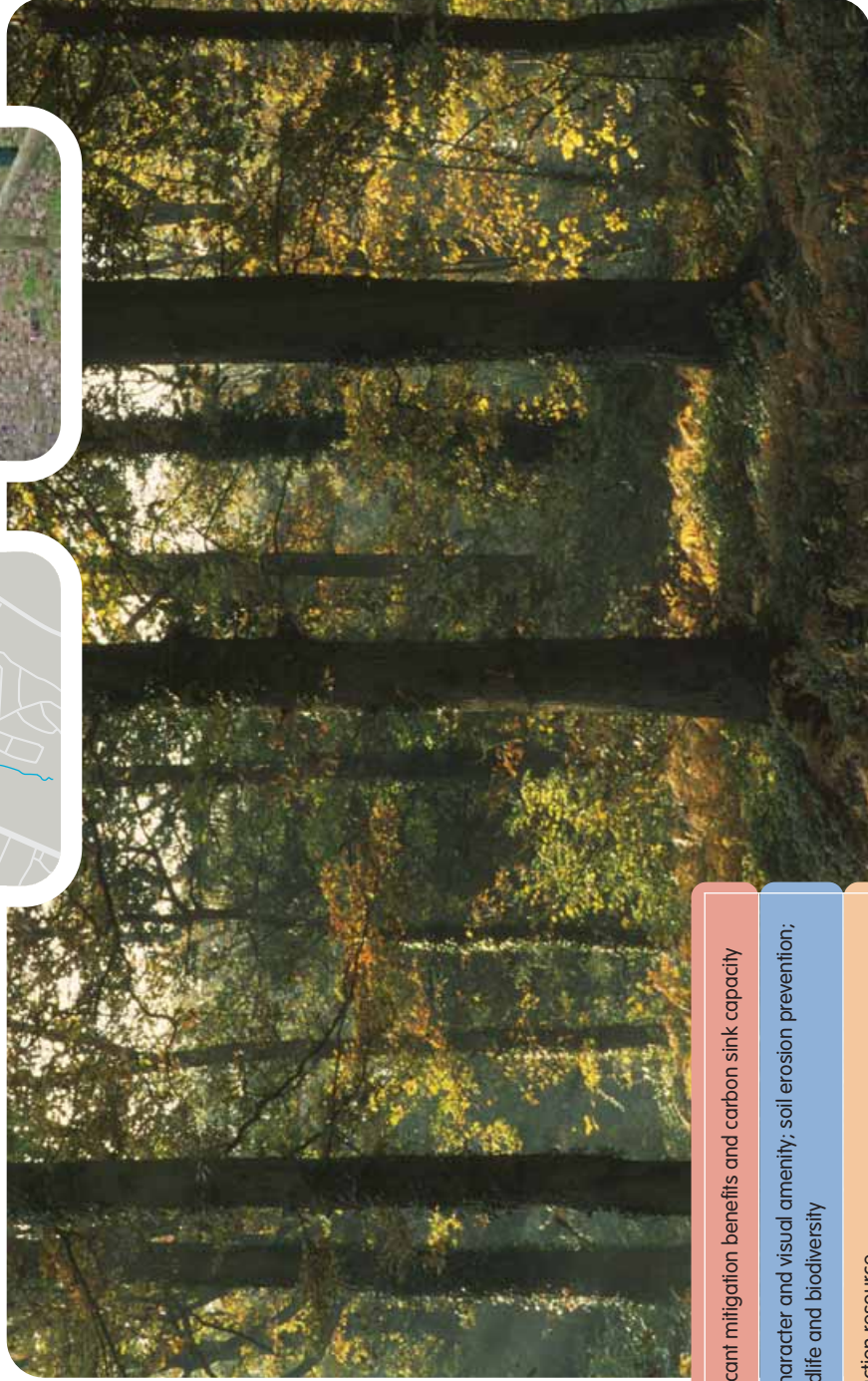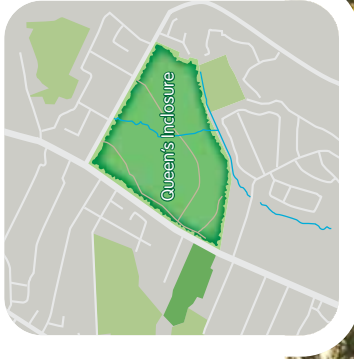| Climate change contribution | Significant adaptation benefits |
Environmental advantages	Landscape character contributions; attenuation of rainwater run-off
Economic dividends	Enhanced centres of employment improve staff productivity; turnover benefits for retail outlets
Social benefits	Quality of life better; air quality improved and asthma incidence reduced; traffic noise lower

URBAN

RURAL

SUBURBAN WOODLAND
The Queen's Inclosure, Havant

Trees' value: Preservation of relict woodland delivers significant biodiversity and amenity value contributions.

● Dating from the 1880's, the Inclosure in Havant is a 40 ha woodland containing tracts of both Ancient Semi-Natural Woodland (ASNW) and modern plantations.

● It is an intrinsic part of a wider infrastructure project to connect and enhance woods across Hampshire.

● The Forestry Commission's management of the site is complex as it has overlapping objectives to:

- enhance biodiversity
- protect archaeological features
- improve access for residents
- maintain significant timber production

A genuinely productive landscape that is also a valued pocket of the countryside, considerably enhancing its urban surroundings.

Queen's Inclosure

Climate change contribution	Locally significant mitigation benefits and carbon sink capacity
Environmental advantages	Landscape character and visual amenity; soil erosion prevention; haven for wildlife and biodiversity
Economic dividend	Timber production resource
Social benefits	Health and wellbeing; sense of place

PERI-URBAN
Waterhayes, Newcastle-under-Lyme

Trees' value: Increased amenity value by retro-planting trees and woodland, plus improved biodiversity and reduced maintenance costs.

- 1990s housing estates had been created with a 'green desert' around them and token tree planting.

- The contribution of the grassed areas to the local residents' quality of life was deemed low and the on-going cost of traditional bulk grass-cutting was high.

- The Borough's 'Trees not Turf' scheme was in response to these twin problems. This scheme aimed to establish 11 publicly accessible woodlands around the estates concerned.

- Waterhayes was one such estate. It is a 17.5 ha site on which 6.2 ha of woodland was planted in two phases.

- Areas for walking and playing games were provided amongst the meadows and trees.

Through the support of the Forestry Commission's English Woodland Grant Scheme (EWGS) this area was improved ecologically, its amenity value substantially increased and the cost of maintenance considerably reduced.
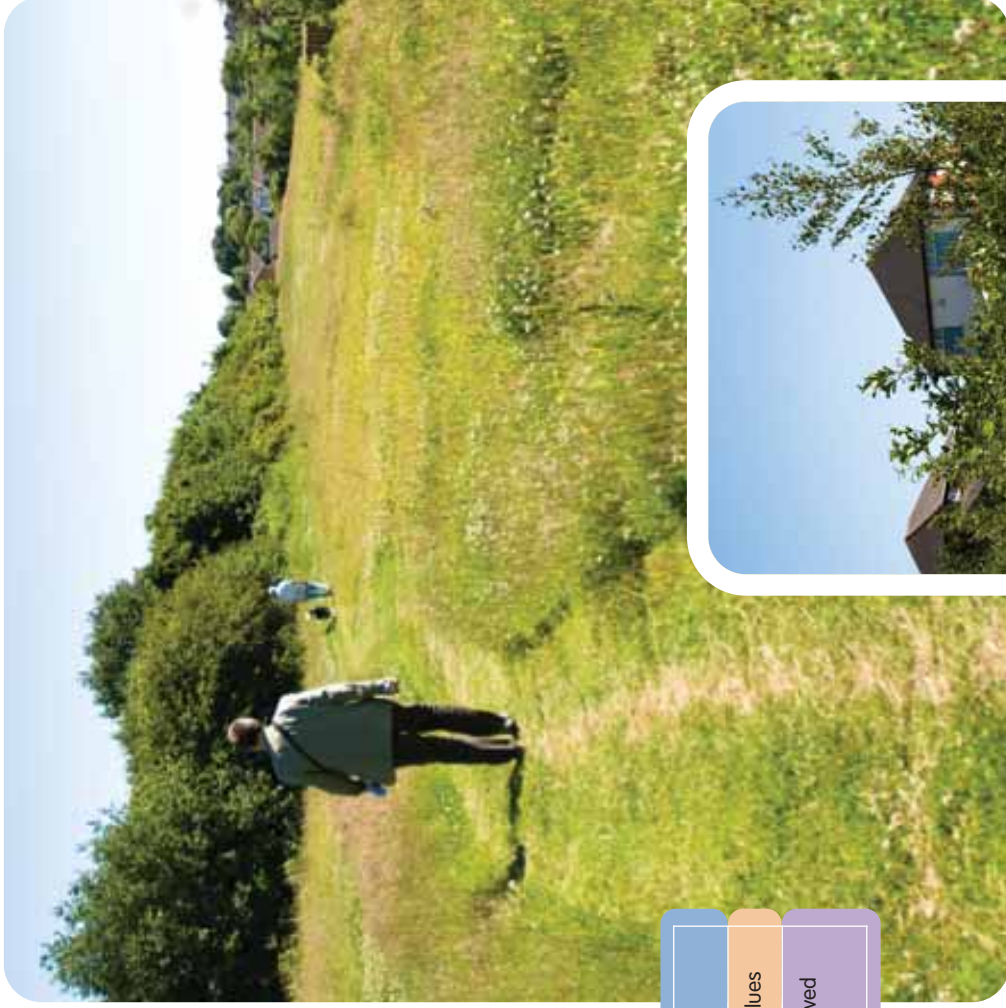
Environmental advantages	Improved biodiversity; aesthetically enhanced landscape
Economic dividends[37]	Reduction in on-going maintenance costs; improved property values
Social benefits	Quality of life enhanced; stress reduced; a health dividend achieved with reduced noise levels and locally counteracted pollution

URBAN

RURAL

RURAL
Theydon Bois, Essex

Trees' value: To create desirable environments for people that also serve as natural networks facilitating wildlife connectivity.

● The Woodland Trust purchased 38 ha of arable land on the edge of the M11 in 2006.

● With support from the Forestry Commission's EWGS the Trust planted over 50,000 trees, installed 2.5 km of recreational trails and created a multi-functional greenspace for local residents to enjoy.

● This development represented one aspect of the GreenArc's[38] landscape vision and was part of its efforts to connect the ancient forests of Hainault and Epping.

● Substantial wildlife corridors were created to act as buffers for this ancient woodland.

The project has improved access and is likely to make a significant contribution to biodiversity and moderating the impact of climate change in the area.
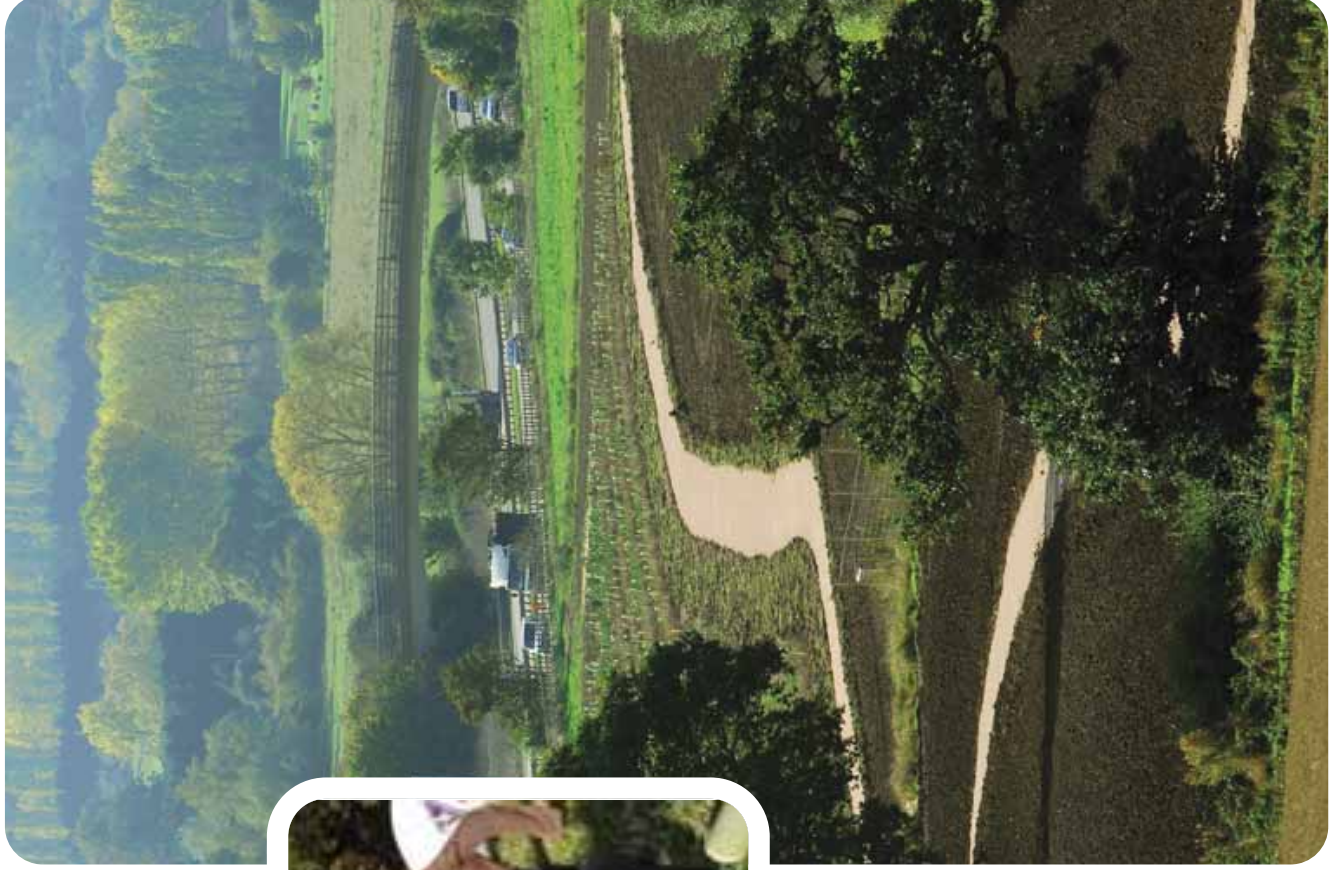

Climate change contribution	Significant mitigation benefits and carbon sink capacity
Environmental advantages	Improved biodiversity; aesthetically enhanced
Social benefits	Quality of life enhanced; stress reduced; a health dividend secured with added exercise opportunities, plus reduced noise levels and locally counteracted pollution

Trees and planning – National Level

The potential contribution of trees to development projects is considerable. As has been shown, their value is not confined to moderating climate change or sustaining the environment. There are also economic dividends and a substantial social dimension-gain available too. Thus any development project that includes trees provides numerous benefits, which increase with the use of larger trees and greater canopy cover. As a result trees and woods feature extensively in UK planning statutes.

This table shows the substantial contribution trees can make to national Planning Policy objectives. Yet the value that trees bring to places is vulnerable, often overlooked and opportunities to introduce them into projects missed. This table also demonstrates that planning for trees should be a priority:

The national planning policy backdrop

Legislation	Statutes relating to trees
The Town & Country Planning Act 1990	Part 8 (Special Controls), Chapter 1 (Trees): Section 197 – when granting planning permissions planning authorities are to preserve and plant trees
	Sections 198-202 – Tree Preservation Orders (TPOs) defined
	Sections 203-205 – TPO compensation
	Sections 206-210 – legal consequences of TPO removal specified
	Sections 211-214 – trees in conservation areas
	Section 300 – Crown land disposal and TPOs
	Note: the Forestry Commission is a statutory consultee for Local Planning Authorities in the case of mineral site restoration and aftercare
The Planning Compensation Act 1991	Part 1, sub-chapter 'Controls over particular matters' – Section 23 – substitutes Section 207 of the Act above concerning consequences of TPO removal
The Town & Country Planning (Trees) (England) Regulations 1999	These regulations make provision for the form of TPOs and applications to carry out work on them
The Planning & Compulsory Purchase Act 2004	Part 7, Chapter 1, sub-chapter 'Trees', sections 85 & 86 are substitutions for sections 200 & 211 of the 1990 Act concerning Crown activity featuring TPOs and trees in Conservation Areas
The Planning Act 2008	Part 9, Chapter 2, sub-chapter 'Trees', sections 192 & 193 amend sections 198, 199, 201, 202 and 203-205 of the 1990 Act relating to TPOs
The Town & Country Planning (Trees) (England) (Amendment) Regulations 2008	These 2008 regulations amend the 1990 Regulations to provide the use of the 1APP to apply for TPO consent
The Forestry Act 1967 (as amended)	Part 1, Section 1 sets out the statutory basis of the Forestry Commission; Section 2 covers constitutional matters; Section 3 management of Forestry land of which Part 2 includes the legislative provision for tree-felling Note: wherever planning has been granted there is no immediate requirement for a felling licence for the purpose of undertaking the actual development
The Climate Change Act, 2008	The world's first legally binding long-term framework to cut carbon emissions. It also creates a framework for adapting the UK to climate change, plus the role of trees to support such adaptation

Policy requirements

The policy context and planning framework is presently evolving. Nevertheless, the comprehensive list of policy requirements outlined in this table makes it plain that the role of trees in development is substantial, varied and likely to remain so:

	Objectives in relation to trees
Government policy documents	
• The Coalition: Our programme for government[39] • Conservative Liberal Democrat Coalition Negotiations: Agreements reached[40] • Building the big society[41] • Queen's Speech 2010, to both Houses of Parliament[42] • Budget 2010[43]	The need to plant trees, protect and enhance greenspaces and wildlife corridors and promote renewable energy (including woodfuel) is stressed. There are aims to reduce urban density to make space for trees in urban areas, whilst the resulting pressure for development in the countryside increases the important role of woods and forests as development mitigation
Forestry policy documents	
The UK Forestry Standard	This strategy and regulatory framework acknowledges the importance of urban woodland
A strategy for England's trees, woods and forests	Trees and woods in development and Green infrastructure are regarded as an important community resource that instils a sense of place
Keepers of time: A statement of policy for England's ancient and native woodland	It is important that development protects existing ancient woodland and increases native woodland cover. Accordingly development proposals and strategies must ensure trees contribute to quality of life, sustainable development, wildlife and biodiversity, plus cultural heritage and landscape
PPS:	
1. Delivering Sustainable Development	Trees alleviate the impact of climate change through carbon sequestration and local climate regulation. Trees also improve air quality
Supplement to PPS 1: Planning & Climate Change	Trees have a fundamental role in climate change resilience and for conserving biodiversity
3. Housing	The need for access to GI networks for sustainable communities is fundamental. Trees have a key role to play in this provision
4. Planning for Sustainable Economic Growth	Trees contribution to environmental, social and economic sustainability objectives is considerable and their presence on development sites can help attract inward investment and thereby increase an area's prosperity
5. Planning for the Historic Environment	Trees, woods and forests are fundamental elements of the historic environment, which contributes hugely to a sense of place
7. Sustainable Development in Rural Areas	Trees improve environmental quality and enhance public access, as well as ensuring development and Green Infrastructure is sensitive to countryside character in rural areas
9. Biodiversity & Geological Conservation	Trees contribute to habitat connectivity and retention/planting projects enhance a site's biodiversity
22. Renewable Energy	Promotes the use of renewable energy resources – woodfuel has substantial potential in this respect
23. Planning & Pollution Control	Trees serve a valuable mitigating role for polluted land and can be a significant component of land remediation projects
25. Development & Flood Risk	Trees' attenuation of water contributes to the integrity of functional floodplains and can improve the effectiveness of Sustainable Urban Drainage Systems (SUDS)
PPG:	
2. Green Belts	Trees and woods in the urban fringe contribute significantly to landscape, historic, biodiversity and recreational values
17. Planning for Open Space, Sport & Recreation	Woodland and urban forests provide considerable public benefit. The Forestry Commission holds valuable data to support Local Planning Authorities in the preparation of PPG17 assessments

Trees and planning – local level

Model policies:
Whilst both legislation and policy are constantly subject to change, there are some constants that need to be born in mind:

Legend:
- Urban area
- Key existing Accessible Natural Greenspace
- Key potential access corridor
- Other potential access route
- Potential green corridor project
- Potential area-wide project

Model policy – the landscape-scale Haven Gateway in the East of England, alert to creating a network of green infrastructure in the sub-region.

Local Development Frameworks

Given the volume of legislation on trees and woods, the significant and varied roles they can play across a wide range of planning policy objectives and their vulnerability to development, there is a need to adopt measures to protect or increase the area of tree canopy in Local Development Frameworks (LDFs).

It is now a statutory requirement that every LDF incorporates an outline of a local authority's Green Infrastructure intentions, as the Haven Gateway proposals illustrated here exemplify. Naturally LDFs also need to reflect the relevant woodland strategy or forest framework.

In principle, the Forestry Commission's minimum policy objective is that development ought, through Green Infrastructure provision, to lead to an increase in tree canopy cover by 5%. An excellent exemplar that could be used to develop policy within LDFs is the London Plan referred to in the 'street trees' case study (page 13 above).

The consultation draft replacement Plan of October 2009 reflects the objectives of the 'Tree and Woodland Framework for London'. This replacement Plan promotes the guiding principle of 'right tree, right place' that takes into account the context within which a tree is to be planted and addresses the issue of planting species appropriate to expected future climates. The Plan is also aligned with the environment programme for the Capital 'Leading to a Greener London', which includes targets for Green Infrastructure and tree cover.

Chapter five of this Plan relates to climate change and policy 5.11 considers urban greening and sets out support for it, including tree planting and Green Infrastructure. It suggests development proposals should integrate GI from the outset and major development proposals should identify how targets will be met. Chapter seven is entitled 'living spaces and places' and policy 7.21 relates to trees and woodlands, emphasising the requirement to protect, maintain and enhance trees and woodlands and states that existing trees should be retained and any loss resulting from development should be replaced[44].
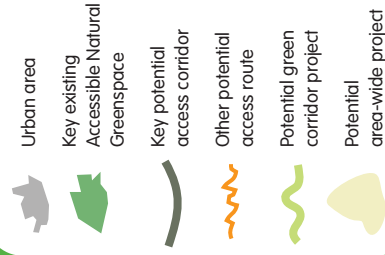
Comprehensive Tree and Woodland Strategies

Such strategies perform a variety of functions. Ultimately they may become a material consideration in planning applications, they could also serve managerial and/or perform communications roles.

A local authority's tree and woodland strategy could be adopted as a Supplementary Planning Document (SPD) so that it could then be part of its LDF. Once formally adopted, tree strategies constitute a material consideration in the determination of planning applications.

Such strategies need to cover all aspects of trees and woods in an area, providing details as to:

- policy direction and
- management action plans

These strategies should not only specify the maintenance of the existing tree stock to high standards, but also commit to the planting of new trees, along with the provision of trees in new developments. Thus they could involve pursuing:

- increased canopy cover
- greater provision of large trees

On the communications front it is helpful if they additionally:

- advocate tree planting
- outline good practice standards for both tree planting and aftercare
- contain a valuation of the local authority's tree stock (see page 23 below)

Finally, a comprehensive tree and woodland strategy should be regarded as a distinct strategy but, at the same time, be linked with all other relevant local strategies, such as open/ greenspace, play, transport and climate change.

In practice tree and woodland initiatives are extremely varied. In the case of the South Cambridgeshire District Council's 'Trees and Development Sites Supplementary Planning Document'[45] this topic specific SPD forms part of the South Cambridgeshire LDF. This initiative is a policy document confined to guiding the use of trees in development proposals (as the District's new settlement, Cambourne amply demonstrates).

Being topic specific this Cambridgeshire SPD does not constitute a full strategy, as it does not cover the District's entire tree stock, which a typical full tree strategy should. By way of a contrast the London Borough of Islington's Tree Strategy[46], which is widely cited as best practice, offers a comprehensive trees and woodlands policy. This strategy describes the baseline situation and identifies current management challenges for the Borough's Tree Department. While Council-owned trees are the primary focus of the strategy, there is some reference to the management of privately owned trees through the planning process, tree preservation orders and conservation areas. Public involvement is additionally encouraged through a tree sponsorship scheme

The Islington Tree Strategy relates well to the Borough's strategies for sustainability, climate change and biodiversity. Also, the Borough holds an inventory of the tree stock and is working towards allotting each tree a CAVAT score (see page 23 below).

The London Plan encourages each Borough to produce its own comprehensive tree strategy covering the audit, protection, planting and management of trees and woodland.

Model policy – a mosaic of housing and greenspace at Cambourne in South Cambridgeshire.

Trees and planning – practicalities

Development Management checklist
Translating policy into reality – as every site is different we confine ourselves here to overviewing some practical requirements in the form of a checklist of tips and key regulations:

1 ✔ Planning application process

Trees and woods need to be considered from the start of the planning application process:

a. Pre-application discussions

The Planning Advisory Service points to a number of benefits arising from incisive pre-application discussions. These include:

● Avoiding incomplete applications that cannot be registered

● Reducing the number of unsuccessful planning applications

● Saving time and money

● Avoiding confrontation

● Raising the quality of developments

● Gaining community acceptance

When making provision for trees in development projects it is vital that pre-application opportunities are exploited.

Ideally, following the mandatory survey of existing trees (see step 2 opposite), trees are incorporated during the concept and design stage. The optimal level of tree canopy cover should also be envisaged at this time and, with the help of arboriculturists, the most appropriate trees can then be selected and sufficient infrastructure amendments made to allow them to grow to maturity.

Big is better

It is not simply a matter of tree provision, for it should be recognised that the selection of larger trees in developments bring proportionately greater benefits. Shade, shelter, water attenuation, improved air quality, biodiversity and aesthetic values are all increased. Therefore the provision of larger trees brings bigger benefits.

Use of ducts

The adoption of shared service ducts for utility apparatus is crucial. For in practice this decision not only leaves more room to accommodate larger trees in projects, but such ducting can contribute to sustaining the trees over time as well.

Early inclusion advantageous

Thinking about trees late on in the planning process, or after plans have been drawn up, often prevents the provision of larger trees. Also, by not planning for trees in advance, subsequent maintenance can prove to be more expensive.

b. Consultation

Local Planning Authorities have a statutory duty to consult the Forestry Commission for minerals and waste applications when an aftercare condition relates to forestry. The Infrastructure Planning Commission has a statutory duty to consult the Forestry Commission for all applications impacting on the protection or expansion of forests and woodlands. The Government recommends that the Forestry Commission should be consulted for applications affecting ancient woodland (when any part of the development site is ancient woodland, or is within 500 metres of ancient woodland), veteran trees and when minerals aftercare schemes are supported by Forestry Commission grants or include significant planting.

c. Determination

All planning applications for development are determined in accordance with the LDF, including Green Infrastructure (GI) intentions, policies for protecting existing trees and/or encouraging planting, unless there are material considerations. Where Forestry Commission guidance documents or policies are relevant, they are regarded as material.

d. Planning conditions and obligations

Planning conditions should require tree planting or protection of existing trees where appropriate. Planning obligations should ensure the provision of funds for GI.

2 ✔ The 1APP

The standard 1APP planning application form[47] requires trees or hedges on the proposed development site to be surveyed and a detailed tree condition assessment provided. Applicants are also asked to identify whether there are trees or hedges on land adjacent to the proposed site that could influence the development, or might be important as part of the local landscape character.

Where trees or hedges are on, or adjacent to the development site, the requirement to provide a full tree survey will only be met if it is compliant with British Standard 5837 (see step 6 right).

3 ✔ Tree Preservation Orders (TPO)

TPOs[48] protect trees for the benefit of public amenity, enjoyment and the environment. TPOs may apply to individual trees, groups of trees, areas or woods. TPOs prohibit the cutting down, topping, lopping, uprooting and wilful damage or destruction of the designated trees, without permission from the Local Planning Authority. Breach of a TPO is an offence.

4 ✔ Conservation Areas

Whilst focused on the historic value of the built environment, conservation areas also protect trees and woodlands. Trees in such areas over 7.5 cm in diameter cannot be felled, lopped or uprooted without making a Section 211 Notice to the Local Planning Authority[49]. Although this notice has no prescribed form, the applicant must identify the tree and detail the nature of the works. The authority then has six weeks to either serve a TPO or give notice to the applicant that they may proceed.

5 ✔ Tree felling licences

To help protect Britain's forests, a tree felling licence[50] is required from the Forestry Commission. Whether or not a TPO is in force, a licence is required if more than five cubic metres are to be cut (this might amount to one large tree), unless an exemption applies, for example, in certain locations, less than prescribed trunk diameters, or if trees are actually dangerous or are causing a nuisance.

6 ✔ British Standard 5837

BS 5837:2005[51] gives recommendations and guidance on the principles to be applied to achieve a satisfactory juxtaposition of trees, including shrubs, hedges and hedgerows, with structures.

Countering construction damage

Whatever trees are retained in development proposals, they must be protected from construction damage with fencing. Most tree root systems are within the top 600 mm of the soil, extending for distances that are frequently in excess of the height of the tree. So protective fencing will often need to cover a zone larger than the canopy area to avoid damaging compaction.

Calculating trees value

The need to estimate the value of a tree

Increasingly tree owners are recognising the need to value their tree stock[52], in much the same way as local authorities value their infrastructure and building stock, or developers their assets. By attaching a general value to trees they are then more likely to be included in development and properly looked after.

There are four methods[53] of achieving these outcomes:

1. CAVAT

A comparative study of valuation methods by the Tree and Design Action Group published in 2008 indicates that the most efficient way of dealing with large numbers of trees is the Capital Asset Value Amenity Trees method – or CAVAT for short.

● Developed in the nineties in the UK, the CAVAT system uses a hand-held scanner that can download direct to a database.

● A value for a tree is ascribed that has been predetermined by its size.

● The system then adjusts the tree's value according to a wide set of factors/benefits to provide a measure of the individual tree's value.

● CAVAT supplies a limited assessment of social/cultural values and, unlike any other system it factors in nature conservation and biodiversity.

● Usefully, there is also a quick method for assessing larger tree populations with less detail.

2. i-Tree

The second method, developed by the US Forestry Service, is called i-Tree.

● This computer-based system uses a module or sub-system called STRATUM that was specifically designed to assess large populations of street trees.

● Like CAVAT, i-Tree is also appropriate for valuing tree populations over wide areas.

● i-Tree offers a limited assessment of social/cultural value. Altogether it has the advantage of flexibility, detailed output and assessment of a wide range of benefits (although not as wide as CAVAT).

● While its output is automated it is not widely used in the UK, possibly because it requires more detailed input than CAVAT.

3. Helliwell

Despite being slower than the other methods, this manual system has been extensively used in the UK.

● Developed in the sixties in the UK, this method applies expert judgements, on a tree-by-tree basis, to estimate an individual tree's amenity value, expressed in pounds sterling.

● Helliwell does not consider environmental, social or cultural benefits.

● It seems best suited to single tree and small community evaluations or urban woodlands.

4. DRC

The second manual method is Depreciated Replacement Cost (DRC).

● Developed by the Council for Tree and Landscape Appraisers in the US, this approach is based on a recognised method of financial asset appraisal.

● To arrive at a final value for a given tree, this method uses a formula covering its various characteristics, condition and location.

● The formula's valuation is then corrected for depreciation.

Definitive values can be calculated

Whichever valuation method planners or developers choose, a rigorous measure of a tree's value can be calculated[54]. Once trees have been assigned recognised values, the need for retaining or planting new or replacement trees in developments becomes far more evident. That trees can increase in value as they mature may act as a further incentive for retention. Finally, it is also possible to use these methods to predict a tree's subsequent value at maturity and demonstrate how this might positively enhance a development's future resale value.

Trees and planning – enabling delivery

The Forestry Commission can contribute in many ways. For instance in the creation of appropriate local policy and, either directly and indirectly, to development projects. As is demonstrated below, the Forestry Commission has the skills and capability to directly create Green Infrastructure. Or, depending on a development's location and the manner in which trees are to be incorporated, a mix of expert advice and/or financial contributions can be made available to developments and greenspaces featuring trees:

Advice

Forestry Commission Woodland Officers can help with project development in a variety of ways. Usually trained as foresters, they can deliver a wealth of practical advice, such as how to avoid soil compaction from operations on site. Assistance with stock mixes and selection, planting and maintenance planning have also proved valuable over the years. They can draw on the resources of Forest Research[55] (the Forestry Commission's in-house research agency) and may be able to provide project support too.

Access to information

Wherever there is uncertainty about the significance or use of trees in a project, there is considerable public guidance and technical information freely available from the Forestry Commission.

The public can tap into a wide range of issues on the Forestry Commission's website. For instance, there is advice on the physical requirements for large species trees adjacent to buildings, ensuring both are able to co-exist, or which trees are most appropriate for each soil type, condition and situation.

Grants

Grant support is no less comprehensive. Funded by Defra under the Rural Development Programme for England (RDPE), funds are available from the English Woodland Grant Scheme[56] (EWGS). Whether it is to manage existing woodland, or create new woods, grants are available. In fact there is a suite of six woodland award schemes to support different types or aspects of development projects. Enhanced funding is usually available for projects close to large urban centres, as well as to those that deliver on other priorities, such as biodiversity or public access.

To qualify, the land and/or the developer needs to be registered and the project must be seen to meet national or regional objectives.

Availability varies by region, so it is also vital that the Forestry Commission website is consulted for the latest situation (www.forestry.gov.uk/ewgs). It should be noted that, over and above the general grant schemes, projects in certain target areas may qualify for further special funding.

GI delivery capability

As a result of extensive involvement over many years with Green Infrastructure the Forestry Commission has developed a comprehensive, 4-stage GI programme. This delivery mechanism not only transforms landscapes, but also lives[57].

Over the last decade the Forestry Commission's multi-disciplinary GI teams, drawn from hundreds of in-house specialists, have worked alongside numerous partners and communities to create almost 4,000 ha of new GI across England – to the benefit of hundreds of thousands of people.

The positive contribution this multi-disciplinary approach makes to people's quality of life is well understood. Further, the beneficial impact this GI can have on the environment and in locally countering climate change is readily acknowledged too. While the teams' growing emphasis on the development of productive landscapes is presenting the opportunity for a valuable economic dividend as well. The combined result is the creation of high quality, multi-functional, truly sustainable GI – transforming landscapes and lives[58].

References/links

1. The Forestry Commission is actively involved with the climate change issue and details of its various initiatives can be found at: www.forestry.gov.uk/climatechange See also 'Combating climate change – a role for UK forests. An assessment of the potential of the UK's trees and woodlands to mitigate and adapt to climate change. The synthesis report', Read DJ, Freer-Smith PH, Morison JIL, Hanley N, West CC, and Snowdon P (eds), The Stationery Office, Edinburgh, 2009. Both the synthesis and main science report are available from: www.forestry.gov.uk/readreport

2. A recent study of Kielder Forest's 150 million trees indicated they sequester 82,000 tonnes of carbon each year – so it is calculated that each tree is locking up 0.546kg of carbon annually, equivalent to 2kg of CO_2. A study by Lancaster University of trees in the West Midlands estimated that the total amount of carbon stored in trees within that conurbation represented the equivalent of three week's CO_2 emissions. Finally, in 'Forestry Matters', published by Forestry Commission Scotland are a number if interesting comparative examples of trees' capacity to store carbon in relation to typical energy usages, e.g. 5 cubic cm of Sitka spruce contains the same amount of carbon as would be emitted by a boiling kettle, while 6 cubic m of timber (i.e. a timber-framed house) is equivalent to driving an average petrol car for a year (11,000 miles).

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4. Data sourced from 'The UK Low-carbon Transmission Plan'. Although burning wood releases CO_2, this is offset by the additional CO_2 being absorbed by the new trees planted in place of those harvested as woodfuel. See also Forest Research's Wood Fuel Information Pack' available at: www.forestresearch.gov.uk/woodfuel

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9. 'Biodiversity by Design: A guide for sustainable communities' Town and Country Planning Association (TCPA), London, 2004; 'Coping with ADD – The Surprising Connection to Green Play settings' Taylor AF, Kuo FE, Sullivan WC, Environment and Behaviour 33 (1), pp54–77, 2001.

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34. Amanda Rend of the Royal College of Agriculture, UK found that plants in lecture halls had positive effects on students and noted that inattentive behaviour signs were much lower.

35. The Mayor's London Plan is a spatial development strategy that sets out an integrated economic, environmental, transport and social framework for the Capital's development over the next 20-25 years. Web link: www.london.gov.uk/thelondonplan

36. An investigation by Manchester University, as part of a wider programme of research into Adaptation Strategies for Climate Change in the Urban Environment (ASCCUE), focussed on the urban environment, assessed climate change impacts and developed and tested appropriate adaptation responses through spatial planning and urban design. Continuing investigation indicates that increasing tree cover by ten percent can reduce the surface temperature of a city by between 3-4°C thereby reducing the 'urban heat-island' effect.

37. The selection of more appropriate tree species can also present a productive landscape opportunity.

38. The GreenArc partnership's commitment is to: conserve the Green Belt and enhance its public use, landscape and wildlife; increase and expand the open space and green corridors available for public enjoyment across the area; protect and improve biodiversity and wildlife.

39. 'The Coalition: Our programme for government', Cabinet Office, May 2010

40. Cabinet Office, 11th May 2010

41. Cabinet Office, 18th May 2010

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43. Budget 2010, Return to an order of the House of Commons, 22nd June 2010

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54. In Appendix 2 of CABE Space's 'Making the invisible visible: the real value of park assets', published in 2009 are examples of tree valuations conducted in two UK parks. At Highbury Fields in Islington, using the CAVAT system, its 578 trees were valued in 2008 at £44,960,886. While in the same year 6,756 mature trees were valued, using the Helliwell system, at Sefton Park in Liverpool at £86,645,700.

55. Forest Research is a world leader in the research and development of sustainable forestry and Britain's principal organisation for forestry and tree related research: www.forestresearch.gov.uk

56. www.forestry.gov.uk/ewgs

57. View this mechanism at: www.forestry.gov.uk/GI-east

58. For a demonstration of this capability see: 'Transforming landscapes – transforming lives',Forestry Commission, 2010

Glossary

Ancient Woodland: Ancient Semi-Natural Woodlands are woods that have been part of the landscape since the Middle Ages, i.e. continuously wooded since at least 1600 AD. It is generally considered that a wood present in the 1600s was likely to have developed naturally on undisturbed soils.

Carbon sink: A forest acts as a carbon sink as long as it continues to effect a net transfer of carbon (in the form of CO_2) from the atmosphere to the forest.

Greenhouse gases: Any gas in the atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the 'greenhouse effect'. Common examples include water vapour, carbon dioxide, methane, nitrous oxide and ozone.

Green Infrastructure: While there are many different meanings of this term in circulation, the Forestry Commission subscribes to the following definition: Green Infrastructure is a network of multi-functional greenspace, both new and existing, both urban and rural, which supports natural and ecological processes and is integral to the health and quality of life of sustainable communities.

Landscape-scale: A holistic development approach over large areas potentially involving a number of projects. Such programmes are not confined to single issues but can embrace a wide range, including biodiversity, local economies and agriculture.

Low-carbon options: A wide range of products, services and practices that offer reduced carbon consumption opportunities.

Peri-urban: The urban fringe around the edges of towns and cities is a patchwork of multiple land uses, including housing, underutilised, derelict and agricultural land that can be converted into publicly accessible and valuable greenspace.

Productive landscapes: A term indicating an intention to derive some form of economic benefit from environmental/social landscapes.

Sequestration: The act of removing CO_2 from the atmosphere and (in the case of trees) storing it in biological material.

Sustainable Urban Drainage Systems (SUDS): A sequence of water management practices and facilities designed to drain surface water in a way that provides a more sustainable approach than the conventional practice of routing run-off through a pipe to a watercourse.

'Urban heat-island': A built-up area that is significantly warmer than less densely developed or rural areas surrounding it.

Forestry Commission
England

The case for trees

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Additional links

Forest Research – www.forestry.gov.uk/landregeneration

Sustainable Cities – www.sustainablecities.org.uk/public-space

TCPA – www.tcpa.org.uk

The London Plan, 'Trees and Development Sites Supplementary Planning' –
www.london.gov.uk/thelondonplan/spg-bpg.jsp

Further Reading

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'Delivery Plan 2008-2012 – England's trees, woods and forests',
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'Combating climate change – a role for UK forests', TSO, 2009

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