Trees & Design Action Group

No Trees, No Future

February 2010

Originally written by the Trees and Design Action Group, 2008
Edited by CABE and English Heritage, 2010

The full version of No Trees, No Future can be downloaded from the Trees and Design Action Group website: www.forestry.gov.uk/forestry/INFD-7KDEHU

Cover image: Chris Edwards. Cover design: Reduction

Trees & Design Action Group

CABE SPACE

ENGLISH HERITAGE

No trees, no future: trees in the urban realm

Contents:

Foreword

Chapter 1 Introduction
Chapter 2 Why urban trees are so important
Chapter 3 Why urban trees are under threat
Chapter 4 Putting a figure on the value of trees
Chapter 5 Incorporating trees into new developments
Chapter 6 Subsidence and risk: overcoming perceptions, preventing problems
Chapter 7 Trees and planning

Appendix
Trees and Design Action Group

Foreword

The Trees and Design Action Group (TDAG) was formed early in 2007. The driving force was a concern that we must act together and promptly if we are to protect and enhance the green legacy in our cities for ourselves and for future generations.

One key achievement of what is considered to be a unique group has been the consistent support of a very broad and growing membership of individuals and organisations which, from a wide range of viewpoints and interests, recognise the benefits and value of urban trees.

We have worked together to develop these guidelines under the title *No Trees, No Future: trees in the urban realm.* This was launched in November 2008 at the House of Commons with the aim of providing information and guidance for designers, developers and planners to encourage integrated, joined up thinking, strategies, policies and implementation relating to trees in the urban realm. The present document, the first of a series, includes inputs from the consultation period.

The group is currently preparing guidelines for *Trees in the Streetscape* and undertaking research for *Trees in Car-parks.* An RIBA Knowledge Community for *Trees in Urban Greening* has been established with Sir Terry Farrell as the Knowledge Champion and TDAG providing the supporting expert advice. The basis for the Knowledge Communities is that the most valuable resource we can all share is knowledge and it is hoped that all professional institutes and associations will work together to agree an integrated approach to protecting and promoting our urban trees.

Another significant step in the group's progress is seen in Policy 7.21 of the draft Replacement London Plan which advises Boroughs to take the *emerging work of the Trees & Design Action Group into account in producing LDF policies and determining planning applications.*

"Cost-benefit" analysis could be the vital link in increasing support for urban trees and promoting trees higher up the decision making agenda. Recent reports from New York showed that investing $1 per annum in trees can return $5 in quantifiable benefits. Work is underway to provide a methodology for cost-benefit analysis for conditions in the UK. The benefits that need to be analysed include environmental, social and economic benefits.

Trees offer a fascinating insight into looking at urban issues and challenges and it is rewarding to note how often trees appear to provide at least part of the solution.

The guidance set out by the Trees & Design Action Group is intended to inform decision making so that the right specimens of the right trees are planted in the right way in the right places and given the right aftercare and maintenance – trees can then truly be one of the urban realm's greatest allies.

Martin Kelly MA FLI FIHT FRSA
Managing Director, Capita Lovejoy and Chair Trees and Design Action Group
February 2010

Chapter 1

Introduction

In the last few years a growing body of research has made it clear that trees bring a wide range of benefits both 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, particularly from new building development and yet trees should be a key part of infrastructure planning and need to be given equal weight and value to grey infrastructure elements.

This report, supported by verified research relevant to the United Kingdom, explains why trees are so important to our well-being and to the future of our towns and cities and gives advice to ensure that trees are allowed to thrive while development takes place. It explains why it is vital that we protect and plant larger varieties of trees. It demonstrates that by incorporating trees into new development the financial, social and environmental value of the resulting place can be greatly increased.

This report should be of particular use to developers, builders, planners and architects. It aims to provide clear guidance, without an overwhelming amount of technical arboricultural detail. Where more detailed advice might be useful, it explains where this can be found.

Chapter 2

Why urban trees are so important

There is a growing body of evidence that trees in urban areas bring a wide range of benefits.

Economic benefits of urban trees:

- Trees can increase property values by 7-15 per cent[1] [2] [3].
- As trees grow larger, the lift they give to property values grows proportionately[4].
- They can improve the environmental performance of buildings by reducing heating and cooling costs, thereby cutting bills[5].
- Mature landscapes with trees can be worth more as development sites[3].
- Trees create a positive perception of a place for potential property buyers.
- Urban trees improve the health of local populations, reducing healthcare costs[6].
- Trees can enhance the prospect of securing planning permission.
- They can provide a potential long-term renewable energy resource [7].

Social benefits of urban trees:

- Trees help create a sense of place and local identity.
- They benefit communities by increasing pride in the local area[8] [9] [10].
- They create focal points and landmarks.
- They have a positive impact on people's physical and mental health[8] [9] [10].
- They have a positive impact on crime reduction[11] [12].

---

[1] *Influence of trees on residential property values in Athens, Georgia: a survey based on actual sales prices,* Anderson LM and Cordel HK, *Landscape and urban planning*, 1988
[2] *The contribution of trees to residential property value,* Morales DJ, *Journal of Arboriculture 6,* 1980
[3] *Does money grow on trees?* CABE, 2005
[4] *The London climate change adaptation strategy,* Greater London Authority, 2008
[5] *The potential of vegetation in reducing summer cooling loads in residential buildings,* Huang YJ, Akbari H, Taha H and Rosenfeld AH, *Journal of climate and applied meteorology 26,* 1987
[6] *Ecotherapy,* MIND, 2008 www.mind.org.uk/ecominds
[7] *A woodfuel strategy for England,* Forestry Commission, 2007
[8] *Trees and healthy living,* National Urban Forestry Unit conference, Wolverhampton, 1999
[9] *Green releaf,* Mudrak LY, *Environmental benefits of vegetation at a global, local and personal level: a review of the literature,* Horticultural Trades Association and Royal Botanical Gardens, Kew, 1982
[10] *Stress recovery during exposure to natural and urban environments,* Ulrich RS, Simmons RF, Losito BD, Fiority E, Miles MA and Zeison M, *Journal of environmental psychology 11,* 1991
[11] *A prison environment's effect on healthcare demands,* Moore EO, *Journal of environmental systems 11,* 1981-82
[12] *Environment and crime in the inner-city: does vegetation reduce crime?* Kuo FE and Sullivan WC, *Environment and behavior Vol 33 No.3,* 2001

Environmental benefits of urban trees:

- Urban trees reduce the 'urban heat island effect' of localised temperature extremes[13].
- They provide shade, making streets and buildings cooler in summer[3] [5].
- They help remove dust and particulates from the air[14] [15] [16].
- They help to reduce traffic noise by absorbing and deflecting sound.
- They help to reduce wind speeds.
- By providing food and shelter for wildlife they help increase biodiversity[17] [18] [19] [20] [21] [22] [23] [24].
- They reduce the effects of flash flooding by slowing the rate at which rainfall reaches the ground[25].
- When planted on polluted ground they help improve its quality.

Trees and climate change

As the effects of climate change become better understood, it is becoming increasingly clear that one of the best ways in which we can make our towns and cities more hospitable over the next few decades is to increase the number, and size, of trees in urban areas. Trees have been identified as being a key element of any urban climate change adaptation strategy[4] [26]

In England, climate change is likely to bring higher average temperatures and increasing incidents of sudden, heavy rain. Already, our cities have higher temperatures than the rest of the country due to the urban heat island effect. As the effects of climate change increase, the temperatures in our cities are likely to become more difficult to live with. In addition, sudden heavy rainfall on built-up areas will be increasingly likely to overwhelm drainage systems resulting in flooding.

---

[13] *Adapting cities for climate change: the role of the green infrastructure,* Gill SE, Handley JF, Ennos AR, and Pauleit, S, *Built Environment 33,* 2007
[14] *Particulate pollution, Forest research,* 2007
[15] *Trees and sustainable urban air quality: using trees to improve air quality in cities,* Stewart H, Owen S, Donovan R, Mackenzie R, Hewitt N, Skiba U and Fowler D, Lancaster University 2003
[16] *Urban woodland and the benefits for local air quality,* Broadmeadow MSJ and Freer-Smith PH, *Amenity trees 5,* HMSO, 1996
[17] *The number of species of insect associated with British trees: a re-analysis,* Kennedy CJ and Southwood TRE, *Journal of animal ecology 53,* 1984
[18] *Bird life of woodland and forest,* Fuller RJ, Cambridge University Press, 1995
[19] *Dead wood matters: the ecology and conservation of saproxylic invertebrates in Britain,* Kirby KJ and Duke CM, *English Nature Science 7,* 1993
[20] *Saproxylic invertebrates and their conservation,* Speight MCD, *Nature and environment series 42,* Council of Europe, 1993
[21] *Handbook of British mammals,* Corbet GB and Harris S (eds), Blackwell Scientific Publications, 1991
[22] *The city as habitat for wildlife and man,* Stearns F, in *Urbanisation and environment,* Detwyler R and Marcus MG (eds), Duxbury Press, 1972
[23] *Avian guild structure and habitat associations in suburban bird communities,* De Graaf RM and Wentworth JM, *Urban ecology 9,* 1986
[24] *Cities as environments,* Botkin DB and Beverage CE, in *Urban ecosystems 1,* 1997
[25] *Loss of trees increases storm water runoff in Atlanta,* Soltis D, *Water engineering and management 144,* 1997
[26] *A strategy for England's trees, woods and forests,* Defra, 2007

Trees, however, can help with both problems. By providing shade for buildings and streets, and allowing water to evaporate through their leaves, they reduce the local environmental temperature. When it rains, tree canopies slow the rate at which water reaches the ground. This slows the rate at which the water enters the drains, giving them more time to carry away the water and so reducing the likelihood of flooding. This can be particularly effective as part of a sustainable urban drainage system (SUDS).

Consequently, it is becoming increasingly understood that trees will be an important ingredient in creating successful towns and cities of the future. This is now starting to influence urban development policy at both national and local levels.

Why bigger is better

The benefits that trees bring to urban areas are proportionate to their size: in general, large, mature trees bring more benefits than small ones. They provide more shade and shelter, and catch more rain in their leaf canopies. However, in urban areas, our large, mature trees are under threat, while the new trees being planted tend to be smaller varieties. This is happening for a range of reasons — including misperceptions about the risk of subsidence — outlined below. One of the key problems, however, is that when planning a new development, trees are usually one of the last considerations. By then, it is usually too late to retain any existing mature trees or create an environment suitable for planting new large species trees.

Chapter 3

Why urban trees are under threat

Recent research has shown that all over England urban trees are under threat. An investigation by the London Assembly highlighted the loss of street trees in the capital and the fact that large species trees are being cut down faster than they are being replaced[27]. This is not just a problem for London. Research commissioned by the Government found a similar situation all over the country[28]. This project looked at the entire urban realm, from streets and estates through to parks and private gardens. In particular, it highlighted the threat to trees from built development in all its forms.

This situation is largely caused by two factors:

- Large urban trees are often perceived to be a cause of buildings subsidence and other risks. The perception of risk is far greater than the reality, as will be discussed in chapter 6.
- Although national and local policy now tends to encourage planting trees in urban areas, the way that new development is delivered often makes it impossible to accommodate larger trees. Ways of overcoming this are outlined in chapter 5.

In addition, some people dislike urban trees because of the mess or slippery surfaces caused by leaves or fruit falling; because of the 'honeydew' associated with some species that can form a sticky layer on cars; or because they can block light. Most of these problems can be overcome by choosing the right species of tree for the location, by good tree management, or by helping people appreciate the wider benefits that urban trees deliver. This will be discussed further in chapter 6.

[27] *Chainsaw massacre: a review of London's street trees,* London Assembly environment committee, 2007
[28] *Trees in towns II: a new survey of urban trees in England and their condition and management,* Britt C and Johnston M, *Amenity trees 9,* Communities and Local Government, 2008

Chapter 4

Putting a figure on the value of trees

For many years local authority tree officers resisted trying to value the tree stock they managed as they were sceptical about how such valuations might be used. However, it is now increasingly recognised that if an asset is not ascribed a monetary value it is often perceived as having no value at all. For instance, when it comes to setting budgets for maintaining assets, it could seem wasteful to spend money maintaining an asset that, on the balance sheet, is worth nothing. Consequently, it is now widely recognised that in order to help people recognise the importance of trees, and allocate appropriate budgets for planting and maintaining them, it is sensible to try to put a figure on their value.

One of the problems in ascribing financial values to trees is that they can be beneficial to individual people, and to society, in so many very different ways — as outlined in chapter 2. The three different methodologies described, (currently being used in the UK), attempt to capture the value of trees in different ways and so will be useful in different situations. However, none of them effectively quantifies the biodiversity value[29], or social and cultural value of trees. Of the three, the CAVAT method is the only one that attempts to include the value that trees bring to people's wellbeing.

The three methods use different types of assessment, and different sorts of calculations, and so the values they assign to a particular tree will not be the same. Consequently, depending on the situation, it may be advisable to ensure that all parties agree which valuation method should be used before attempting to value the trees.

Despite the imperfections of the valuing systems, they can be extremely useful. For instance, by quantifying the value that trees will bring to a development, designers and developers could offset the cost of providing trees against the benefits that they will add. In addition, the future value of a mature landscape could be calculated to help market a new development to potential purchasers.[30]

---

[29] The concept of valuing ecosystem services provided by trees is becoming more widely appreciated. See *An introductory guide to valuing ecosystem services,* Defra, 2007

[30] *It should be noted therefore that trees have an asset value in their own right and can increase in value. This is an incentive to successfully take trees from nurture through to independence and maturity and affects the way that existing trees should be considered on development sites. In the USA and notably New York City, work has been undertaken to analyse the cost-benefit analysis of trees. It is anticipated that an appropriate methodology will be developed for the UK so that economic, environmental and social benefits of urban trees.*

Capital asset value for amenity trees (CAVAT)

CAVAT is a relatively new method, but is now recommended by the London Tree Officers Association as the best way to value street tree stock. It was devised by Chris Neilan, landscape officer for Epping Forest district council, and first published by the London Tree Officers Association in 2007. It is generally used for valuing publicly owned trees to establish their value to the community. It is also used for establishing the value of trees in structural damage claims so that site investigations are commensurate with the value of the tree. This has been agreed with the insurance industry through the *Joint mitigation protocol*[31].

CAVAT uses a calculation of tree replacement cost based on the average surface area cost of trunk per square centimetre. Unlike other tree valuation methods, it also includes a value that aims to represent the social value of the tree. This is based on something called the 'community tree index', that is derived from population density statistics, on the assumption that the value the tree brings to the local community is commensurate with the number of people there are in the local community to interact with it. The baseline figure is index linked and then used in conjunction with the trunk diameter to arrive at a figure for the value of the tree. This is then adjusted by various factors such as the tree's crown size and life expectancy.

Unlike the other valuation methods described below, CAVAT can be applied in two ways. There is a detailed assessment method for calculating the value of an individual tree, and a less detailed method for assessing the value of large-scale tree populations. For more information about CAVAT see www.ltoa.org.uk/cavat.htm.

Helliwell method

This method was invented by Rodney Helliwell in 1967 for the Tree Council and is probably the best-known method for valuing trees and woodlands. It has been used extensively by planning authorities, and in courts, and it was updated in 2008. It is generally used for putting a value on individual trees.

The Helliwell[32] method calculates a monetary value following an assessment of the tree. Various factors such as location, size, form, condition, and so on are given values and multiplied

[31] *Joint mitigation protocol*, London Tree Officers Association, 2008
[32] Aboricultural Association (2000) *Guidance Note 4: Amenity Valuation of Trees & Woodlands.*

according to a formula. The tree is given a value that is index linked to ensure it remains up-to-date.

CTLA method

This was developed by the USA's Council of Tree and Landscape Appraisers (CTLA) in 1957. It is based on methods of asset appraisal normally used for valuing physical infrastructure or building stock. It is generally used for establishing the value of the tree to its owner, particularly valuing multiple trees in private ownership.

Because this method is based on a traditional way of valuing physical assets it includes an element of depreciation. This is because many physical assets — for instance computers, vehicles, structures — become less valuable as they age. Consequently, it is standard practice when valuing physical assets to include an element of deprecation in the calculation. However, trees and landscapes tend to become more valuable as they mature and so including depreciation could result in a significant under-valuation[33].

[33] *For more information about this problem see Making the invisible visible: the real value of park assets, CABE, 2009*

Case study 1

Arlington business parks - profiting from trees and green infrastructure

Arlington Securities built its £800 million business park portfolio by creating business premises set in high quality green space in order to achieve premium rental values. It consistently devotes 25-30 per cent of its sites to communal parkland and designs to rules that convey a brand identity through landscape.

For each new development Arlington prepares a masterplan that lays down building plots, densities, landscape, car parks and infrastructure zones. The entire development is planned before any buildings have been started or any tenants have been signed up. The communal landscaping for the whole development is competed before the first tenant moves in. High quality green space is vital to every Arlington masterplan and the soft landscape component represents between 0.8 per cent and 2 per cent of the total build cost on a plot.

Actions

- A masterplan is prepared for each site, specifying building plots, densities and landscape.
- An area equivalent to 25 per cent of the plot area of all buildings must be devoted to green space.
- The company works closely with landscape consultants, landscape architects and nurseries.
- Trees are grown off-site in advance and replanted so that mature trees are incorporated at the outset of each new development.

Achievements

- Arlington business parks command city centre rental values.
- Rental income quadrupled within four years to the end of 2002.
- Business tenants contribute service charge towards costs of maintaining green spaces.
- Large species structural trees are incorporated at the outset of development.

Lessons learned

- Having 25-30 per cent of the plot as high quality landscape can dramatically raise rental income.
- Accessible green infrastructure, whether composed of structural trees, open space, or a combination of both, helps create premium commercial properties.

Case study 2

Canonbury Park South — how trees enhance housing value

A quick survey of London suggests that the most desirable and valuable parts of the capital in property terms are also the places that have the most mature trees. The link between high property values and the presence of trees is one that the developers of this housing scheme were keen to exploit. The local planning authority worked with the developers to ensure they achieved a high quality landscape. A variety of innovative and cost-effective amendments were made to the design and construction of the housing to allow better protection for trees that were already growing on the site and also to enable successful planting of the large species trees necessary to retain the character of the area.

Actions

- Pre-application meeting between developer and local authority.
- Robust interpretation of tree retention policies.
- Pre-application site visit between tree officer and developer to demarcate tree protection zones.
- Building footprint agreed in principle prior to planning application.
- Foundation design (raft, and pile and beam) agreed in principle prior to planning application.
- Replacement tree species agreed in principle prior to planning application.
- Regular on-site supervision of tree protection measure during construction phase.

Achievements

- Retention of prominent large species structural trees on site.
- Construction of building foundations able to accommodate second generation large species tree planting if retained trees are removed during life-time of building.
- Amendments to the design of vehicle access ramps to lower level garages to protect root zones of established trees.
- Design of walls and planters amended to accommodate newly planted large species trees.
- Effective communications, increased knowledge base and trust developed between all participants that continued into subsequent projects.

Lessons learned

- Engagement on tree issues must be undertaken at the earliest opportunity eg the conceptual and design stages.
- Expert arboricultural advice should be obtained at these stages of the scheme as well as during development and implementation.
- Construction phase site-supervision inspections by the tree officer are essential.

Chapter 5

Incorporating trees into new developments

National and local policy increasingly recognises the importance of large trees in urban areas, yet often it is impossible to incorporate them into new developments because the layout or services have not been designed to accommodate them.

For instance, if a building's foundations are built to the minimum possible specification in order to save money, or if utilities are installed separately — which results in a lot of underground space becoming unavailable for tree planting and root growth — it can be impossible to find a suitable place in a development in which to plant a larger species tree. In addition, highway sight lines, lighting, signage and CCTV cameras are often designed and installed without taking into account the presence of trees. Often, trees are considered to be far less important than these other aspects of the development and so are then left out.

If the local council has a tree strategy (see chapter 7), this should help ensure that the importance of trees is recognised in the development process. A compromise may have to be reached between the various elements of infrastructure — including large trees — that form the development as a whole, and a tree strategy will help ensure that trees do not lose out in the negotiations.

In high density developments there may be less room for tree roots and canopies, although space can often be found along boundaries, or adjacent to paths, or in areas of public open space.

Where land values are particularly high, developments often have large basements with areas of public space above them. In this sort of situation it may be possible to find an area at the edge of the development where trees could be planted at the outset, and where they will be able to find space for root growth. However, often in these sorts of development the trees are semi-permanent and only last for the life-time of the development itself.

Guidelines for incorporating trees into new developments:

- Plan for trees at the earliest stages of design.
- Refer to, and adopt, relevant local strategies such as the green space / open space strategy; biodiversity action plan; climate change strategy or action plan; tree strategy;

play strategy. These strategies will often include standards for the quantity and accessibility of green space, such as Natural England's accessible natural green space standard (ANGSt)[34].

- Carry out a survey of existing trees, if any, so that where possible they can be incorporated into the new development.
- Identify the optimal tree canopy cover for the development and consider layout, orientation and design details to allow for this.[35]
- Remember that large species will grow to have large canopies and extensive root networks. Take advice about how to position them so that they have sufficient room to grow. You should consult an arboriculturist and built environment professionals to advise about preventing conflicts between the tree's root system, underground services and building foundations.
- Ensure the engineering requirements to accommodate tree planting in relation to building foundation design are complied with. For instance, on clay soils foundations should be designed from the outset with a view to accommodating the expected size at maturity of the tree species planted. .
- Wherever possible underground services should be routed in shared service ducts. This requires early stage co-ordination between various organisations. Ducts make maintenance easier and ensure that services do not take up so much space that there is no room for tree roots. Modern utilities in plastic ducting can tolerate deformation by tree roots in ways that older services cannot. National Joint Utilities Group guidance[36] strongly advises that there should be effective forward planning for trees, and recommends that tree planting should be part of development so that trees and utilities can co-exist successfully.
- Get professional help from an arboriculturist in choosing appropriate species and ensuring that their physiological needs are engineered into the scheme. Information about the types of trees that will survive in London and other urban areas in England can be found at www.right-trees.org.uk.
- Avoid having to retrofit trees into an already designed development: by this stage it may be too late to incorporate larger species.
- Trees are living organisms and need care to ensure they survive. If existing trees are retained, it will be important to ensure that they are not damaged during the construction process. If new trees are introduced, care must be taken with planting, care after

[34] See: www.naturalengland.org.uk

[35] Optimal canopy cover relates to local context and capacity. Currently canopy cover is at the forefront of strategies for urban cooling as part of climate change adaptation strategies. Work by Professor John Handley and Dr Roland Ennos at the University of Manchester have indicated that a 10% increase in canopy cover will climate proof Manchester up to a 4 degree C rise in temperature. Establishing a methodology for assessing optimal urban canopy cover is the subject of ongoing research.

planting, and long-term management. Guidance for good practice is published by the British Standards Institution[37] and the national building specifications[38].

- If the built infrastructure is designed to accommodate trees, expensive maintenance such as heavy pruning should not be needed often. If possible, funding for tree care should be built into planning permissions through management plans and section 106 agreements.

Case study 3

Accordia - retaining mature trees to create award-winning housing

This innovative housing scheme, close to the centre of Cambridge, was awarded the 2008 Stirling Prize for architecture and commended for the innovative way in which it incorporated trees. More than 700 mature trees were retained as part of the development, and supplemented by additional planting. The site, which was formerly government offices and second world war pre-fabricated structures, now contains housing designed by three different architectural practices, Feilden Clegg Bradley, Maccreanor Lavington, and Alison Brooks Architects. Although the housing is built to relatively high densities, the quality of the open spaces, play areas and street design — and the incorporation of so many mature trees — has created an exceptional living environment.

Actions

- Retention of prominent large species structural trees on site.
- Significant contribution to the principles of climate change adaptation through urban greening.
- New tree planting providing shade and amenity for residents.

Lessons learned

- Engagement on tree issues must be undertaken at the earliest opportunity, eg at conceptual and design stages.
- Expert arboricultural advice should be obtained at these stages of the scheme as well as during development and implementation.
- Be clear at the outset about which trees should be retained.
- Construction phase site-supervision inspections by the tree officer are essential.

[36] *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees,* National Joint Utilities Group, 2007

[37] *Recommendations for tree work,* BS3998, British Standards Institution, 1989; *Trees in relation to construction*, BS5837, British Standards Institution, 2005

Chapter 6

Subsidence and risk: overcoming perceptions, preventing problems

One of the underlying reasons why urban trees are under threat is that many people believe they cause a range of problems. This section considers whether or not these perceptions are realistic, and outlines ways in which potential problems can be avoided.

Subsidence

There is a very common perception that urban trees are the major cause of buildings subsidence. This view is held by members of the public, but also within the insurance industry, which can lead to requests that trees near buildings are cut down before a mortgage is agreed, or that new developments do not include trees. Consequently, the *perception* that trees cause subsidence is a major threat to urban trees[27].

In fact, the incidence of subsidence in urban areas that is caused by trees is far lower than assumed. One study in a London borough found that only 0.05 per cent of its building stock was affected by tree-related insurance claims annually.

In areas where the subsoil is not shrinkable clay the risk is minor. However, it is true that in built up areas on clay soil, during times of drought, trees occasionally cause foundation movement to structures. It is also the case that foundations can move some time after the removal of large trees near the building. These types of foundation movement are likely to increase — whether or not trees are present — as the effects of climate change increase.

Consequently, on shrinkable soils new buildings should be designed and built with foundations that are adequate to withstand the potential affects of subsoil movement. This can be done by following the relevant building standards and professional advice and will help to protect the buildings against the predicted effects of climate change, as well as from potential difficulties with tree roots. In addition, professional advice should be sought when planting trees to ensure that appropriate species are chosen for the location. Finally, the trees should be maintained properly.

---

[38] See: www.thenbs.com

The risk of trees or branches falling down

It is clearly important that trees and branches do not fall on people — however, they are remarkably resilient and very rarely collapse without clear signs beforehand.

Trees are susceptible to damage, disease and decay, both natural and man-made. Usually, problems such as dead wood, broken or hanging branches, movement at the base of a tree, or areas of decay with fungi, can be spotted by a lay observer. If a tree professional is then called in, they will be able to solve the problem, usually without removing the whole tree.

Light obstruction and shade

A common complaint about trees is that they obstruct light or create too much shade. This can be prevented by ensuring that appropriate species are selected when planting, and for mature trees, maintaining them and thinning them if necessary.

As the effects of climate change increase, the shade provided by trees is likely to become more valued as is their contribution to reducing the urban heat island effect.

Leaf litter and fruit fall

Although leaves on the ground are disliked by many people, and by local authorities, they are now often collected and used to create locally sourced compost. Blocked gutters and drains can be avoided by fitting mesh guards.

As fallen fruit can be slippery on paths, it is important to be careful where fruit-bearing trees are planted. However, in some urban areas fruit bearing trees are increasingly valued for their contribution to local food growing schemes.

Honeydew

Honeydew is a sticky substance that is produced by aphids feeding on trees such as limes and sycamores. It is occurs in warm summer weather and results in an unpleasant sticky coating on cars parked beneath the trees.

Although it can be annoying, honeydew has a very beneficial effect in that it traps dust and particles and so helps reduce airborne pollution[14]. Honeydew can be avoided by planting aphid-resistant species.

Trees obstructing footpaths

In places where there are wide-girthed trees growing on narrow footpaths pedestrians can have trouble passing by. This situation can be avoided by ensuring that there is adequate space for the species selected to grow to maturity, and that the planting pit is designed and built to allow for some root expansion in the future.

Where trees have already grown too wide for a path, it might be possible to build the path out into the road so that pedestrians can go round the tree trunk. Alternatively, it might be possible to have non-structural surface roots removed.

Chapter 7

Trees and planning

The policy context

There are numerous references to the importance of providing, and protecting, trees and landscape throughout government planning guidance[39], contained within government circulars[40], planning policy guidance and planning policy statements. These high-level policy documents are supported by a wide range of good practice guidance published by central government and agencies such as the Commission for Architecture and the Built Environment (CABE)[41], the Forestry Commission[42] and Natural England[43].

Circular 11/95 recommends that a planning authority should require full details of proposed landscape designs, including detailed specifications, methods and design drawings relating to tree retention, site preparation and new planting, to be approved. Separately, it states that these should be implemented fully in accordance with the approved details prior to occupation. This recognises that quality control of materials and operations is vital when dealing with live plants.

Circular 11/95 also sets out model conditions for requiring the approval of proposals for maintenance and the aftercare of newly planted landscape areas. It advises on the need for management plans to be prepared, submitted and approved to ensure that the long-term design objectives of the landscape and tree planting are properly considered at the outset. Management plans provide valuable information for future owners or occupiers of a development and a mechanism for enforcement by the local planning authority if they are not adhered to.

Local authority planning powers

Local planning authorities have a range of powers to require trees to be planted, retained, protected and managed — but these are not always fully used or enforced.

There is a statutory duty for a local planning authority[44], *'to ensure, whenever it is appropriate, that in granting planning permission for any development adequate provision is made, by the*

[39] See: www.communities.gov.uk/planningandbuilding
[40] Notably *Circular 11/95: the use of conditions in planning permissions,* Communities and local government, 1995
[41] See: www.cabe.org.uk
[42] See: www.forestry.gov.uk
[43] See: www.naturalengland.org.uk
[44] Under section 197 of the *Planning act*, 1990

imposition of conditions, for the preservation or planting of trees'. It is also a duty of the authority, when it considers it necessary, to make tree preservation orders (TPOs) on such trees. In addition, a TPO may be made in respect of trees that are to be planted in the future, subject to their size, this TPO taking effect as soon as the tree is planted. Local authorities can also make a TPO on any tree, or trees, that have a significant impact on their surroundings, particularly where this may be endangered. It is a criminal offence to damage or remove a protected tree.

If trees are already present on a site, the planning authority can refuse to register a planning application unless it is accompanied by a detailed tree condition survey. Local planning authorities can, and do, routinely impose conditions on planning permissions requiring the approval of details for the protection of existing trees, generally quoting the need to comply with British Standard 5837 and for any tree works to comply with the recommendations of British Standard 3998[37]. They may also require details of proposed services, foundation designs and method statements to be submitted and approved where there is a risk that these might conflict with existing or new tree plantings.

Proposed works that might affect trees within a designated conservation area must be notified in writing to the local planning authority. The authority then has six weeks in which to decide whether to take action, such as issuing a TPO.

Tree strategies

Trees in towns II[28] highlights the importance of local authorities having a comprehensive tree strategy that covers all the trees and woodlands held on both public and private land in the authority's area.

With the introduction of local development frameworks and supplementary planning documents, local authority tree strategies should be of increasing importance. They provide the detail, in terms of policy direction and management action plans, which were formerly contained in unitary development plans. The tree strategy, or a summary of it, should be a supplementary planning document that informs the local development framework. Once formally adopted by the local authority, a tree strategy will be a material consideration in the determination of planning applications.[45]

---

[45] Policy 7.21 of the draft Replacement London Plan advises Boroughs to take the emerging work of the Trees & Design Action Group into account in producing LDF policies and determining planning applications.

Tree strategies should integrate policy making and implementation in local authorities. They should establish the case for more, and better informed, provision for trees in new developments, including:

- increasing canopy cover;
- ensuring that buildings and infrastructure can accommodate large trees;
- setting out references to good practice standards for tree planting, aftercare and management;
- engaging land and property owners and the wider public in supporting tree planting and good tree management in both public and private spaces;
- the valuation of the local authority's tree stock in all the represented land-use forms.

Ideally they should incorporate a commitment from the local authority — and other public realm owners — to plant new trees and to maintain existing stock to high standards.

Tree strategies should improve communication about trees between stakeholders. The absence of a tree strategy is a serious impediment to effective policy delivery. Tree Strategies should all be adopted as SPDs and be properly integrated with a range of strategies including Open/Green Space, Play, Transport, Climate Change Adaptation and Biodiversity strategies as well as strategies relating to housing and education. You should liaise with the local planning authority for further information on adopting tree strategies.

Short development cycles shorten tree lives

Many sites — in particular those for commercial buildings — now have relatively short development cycles and are sometimes redeveloped every 30 years or so. One consequence of this is that even if large species trees are planted on the site they may not survive redevelopment.

Local planning authorities should strengthen protection for trees on development sites through TPOs, tree strategies or policies, and by enforcing planning conditions. This means carrying out adequate site surveys to ensure that existing trees are protected and that proposed new trees can actually be planted and sustained in the long term.

If no trees exist on a site, opportunities should be sought to plant trees that will become the structural trees of the future.

Newly planted trees forming part of a landscape plan required under planning conditions should be protected by TPOs rather than simply by relying on the planning condition to ensure their long-term retention.

Case study 4

Queen Square, Bristol – the value of reinstating green infrastructure

Bristol's Queen Square was a originally a fine Georgian square of townhouses surrounding a tree-lined green. However, in the 1960s a dual carriageway was built diagonally across the square as part of a new inner-city relief road. By that time, many of the houses had been split into multiple occupancy and business use, and this — coupled with the major increase in traffic and loss of the green — resulted in the square declining. In 1993 the council decided to try to revive Queen Square and re-routed the dual carriageway. Then in 1998 a successful Heritage Lottery Fund bid provided £3.68 million for a programme of improvements to the square and its green.

Since the traffic has been removed and the green re-instated, property prices in buildings around the square have increased to the extent that they are now 16 per cent higher than similar properties elsewhere.

Actions

- Diverting the road and restoring the green.
- Restoration of footpaths around and across the square.

Achievements

- Safeguarding the square intact for future generations.
- Retaining large species structural trees.
- Adding an average 16 per cent premium to the value of properties overlooking the square.

Lessons learned

- Well designed, well maintained green infrastructure can add significant value to urban properties.

Case-study 5

St George's Avenue - negotiating to keep a large urban tree

When people build extensions to their homes the new building can often cause problems for nearby trees. If the trees are not even on the same site as the building, but are, for instance, in a neighbouring garden, they may not even be considered as part of the planning application. Ideally, however, they should be: consideration of the effects of development on trees on adjacent land should take place in just the same way as if the trees were on the site itself. This is just what happened at a site in St George's Avenue, Islington, London, when the owner of a Victorian end-of-terrace house approached the local authority with a view to building an extension. The proposed two-storey extension, to the side of the house, would have required the removal of a tree growing on the adjacent site, which was owned by the local authority. Following a site visit and negotiations with the developer, it was agreed that a two-storey extension was unacceptable, but that a single-storey extension, that would allow the tree to remain, could win approval if built under strict tree protection planning conditions.

Actions

- Pre-application meeting between developer and local authority.
- Robust interpretations of tree retention policies.
- Pre-application site visit between the tree officer, developer and their engineers to demarcate tree protection zones and agree tolerances for boundary wall construction.
- Building footprint agreed in principle prior to planning application.
- Foundation design (raft) agreed in principle prior to planning application.
- Regular on-site supervision of tree protection measures during construction phase.
- Planning conditions stipulating tree retention and foundation design.

Achievements

- Retention of prominent large species structural tree on adjacent site.
- Construction of building foundations able to accommodate second generation large species tree planting if retained tree is removed during lifetime of building.

Appendix

Trees and Design Action Group

This document has been published by the Trees and Design Action Group (TDAG), a multi-disciplinary group of professionals and organisations, from the public and private sectors, that collaborate to achieve an increased awareness of the role of trees in the built environment.

TDAG initially focused on London, under the *London tree and woodland framework* (GLA, 2005). However, TDAG's research is equally applicable to other cities, and experience and research from other cities inform its work.

TDAG is concerned with all trees, both existing and proposed, in the urban environment. Although there is a considerable amount of guidance for built environment professionals about the desirability of protecting and planting urban trees, for a variety of reasons — many outlined above — too often the reality is that smaller, less substantial trees are planted rather than larger species. The aim of this document is to help address this problem, to ensure that larger urban trees are protected and planted. If this does not happen, we risk creating harsh urban landscapes that are unable to mitigate the predicted effects of climate change.

For more information about the Trees and Design Action Group see our website, hosted by the Forestry Commission, at: www.forestry.gov.uk/tdag